

MBS MacCF Plugin Documentation

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0.1 Introduction

This is the PDF version of the documentation for the Xojo Plug-in from Monkeybread Software Germany.
Plugin part: MBS MacCF Plugin

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Chapter 5

Accessibility

5.1 module AccessibilityMBS

5.1.1 module AccessibilityMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: A class to handle all the global stuff of the Accessibility API.

Notes: This class has a lot of CFStringMBS functions to return you constants. Please check Apple's documentation about those constants.

If you miss a function or a constant, please email.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 13.5pr7](#)
- [MBS Xojo / Real Studio Plugins, version 13.4pr1](#)
- [MBS Real Studio Plugins, version 13.0pr9](#)
- [MBS Plugins 11.1 Release notes](#)
- [MBS REALbasic Plugins, version 11.1pr6](#)

5.1.2 Methods

5.1.3 ApplicationAXUIElement(pid as Integer) as AXUIElementMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The AXUIElement for the current application.

5.1.4 Available as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: True if the Accessibility API is available.

Notes: Should always be true on Mac OS X 10.2.

5.1.5 AXAPIEnabled as boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: True if the user permits Accessibility services.

5.1.6 IsProcessTrusted(Prompt as Boolean = false) as boolean

Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

Function: Returns whether the current process is a trusted accessibility client.

Notes: Added prompt flag for version 18.1.

5.1.7 kAXAllowedValuesAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.8 kAXAMPMFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.9 kAXApplicationActivatedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.10 kAXApplicationDeactivatedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.11 kAXApplicationDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.12 kAXApplicationHiddenNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.13 kAXApplicationRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.14 kAXApplicationShownNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.15 kAXAscendingSortDirectionValue as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: A constant used for the AXUIElement class.

5.1.16 `kAXAttributedStringForRangeParameterizedAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.17 `kAXBoundsForRangeParameterizedAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.18 `kAXBrowserRole` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.19 `kAXBusyIndicatorRole` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.20 `kAXButtonRole` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.21 `kAXCancelAction` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the `AXUIElement` class.

5.1.22 kAXCancelButtonAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.23 kAXCellForColumnAndRowParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.24 kAXCellRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.25 kAXCheckBoxRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.26 kAXChildrenAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.27 kAXClearButtonAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.28 `kAXCloseButtonAttribute` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the `AXUIElement` class.

5.1.29 `kAXCloseButtonSubrole` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.30 `kAXColorWellRole` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.31 `kAXColumnCountAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.32 `kAXColumnHeaderUIElementsAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.33 `kAXColumnIndexRangeAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.34 kAXColumnRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.35 kAXColumnsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.36 kAXColumnTitleAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.37 kAXColumnTitlesAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.38 kAXComboBoxRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.39 kAXConfirmAction as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.40 kAXContentListSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.41 kAXContentsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.42 kAXCreatedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.43 kAXCriticalValueAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.44 kAXDateFieldRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.45 kAXDayFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.46 kAXDecrementAction as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.47 kAXDecrementArrowSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.48 kAXDecrementButtonAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.49 kAXDecrementPageSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.50 kAXDefaultButtonAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.51 kAXDefinitionListSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.52 kAXDescendingSortDirectionValue as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: A constant used for the AXUIElement class.

5.1.53 kAXDescription as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.54 kAXDescriptionAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.55 kAXDialogSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.56 kAXDisclosedByRowAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.57 kAXDisclosedRowsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.58 kAXDisclosingAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.59 kAXDisclosureLevelAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.60 kAXDisclosureTriangleRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.61 kAXDockExtraDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.62 kAXDockItemRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.63 kAXDocumentAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.64 kAXDocumentDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.65 kAXDrawerCreatedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.66 kAXDrawerRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.67 kAXEditedAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.68 kAXEnabledAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.69 kAXExpandedAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.70 kAXFilenameAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.71 kAXFloatingWindowSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.72 kAXFocusedApplicationAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.73 kAXFocusedAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.74 kAXFocusedUIElementAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.75 kAXFocusedUIElementChangedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.76 kAXFocusedWindowAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.77 kAXFocusedWindowChangedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.78 kAXFolderDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.79 kAXFrontmostAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.80 kAXGridRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.81 kAXGroupRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.82 kAXGrowAreaAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.83 kAXGrowAreaRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.84 kAXHandleRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.85 kAXHandlesAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.86 kAXHeaderAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.87 kAXHelpAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.88 kAXHelpTagCreatedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.89 kAXHelpTagRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.90 kAXHiddenAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.91 kAXHorizontalOrientationValue as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: A constant used for the AXUIElement class.

5.1.92 kAXHorizontalScrollBarAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.93 kAXHorizontalUnitDescriptionAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.94 kAXHorizontalUnitsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.95 kAXHourFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.96 kAXImageRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.97 kAXIncrementAction as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.98 kAXIncrementArrowSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.99 kAXIncrementButtonAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.100 kAXIncrementorAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.101 kAXIncrementorRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.102 kAXIncrementPageSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.103 kAXIndexAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.104 kAXInsertionPointLineNumberAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.105 kAXIsApplicationRunningAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.106 kAXIsEditableAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.107 kAXLabelUIElementsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.108 kAXLabelValueAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.109 kAXLayoutAreaRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.110 kAXLayoutItemRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.111 kAXLayoutPointForScreenPointParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.112 kAXLayoutSizeForScreenSizeParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.113 kAXLevelIndicatorRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.114 kAXLineForIndexParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.115 kAXLinkedUIElementsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.116 kAXListRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.117 kAXMainAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.118 kAXMainWindowAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.119 kAXMainWindowChangedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.120 kAXMarkerTypeAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.121 `kAXMarkerTypeDescriptionAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.122 `kAXMarkerUIElementsAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.123 `kAXMatteContentUIElementAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.124 `kAXMatteHoleAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.125 `kAXMatteRole` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.126 `kAXMaxValueAttribute` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the `AXUIElement` class.

5.1.127 kAXMenuBarAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.128 kAXMenuBarItemRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.129 kAXMenuBarRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.130 kAXMenuButtonRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.131 kAXMenuClosedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.132 kAXMenuItemCmdCharAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.133 kAXMenuItemCmdGlyphAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.134 kAXMenuItemCmdModifiersAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.135 kAXMenuItemCmdVirtualKeyAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.136 kAXMenuItemMarkCharAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.137 kAXMenuItemPrimaryUIElementAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.138 kAXMenuItemRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.139 kAXMenuItemSelectedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.140 kAXMenuOpenedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.141 kAXMenuRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.142 kAXMinimizeButtonAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.143 kAXMinimizeButtonSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.144 kAXMinimizedAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.145 kAXMinimizedWindowDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.146 kAXMinuteFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.147 kAXMinValueAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.148 kAXModalAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.149 kAXMonthFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.150 kAXMovedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.151 kAXNextContentsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.152 kAXNumberOfCharactersAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.153 kAXOrderedByRowAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.154 kAXOrientationAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.155 kAXOutlineRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.156 kAXOutlineRowSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.157 kAXOverflowButtonAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.158 kAXParentAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.159 kAXPickAction as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.160 kAXPlaceholderValueAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.161 kAXPopUpButtonRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.162 kAXPositionAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.163 kAXPressAction as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.164 kAXPreviousContentsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.165 kAXProcessSwitcherListSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.166 kAXProgressIndicatorRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.167 kAXProxyAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.168 kAXRadioButtonRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.169 kAXRadioGroupRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.170 kAXRaiseAction as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.171 kAXRangeForIndexParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.172 kAXRangeForLineParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.173 kAXRangeForPositionParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.174 kAXRatingIndicatorSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.175 kAXRelevanceIndicatorRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.176 kAXResizedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.177 kAXRoleAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.178 kAXRoleDescriptionAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.179 kAXRowCollapsedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the outline notification constants.

5.1.180 kAXRowCountAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.181 kAXRowCountChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.182 kAXRowExpandedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the outline notification constants.

5.1.183 kAXRowHeaderUIElementsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.184 kAXRowIndexRangeAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.185 kAXRowRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.186 kAXRowsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.187 kAXRTFForRangeParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.188 kAXRulerMarkerRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.189 kAXRulerRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.190 kAXScreenPointForLayoutPointParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.191 kAXScreenSizeForLayoutSizeParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.192 kAXScrollAreaRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.193 kAXScrollBarRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.194 kAXSearchButtonAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.195 kAXSearchFieldSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.196 kAXSecondFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.197 kAXSecureTextFieldSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.198 kAXSelectedAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.199 kAXSelectedCellsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.200 kAXSelectedCellsChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the cell-based table notification constants.

5.1.201 kAXSelectedChildrenAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.202 kAXSelectedChildrenChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.203 kAXSelectedChildrenMovedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the layout area notification constants.

5.1.204 kAXSelectedColumnsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.205 kAXSelectedColumnsChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.206 kAXSelectedRowsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.207 kAXSelectedRowsChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.208 kAXSelectedTextAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.209 kAXSelectedTextChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.210 kAXSelectedTextRangeAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.211 kAXSelectedTextRangesAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.212 kAXServesAsTitleForUIElementsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.213 kAXSharedCharacterRangeAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.214 kAXSharedTextUIElementsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.215 kAXSheetCreatedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.216 kAXSheetRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.217 kAXShowMenuItem as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the action names used for the AXUIElement class.

5.1.218 kAXShownMenuItemAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.219 kAXSizeAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.220 kAXSliderRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.221 kAXSortButtonSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.222 kAXSortDirectionAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.223 kAXSplitGroupRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.224 kAXSplitterRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.225 kAXSplittersAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.226 kAXStandardWindowSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.227 kAXStaticTextRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.228 kAXStringForRangeParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.229 kAXStyleRangeForIndexParameterizedAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.230 kAXSubroleAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.231 kAXSystemDialogSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.232 kAXSystemFloatingWindowSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.233 kAXSystemWideRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.234 kAXTabGroupRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.235 kAXTableRowRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.236 kAXTableRowSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.237 kAXTabsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.238 kAXTextAreaRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.239 kAXTextAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.240 kAXTextFieldRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.241 kAXTimeFieldRole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.242 kAXTimelineSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.243 kAXTitleAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.244 kAXTitleChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the notification constants.

5.1.245 kAXTitleUIElementAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.246 kAXToolbarButtonAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.247 kAXToolbarButtonSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.248 kAXToolbarRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.249 kAXTopLevelUIElementAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.250 kAXTrashDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.251 kAXUIElementDestroyedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.252 kAXUIElementMBSTypeID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the TypeID of the AXUIElement class.

5.1.253 kAXUnitDescriptionAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.254 kAXUnitsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.255 kAXUnitsChangedNotification as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the layout area notification constants.

5.1.256 kAXUnknownOrientationValue as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: A constant used for the AXUIElement class.

5.1.257 kAXUnknownRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.258 kAXUnknownSortDirectionValue as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: A constant used for the AXUIElement class.

5.1.259 kAXUnknownSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.260 kAXURLAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.261 kAXURLDockItemSubrole as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.262 kAXValueAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.263 `kAXValueChangedNotification` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the `axobserver` class.

5.1.264 `kAXValueDescriptionAttribute` as `CFStringMBS`

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.265 `kAXValueIncrementAttribute` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the `AXUIElement` class.

5.1.266 `kAXValueIndicatorRole` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the `AXUIElement` class.

5.1.267 `kAXValueWrapsAttribute` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the `AXUIElement` class.

5.1.268 `kAXVerticalOrientationValue` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: A constant used for the `AXUIElement` class.

5.1.269 kAXVerticalScrollBarAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.270 kAXVerticalUnitDescriptionAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.271 kAXVerticalUnitsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.272 kAXVisibleCellsAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.273 kAXVisibleCharacterRangeAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.274 kAXVisibleChildrenAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.275 kAXVisibleColumnsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.276 kAXVisibleRowsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.277 kAXVisibleTextAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.278 kAXWarningValueAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

5.1.279 kAXWindowAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.280 kAXWindowCreatedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.281 kAXWindowDeminiaturizedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.282 kAXWindowMiniaturizedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.283 kAXWindowMovedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.284 kAXWindowResizedNotification as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the notification names used for the axobserver class.

5.1.285 kAXWindowRole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.286 kAXWindowsAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.287 kAXYearFieldAttribute as CFStringMBS

Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

Function: One of the attribute constants.

Notes: Convenience attribute that yields the year field of a date field element.

5.1.288 kAXZoomButtonAttribute as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the attribute names used for the AXUIElement class.

5.1.289 kAXZoomButtonSubrole as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: One of the role names used for the AXUIElement class.

5.1.290 MakeAXValue(theCFOBJECT as CFOBJECTMBS) as AXValueMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Creates an AXValue object containing the CFOBJECT.

Notes: Actually only the RB object around the cfoobject handle is replaced.

You can't do this using a cast in RB, so this function was created.

5.1.291 MakeAXValueFromCFRange(location as Integer, length as Integer) as AXValueMBS

Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

Function: Creates an AXValue object for a CFRange structure with the given values.

Example:

```
// create with values and read them back
dim a as AXValueMBS = AccessibilityMBS.MakeAXValueFromCFRange(5, 9)
```

```
if a.AXIsCFRange then
dim lo, le as Integer
```

```
if a.AXGetCFRange(lo, le) then
```

```
MsgBox str(lo)+" "+str(le)
else
break // error
end if
else
break // error
end if
```

5.1.292 MakeAXValueFromCGPoint(x as single, y as single) as AXValueMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Creates an AXValue object for a CGPoint structure with the given values.

5.1.293 MakeAXValueFromCGRect(x as single, y as single, width as single, height as single) as AXValueMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Creates an AXValue object for a CGRect structure with the given values.

5.1.294 MakeAXValueFromCGSize(width as single, height as single) as AXValueMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Creates an AXValue object for a CGSize structure with the given values.

5.1.295 MakeProcessTrusted(path as string) as Integer

Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

Function: Attempts to make the process represented by the specified path a trusted accessibility client.

Notes: Use this function to make a process a trusted accessibility client.

Note: The caller must be running as root to successfully call this function. In addition, the caller should relaunch the process after this function returns successfully for the trusted status to take effect.

Path: The path to the executable of the process to make trusted.

Returns an error code that indicates success or failure.

5.1.296 SystemWideAXUIElement as AXUIElementMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns a AXUIElement which covers the whole system.

Example:

```
// displays the current window title if accessibility is enabled in Mac OS X 10.2 or newer
// your application needs permissions for accessibility to make this work!

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

// show a window so there is one which can be found
window1.show

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
    FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
    if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
        FocusedApplicationElement=new AXUIElementMBS
        FocusedApplicationElement.Handle=FocusedApplication.Handle
        FocusedApplicationElement.RetainObject

        FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

        if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

            FocusedWindowElement=new AXUIElementMBS
            FocusedWindowElement.Handle=FocusedWindow.Handle
            FocusedWindowElement.RetainObject

            Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
            if Title<>nil and Title.Type=kCFStringMBSTypeID then
                cs=new CFStringMBS
                cs.handle=Title.Handle
                cs.RetainObject
                msgbox cs.str
            end if
        end if
    end if
end if
```

Notes: In the current implementation you can use this to get the AXUIElement for the frontmost application.

5.1.297 Constants

Constants

Constant	Value	Description
kAXErrorActionUnsupported	-25206	One of the error values used for the lasterror property.
kAXErrorAPIDisabled	-25211	One of the error values used for the lasterror property.
kAXErrorAttributeUnsupported	-25205	One of the error values used for the lasterror property.
kAXErrorCannotComplete	-25204	One of the error values used for the lasterror property.
kAXErrorFailure	-25200	One of the error values used for the lasterror property.
kAXErrorIllegalArgument	-25201	One of the error values used for the lasterror property.
kAXErrorInvalidUIElement	-25202	One of the error values used for the lasterror property.
kAXErrorInvalidUIElementObserver	-25203	One of the error values used for the lasterror property.
kAXErrorNotEnoughPrecision	-25214	One of the error values used for the lasterror property.
kAXErrorNotificationAlreadyRegistered	-25209	One of the error values used for the lasterror property.
kAXErrorNotificationNotRegistered	-25210	One of the error values used for the lasterror property.
kAXErrorNotificationUnsupported	-25207	One of the error values used for the lasterror property.
kAXErrorNotImplemented	-25208	One of the error values used for the lasterror property.
kAXErrorNoValue	-25212	One of the error values used for the lasterror property.
kAXErrorParameterizedAttributeUnsupported	-25213	One of the error values used for the lasterror property.
kAXErrorSuccess	0	One of the error values used for the lasterror property.

5.2 class AXObserverMBS

5.2.1 class AXObserverMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: A class to observe notifications sent by the Accessibility services.

Notes: This class requires Mac OS X 10.2 to work.

Subclass of the CObjectMBS class.

5.2.2 Methods

5.2.3 AddNotification(element as AXUIElementMBS, notification as CFStringMBS) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Adds a notification to the observer.

Notes: Returns an error code. (0 for no error and -1 if the function is not available)

5.2.4 Create(pid as Integer) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Creates a new observer for the given process.

Notes: You need a valid process ID to observe the target application. The ProcessMBS class can help you.

5.2.5 RemoveNotification(element as AXUIElementMBS, notification as CFStringMBS) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Removes a notification from the observer.

Notes: Returns an error code. (0 for no error and -1 if the function is not available)

5.2.6 Events

5.2.7 Action(element as AXUIElementMBS, notification as CFStringMBS)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: Called whenever an action occurs.

5.3 class AXUIElementMBS

5.3.1 class AXUIElementMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: This class represents an element of the User Interface of an application.

Example:

```
// displays the current window title if accessibility is enabled in Mac OS X 10.2 or newer

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
  FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
  if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
    FocusedApplicationElement=new AXUIElementMBS
    FocusedApplicationElement.Handle=FocusedApplication.Handle
    FocusedApplicationElement.RetainObject

    FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

    if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

      FocusedWindowElement=new AXUIElementMBS
      FocusedWindowElement.Handle=FocusedWindow.Handle
      FocusedWindowElement.RetainObject

      Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
      if Title<>nil and Title.Type=kCFStringMBSTypeID then
        cs=new CFStringMBS
        cs.handle=Title.Handle
        cs.RetainObject
        msgbox cs.str
      end if
    end if
  end if
end if
```

Notes: e.g. a window, a menuitem or a button.

This class requires Mac OS X 10.2 to work.

Subclass of the CFOBJECTMBS class.

5.3.2 Methods

5.3.3 ActionDescription(action as CFStringMBS) as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the description of the action with the given name.

Notes: Returns nil on any error.

5.3.4 ActionNames as CFArrayMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: An CF array with all the possible action names.

Notes: Returns nil on any error.

5.3.5 AttributeNames as CFArrayMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns a CF array with all the possible attribute names.

5.3.6 AttributeValue(attribute as CFStringMBS) as AXValueMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the value of an attribute.

5.3.7 AttributeValues(attribute as CFStringMBS, minindex as Integer, maxindex as Integer) as CFArrayMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the values of an attribute as a CF array.

5.3.8 ElementAtPosition(x as single, y as single) as AXUIElementMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the element which is on the given position.

Notes: e.g. on a window.

5.3.9 GetAttributeValueCount(attribute as CFStringMBS) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Counts how much attributes of the given name exists.

5.3.10 IsAttributeSettable(attribute as CFStringMBS) as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns true if the attribute with the given name is settable.

Notes: Returns false on any error.

5.3.11 PerformAction(action as CFStringMBS)

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Performs a named action.

5.3.12 PostKeyboardEvent(keyChar as Integer, virtualKey as Integer, keydown as boolean)

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Posts a keyboard event.

Example:

```
// For example, to produce a 'Z',  
// the SHIFT key must be down,  
// the 'z' key must go down,  
// and then the SHIFT and 'z' key must be released:
```

```
dim a as AXUIElementMBS  
// get the element
```

```
a.PostKeyboardEvent( 0, 56, true ) // shift down
a.PostKeyboardEvent( asc("Z"), 6, true ) // 'z' down
a.PostKeyboardEvent( asc("Z"), 6, false ) // 'z' up
a.PostKeyboardEvent( 0, 56, false ) // shift up
```

Notes: You can only pass the root or application uielement.
The KeyCodeMBS class may help you to find the correct codes.

Synthesize keyboard events. Based on the values entered, the appropriate key down, key up, and flags changed events are generated.

If keyChar is NUL (0), an appropriate value will be guessed at, based on the default keymapping.

All keystrokes needed to generate a character must be entered, including SHIFT, CONTROL, OPTION, and COMMAND keys.

To find the virtual keys, well check the RB documentation for the keyboard class.

5.3.13 ProcessID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The Process ID of an application.

Notes: The unix PID.

5.3.14 SetAttributeValue(attribute as CFStringMBS, value as CFObjectMBS)

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Sets the value of an attribute.

Notes: Changed type of value to CFObject in plugin version 6.3. Before it was an AXValue.

5.4 class AXValueMBS

5.4.1 class AXValueMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: An AXValue is a CObject but some extra data types are allowed.

Notes: Every AXValue is a CObject. In case the CObject contains unknown data or just binary data it can be a AXValue object.

This class requires Mac OS X 10.2 to work.

Subclass of the CObjectMBS class.

5.4.2 Methods

5.4.3 AXGetCFRange(byref location as Integer, byref length as Integer) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the values of a CFRange in case the AXValue holds a CFRange.

Notes: Returns true if it's a CFRange.

5.4.4 AXGetCGPoint(byref x as single, byref y as single) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the values of the CGPoint structure inside the AXValue.

Notes: Returns true if successful.

5.4.5 AXGetCGRect(byref x as single, byref y as single, byref width as single, byref height as single) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the values of the CGRect inside the AXValue in case there is one.

Notes: Returns true if successful.

5.4.6 AXGetCGSize(byref width as single, byref height as single) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the values of the CGSize structure inside the AXValue in case there is one.

Notes: Returns true if successful.

5.4.7 Properties

5.4.8 AXIsCRange as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns true if the AXValue contains a CRange structure.

Notes: (Read only property)

5.4.9 AXIsCGPoint as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns true if the AXValue contains a CGPoint structure.

Notes: (Read only property)

5.4.10 AXIsCGRect as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns true if the AXValue contains a CGRect structure.

Notes: (Read only property)

5.4.11 AXIsCGSize as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns true if the AXValue contains a CGSize structure.

Notes: (Read only property)

5.4.12 AXTypeID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Returns the Type ID of the AXValue.

Notes: Values:

Types from CoreGraphics:

kAXValueCGPointType = 1,

kAXValueCGSizeType = 2,

kAXValueCGRectType = 3,

Types from CFBase:

kAXValueCFRangeType = 4,

Other:

kAXValueIllegalType = 0

In case this function returns 0 the object may be a normal CFObject.
(Read only property)

Chapter 6

Alias

6.1 module CFBookmarkMBS

6.1.1 module CFBookmarkMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: The module for Mac OS X bookmark/alias functions.

Notes: Bookmark data strings have no text encoding. If you use `ConvertEncoding` on them, you destroy them.

Available with Mac OS X 10.6 or newer.

For older systems, please use `MacAliasMBS` class.

Blog Entries

- [MBS Xojo Plugins, version 20.6pr3](#)
- [MBS Xojo Plugins, version 17.1pr3](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr4](#)
- [MBS Xojo / Real Studio Plugins, version 14.1pr2](#)
- [MBS Real Studio Plugins, version 11.3pr12](#)
- [MBS Real Studio Plugins, version 11.3pr10](#)

6.1.2 Methods

6.1.3 Available as boolean

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Whether bookmark functions are available.

Notes: Returns true on Mac OS X 10.6 or newer.

6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a folderitem, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Example:

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim Bookmark as string = CFBookmarkMBS.CreateBookmarkData(file, CFBookmarkMBS.kCreationSuitableForBookmarkFile)
```

```
MsgBox str(lenb(Bookmark))+ " bytes"
```

Notes: file: the folderitem to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163
- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167

- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a folderitem, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: file: the folderitem to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167
- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a URL, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: URL: the URL to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167
- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a URL, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: URL: the URL to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163
- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167
- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a URL, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: URL: the URL to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163

- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167
- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a URL, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: URL: the URL to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163
- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165

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- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167
- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a URL, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: URL: the URL to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163
- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 167

6.1.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Create a string containing an externalizable representation from a URL, modified with the given options, including (at the minimum) any properties in the propertiesToInclude array which are retrievable from the given url.

Notes: URL: the URL to create a bookmark data from.

options: a set of options which control creation of the bookmark data

resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.

Returns a string containing an data, which can be later be passed to ResolveBookmarkData.

See also:

- 6.1.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 162
- 6.1.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 163
- 6.1.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 163
- 6.1.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 164
- 6.1.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 165
- 6.1.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 166
- 6.1.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 167

6.1.12 CreateBookmarkDataFromAliasRecord(AliasRecordData as string) as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Create a string containing bookmarkdata by converting the alias data in aliasRecordData which should be the contents of an AliasRecord copied into a string.

Notes: The created bookmarkdata can be passed into ResolveBookmarkData to resolve the item into a folderitem or URL, or a small set of information can be returned from ResourcePropertiesForKeysFromBookmarkData / ResourcePropertyForKeyFromBookmarkData.

AliasRecordData: the contents of an AliasRecord to create bookmark data for

Returns a string containing bookmark data.

6.1.13 LastError as CFErrorMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: The last error.

Notes: This is a CFErrorMBS object.

6.1.14 ReadBookmarkDataFromFile(file as folderitem) as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a file which is a Finder "alias" file, return a string with the bookmark data from the file.

Notes: If file points to an alias file created before SnowLeopard which contains Alias Manager information and no bookmark data, then a bookmark data string will be synthesized which contains an approximation of the alias information in a format which can be used to resolve the bookmark. If an error prevents reading the data or if it is corrupt, nil will be returned and lasterror will be filled in if error object.

File: a folderitem to to the alias file to create the bookmark data from.

Returns a string containing bookmark data, or nil if there was an error creating bookmark data from the file, such as if the file is not an alias file.

6.1.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a folderitem of the item it was a bookmark to.

Example:

```
dim AliasFile as FolderItem = SpecialFolder.Desktop.trueChild("test.alias")
dim Bookmark as string = CFBookmarkMBS.ReadBookmarkDataFromFile(AliasFile)
dim isStale as Boolean
dim options as UInt32 = CFBookmarkMBS.kResolutionWithoutUIMask + CFBookmarkMBS.kResolution-
WithoutMountingMask
dim file as FolderItem = CFBookmarkMBS.ResolveBookmarkData(Bookmark, options, nil, isStale)

if file<>Nil then
  MsgBox file.NativePath
else
  dim e as CFErrorMBS = CFBookmarkMBS.LastError
  if e = nil then
    MsgBox "Failed to resolve."
  else
```

MsgBox e.Description
 end if
 end if

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.

See also:

- 6.1.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem 170
- 6.1.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string 171
- 6.1.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string 172

6.1.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a folderitem of the item it was a bookmark to.

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.

See also:

- 6.1.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem 169
- 6.1.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string 171
- 6.1.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string 172

6.1.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a folderitem of the item it was a bookmark to.

Notes:

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.

See also:

- 6.1.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem 169
- 6.1.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem 170
- 6.1.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string 172

6.1.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a folderitem of the item it was a bookmark to.

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.

See also:

- 6.1.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem 169
- 6.1.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem 170
- 6.1.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string 171

6.1.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a CFURL of the item it was a bookmark to.

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed

to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.

See also:

- 6.1.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 174
- 6.1.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS 175
- 6.1.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 176

6.1.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a CFURL of the item it was a bookmark to.

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.

See also:

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- 6.1.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS 173
- 6.1.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS 175
- 6.1.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 176

6.1.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a CFURL of the item it was a bookmark to.

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.

See also:

- 6.1.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS 173
- 6.1.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 174
- 6.1.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 176

6.1.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Given a bookmark data string, returns a CFURL of the item it was a bookmark to.

Notes:

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error (other than "original item can not be found") occurs during the process, return nil and fill in lasterror property)

bookmark: a string containing a bookmark data, created with CreateBookmarkData

options: options which affect the resolution

relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.

resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.

isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.

See also:

- 6.1.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS 173
- 6.1.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 174
- 6.1.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS 175

6.1.23 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string) as dictionary

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark, return a dictionary of all properties.

Example:

```

dim f as FolderItem = SpecialFolder.Desktop.TrueChild("Webseiten")

dim data as string = CFBookmarkMBS.ReadBookmarkDataFromFile(f)

if data.lenb >0 then
dim dic as Dictionary = CFBookmarkMBS.ResourcePropertiesForKeysFromBookmarkData(data)

Break // see in debugger
end if

```

Notes: This returns only the properties stored within the bookmark and will not attempt to resolve the bookmark or do i/o.

BookmarkData: a string containing a bookmark data, created with CreateBookmarkData

Returns a dictionary containing the values for all properties passed in obtained from the bookmark data (not by attempting to resolve it or do i/o in any way)

Version 17.1 of our plugin knows a list of keys, so it tries all keys and returns the dictionary with matching ones.

See also:

- 6.1.24 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string, resourcePropertiesToReturn() as string) as dictionary 177

6.1.24 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string, resourcePropertiesToReturn() as string) as dictionary

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark, return a dictionary of properties.

Notes: This returns only the properties stored within the bookmark and will not attempt to resolve the bookmark or do i/o.

BookmarkData: a string containing a bookmark data, created with CreateBookmarkData

resourcePropertiesToReturn: Optional an array of string of the properties of the bookmark data which the client would like returned.

Returns a dictionary containing the values for the properties passed in obtained from the bookmark data (not by attempting to resolve it or do i/o in any way)

See also:

- 6.1.23 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string) as dictionary 176

6.1.25 ResourcePropertyForKeyFromBookmarkData(BookmarkData as string, resourcePropertyKey as string) as Variant

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a bookmark, return the value for a given property from the bookmark data.

Notes: This returns only the properties stored within the bookmark and will not attempt to resolve the bookmark or do i/o.

BookmarkData: a string containing a bookmark data, created with CreateBookmarkData

resourcePropertyKey: the property key to return.

Returns a variant value for the property passed in obtained from the bookmark data (not by attempting to resolve it or do i/o in any way)

6.1.26 StartAccessingSecurityScopedResource(URL as CFURLMBS) as boolean

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Given a file URL created by resolving a bookmark data created with security scope, make the resource referenced by the url accessible to the process.

Notes: When access to this resource is no longer needed the client should call StopAccessingSecurityScopedResource(). Each call to StartAccessingSecurityScopedResource() must be balanced with a call to StopAccessingSecurityScopedResource().

URL: the file URL for the resource returned by CreateByResolvingBookmarkData() using kResolutionWithSecurityScope.

Returns true if access was granted and false if the url does not reference a security scoped resource, or if some error occurred which didn't allow access to be granted.

Available on Mac OS X 10.7 or newer.

6.1.27 StopAccessingSecurityScopedResource(URL as CFURLMBS)

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Revokes the access granted to the url by a prior successful call toStartAccessingSecurityScopedResource().

Notes: Available on Mac OS X 10.7 or newer.

6.1.28 WriteBookmarkDataToFile(BookmarkData as string, file as folderitem, options as UInt32) as boolean

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Given a created bookmarkData object, create a new Finder "alias" file at file which contains the bookmark data.

Example:

```
dim file as FolderItem = SpecialFolder.Desktop.TrueChild("test.rtf")
dim Bookmark as string = CFBookmarkMBS.CreateBookmarkData(file, CFBookmarkMBS.kCreationSuitableForBookmarkFile)

dim AliasFile as FolderItem = SpecialFolder.Desktop.TrueChild("test.alias")
if CFBookmarkMBS.WriteBookmarkDataToFile(Bookmark, AliasFile, 0) then
  MsgBox "OK"
else
  dim e as CFErrorMBS = CFBookmarkMBS.lasterror
  MsgBox "Failed: " + e.Description
end if
```

Notes: If file points to a directory, an alias file will be created with the same name as the bookmarked item and a ".alias" extension. If file points to a file and it exists it will be overwritten. If a .alias extension is not present it will be added. In addition to the bookmark data, sufficient pre-SnowLeopard alias data will added to the file to allow systems running something before SnowLeopard to resolve this file using Alias Manager routines and get back the same file as the bookmark routines.

The bookmark data must have been created with the kCFURLBookmarkCreationSuitableForBookmarkFile option and an error will be returned if not.

bookmark: A string containing a bookmark data, created with CreateBookmarkData
 file: The file/folder to write the alias to.
 options: options flags

Lasterror is set.

6.1.29 Constants

Creation options.

Constant	Value	Description
kCreationMinimalBookmarkMask	512	Creates a bookmark with "less" information, which may be small or unable to resolve in certain ways.
kCreationPreferFileIDResolutionMask	256	At resolution time, this alias will prefer resolving by the embedded path.
kCreationSecurityScopeAllowOnlyReadAccess	4096	Mac OS X 10.7.3 and later, if used with kCFURLBookmarkCreateWithSecurityScope, at resolution time only read access to the resource will be allowed.
kCreationSuitableForBookmarkFile	1024	Includes in the created bookmark those properties which are needed to create a bookmark/alias file.
kCreationWithSecurityScope	2048	Mac OS X 10.7.3 and later, include information in the bookmark creation to allow the same sandboxed process to access the resource after being resolved.

Resolving options.

Constant	Value	Description
kResolutionWithoutMountingMask	512	Don't mount a volume during bookmark resolution.
kResolutionWithoutUIMask	256	Don't perform any UI during bookmark resolution.
kResolutionWithSecurityScope	1024	Mac OS X 10.7.3 and later, extract the security scope included at creation time to provide the ability to access the resource.

Chapter 7

Authorization

7.1 class AuthorizationItemMBS

7.1.1 class AuthorizationItemMBS

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: A class for an authorization right.

7.1.2 Properties

7.1.3 Flags as Integer

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Flags for this item.

Notes: Flags returned in the flags field of ItemSet Items when calling Authorize:

kAuthorizationFlagCanNotPreAuthorize 1

(Read and Write property)

7.1.4 Name as String

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: The name of the item.

Notes: (Read and Write property)

7.1.5 Value as String

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: The value of the item.

Notes: (Read and Write property)

7.2 class AuthorizationItemSetMBS

7.2.1 class AuthorizationItemSetMBS

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: A class for a set of authorization rights.

7.2.2 Methods

7.2.3 Append(item as AuthorizationItemMBS)

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Adds a new item to the list.

7.2.4 Remove(index as Integer)

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Removes the item with the given index.

7.2.5 Properties

7.2.6 Count as Integer

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Returns the number of items in the list.

Notes: (Read and Write property)

7.2.7 Item(index as Integer) as AuthorizationItemMBS

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Returns an item from the list.

Notes: (Read and Write computed property)

7.3 class AuthorizationMBS

7.3.1 class AuthorizationMBS

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: A class to run a root shell on Mac OS X.

Notes: Some notes from Ilija Injac on this usage of this class:

The main problem for the execution of the perl script was, that perl is not able to find the required perl-modules at execution with the option "-U" (this switch is set for security reasons).

It was also necessary to include the perl-modules from inside the perl script wich has to be executed.

Inside the Xojo code i created a AuthorizationItemMBS with the value "/usr/bin/perl":

```
...
i = new AuthorizationItemMBS

i.name    = a.kAuthorizationItemRightExecute
i.value   = "/usr/bin/perl"
```

...

Actually it is the same source as in Christians "Authorization 1" example within the "test1" function. And it works !

Blog Entries

- [MBS Xojo Plugins, version 20.5pr8](#)
- [MBS Xojo Plugins, version 17.3pr5](#)
- [MBS Xojo Plugins, version 17.3pr4](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr5](#)

7.3.2 Methods

7.3.3 Authorize(rights as AuthorizationItemSetMBS, flags as Integer)

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Short for Authorize without the resulting rights set.

Example:

```
dim a as AuthorizationMBS
dim s as AuthorizationItemSetMBS
dim i as AuthorizationItemMBS
dim Flags as Integer
```

```

// check whether use is admin

a=new AuthorizationMBS

s=new AuthorizationItemSetMBS
i=new AuthorizationItemMBS
i.Name="com.mycompany.myapplication.command1"
s.Append i

if a.NewAuthorization(nil,a.kAuthorizationFlagDefaults) then // create
Flags=BitwiseOr(a.kAuthorizationFlagExtendRights,a.kAuthorizationFlagInteractionAllowed)

a.Authorize(s,flags)
MsgBox str(a.LastError)
// -60006 for cancel = no admin
// 0 on success
end if

```

See also:

- 7.3.4 Authorize(rights as AuthorizationItemSetMBS, flags as Integer, byref outright as AuthorizationItemSetMBS) 185

7.3.4 Authorize(rights as AuthorizationItemSetMBS, flags as Integer, byref outright as AuthorizationItemSetMBS)

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Tries to extend authorization to have root rights.

Notes: The Authorized property is set if this function was successful.

Lasterror is set.

outright is on return a list of the rights which are authorized.

Extends the rights of the class.

When the kAuthorizationFlagInteractionAllowed flag is set, user interaction will happen when required. Failing to set this flag will result in this call failing with a errAuthorizationInteractionNotAllowed status when interaction is required.

Setting the kAuthorizationFlagExtendRights flag will extend the currently available rights.

Setting the `kAuthorizationFlagPartialRights` flag will cause this call to succeed if only some of the requested rights are being granted by the system. Unless this flag is set this API will fail if not all the requested rights could be obtained.

Setting the `kAuthorizationFlagDestroyRights` flag will prevent any additional rights obtained during this call from being preserved after returning from this API.

Setting the `kAuthorizationFlagPreAuthorize` flag will pre authorize the requested rights so that at a later time – by calling `GetExternalForm()` follow by `NewAuthorizationFromExternalForm()` – the obtained rights can be used in a different process. Rights that can't be preauthorized will be treated as if they were authorized for the sake of returning an error (in other words if all rights are either authorized or could not be preauthorized this call will still succeed).

The rights which could not be preauthorized are not currently authorized and may fail to authorize when a later call to `Authorize()` is made, unless the `kAuthorizationFlagExtendRights` and `kAuthorizationFlagInteractionAllowed` flags are set. Even then they might still fail if the user does not supply the correct credentials.

The reason for passing in this flag is to provide correct audit trail information and to avoid unnecessary user interaction.

Error codes:

<code>errAuthorizationSuccess</code>	0	No error.
<code>errAuthorizationInvalidRef</code>	-60002	The authorization parameter is invalid.
<code>errAuthorizationInvalidSet</code>	-60001	The rights parameter is invalid.
<code>errAuthorizationInvalidPointer</code>	-60004	The <code>authorizedRights</code> parameter is invalid.

See also:

- 7.3.3 `Authorize(rights as AuthorizationItemSetMBS, flags as Integer)` 184

7.3.5 Available as boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Returns true if the Authorization Framework was loaded correctly.

Notes: Returns false on any error.

7.3.6 close

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The destructor.

Notes: Strings made with the ExternalForm function will become invalid!

There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

7.3.7 closeStream

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Closes the stream.

7.3.8 EOFStream as boolean

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Returns true if the Stream is at the end.

7.3.9 Execute(toolpath as string, parameters() as string)

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Executes a command line application in the background.

Notes: You may make some small shell script which you launch in background. This script can change some other utility to run as root (Setuid), so you can do admin stuff using the normal shell class.

Lasterror is set.

Currently this function is not available to RB versions before 3.5.

Note that the parameters parameter is an array of strings and not just one. toolpath should use an absolute path in unix style.

Lasterror is set to -1 if the path is empty or you are not using Mac OS X.

See also:

- 7.3.10 Execute(toolpath as string, parameters() as string, openstream as boolean)

7.3.10 Execute(toolpath as string, parameters() as string, openstream as boolean)

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Same as Execute, but you can specify if the stream to the command line application should be opened.

Notes: Currently this function is not available to RB versions before 3.5. Note that the parameters parameter is an array of strings and not just one. toolpath should use an absolute path in unix style.

Lasterror is set to -1 if the path is empty or you are not using Mac OS X. See also:

- 7.3.9 Execute(toolpath as string, parameters() as string)

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7.3.11 ExternalForm as string

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Returns a string with binary data about this Authorization object.

Notes: This external representation depends on your process. You can't save it to disk or keep it longer than the Authorization object exists.

If the Authorization object is destroyed, your application quits or the authorization times out, this external form becomes invalid.

7.3.12 FlushStream

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Flushes the stream to the background application.

7.3.13 Info as AuthorizationItemSetMBS

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Returns the list of currently authorized rights.

Notes: Returns nil on any error.

7.3.14 MakeStreamAsyncon

Plugin Version: 6.3, Platform: macOS, Targets: Desktop only.

Function: Modifies the Stream created in the Execute method to run non blocking.

7.3.15 NewAuthorization(rights as AuthorizationItemSetMBS, flags as Integer) as Boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Creates a new Authorization object.

Notes: Lasterror is set. Returns true if successful.

Create a new authorization object which can be used in other authorization calls.

When the `kAuthorizationFlagInteractionAllowed` flag is set, user interaction will happen when required. Failing to set this flag will result in this call failing with a `errAuthorizationInteractionNotAllowed` status in the `lasterror` property when interaction is required.

Setting the `kAuthorizationFlagExtendRights` flag will extend the currently available rights. If this flag is set the class will grant all the rights requested when `errAuthorizationSuccess` is returned in the `lasterror` property. If this flag is not set the operation will almost certainly succeed, but no attempt will be made to make the requested rights available.

Call the `Info` function to figure out which of the requested rights are granted by the system.

Setting the `kAuthorizationFlagPartialRights` flag will cause this call to succeed if only some of the requested rights are being granted by the system. Unless this flag is set this API will fail if not all the requested rights could be obtained.

Setting the `kAuthorizationFlagPreAuthorize` flag will pre authorize the requested rights so that at a later time – by calling `GetExternalForm()` follow by `NewAuthorizationFromExternalForm()` in a different object – the obtained rights can be used in a different process. Rights that can't be preauthorized will be treated as if they were authorized for the sake of returning an error (in other words if all rights are either authorized or could not be preauthorized this call will still succeed).

The rights which could not be preauthorized are not currently authorized and may fail to authorize when a later call to `Authorize()` is made, unless the `kAuthorizationFlagExtendRights` and `kAuthorizationFlagInteractionAllowed` flags are set. Even then they might still fail if the user does not supply the correct credentials.

The reason for passing in this flag is to provide correct audit trail information and to avoid unnecessary user interaction.

rights (input/optional):

An `AuthorizationItemSet` containing rights for which authorization is being requested. If nil are specified the class will authorize nothing at all.

flags (input) options specified using the different constants from this class.

Error codes:

<code>errAuthorizationSuccess</code>	0	Authorization or all requested rights succeeded.
<code>errAuthorizationDenied</code>	-60005	The authorization for one or more of the requested rights was denied.
<code>errAuthorizationCanceled</code>	-60006	The authorization was canceled by the user.
<code>errAuthorizationInteractionNotAllowed</code>	-60007	The authorization was denied since no interaction with the user was allowed.

7.3.16 `NewAuthorizationFromExternalForm(s as string)` as Boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Creates a new Authorization object from data inside a string.

Notes: You can store an authorization in a string for use in a subprocess. For example your application can ask the user for Root rights and you pass this string to a launched terminal application which will use it without having it's own interface.

Lasterror is set. Returns true if successfull.

7.3.17 `ReadStream(count as Integer)` as string

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Reads bytes from the output stream of the executing app.

Example:

```

dim s(0) as String
dim a as AuthorizationMBS
dim e as Integer

s(0)="-show"

a=new AuthorizationMBS

if a.SimpleNewAuthorization then // create

a.Execute("/usr/sbin/dsconfigad",s,true) // and run it

if a.LastError<>0 then
MsgBox "Lasterror on Execute: "+str(a.LastError)
else
e=a.Wait // wait for process to terminate. Returns PID
if a.LastError<>0 then
MsgBox "Lasterror on Wait: "+str(a.LastError)

```

```

end if
end if
msgbox a.ReadStream(1024)
end if

```

Notes: Tries to read count bytes.

Lasterror is set.
The returned string will be as long as the number of strings read.

Lasterror is set to -1 by the plugin if the stream is not open, or you are not using Mac OS X or the memory allocation failed.

7.3.18 SimpleAuthorize

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Just asks for the Authorization.

Notes: This is the function from MBS Plugin 3.0.

7.3.19 SimpleNewAuthorization as Boolean

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Creates a new authorization handle.

Example:

```

// uses chmod on test.pdf on the desktop to make
// it read-, write- and executeable by everyone.

dim s(1) as String
dim a as AuthorizationMBS

a=new AuthorizationMBS

if a.SimpleNewAuthorization then
s(0)="777"
s(1)=SpecialFolder.Desktop.Child("test.pdf").NativePath

MsgBox s(1)
a.execute("/bin/chmod",s)
msgbox "Executed:"+str(a.lasterror)

```

end if

Notes: This is the function from MBS Plugin 3.0.

7.3.20 Wait as Integer

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Waits till the background application is done.

Notes: Returns the Process ID or -1 on an error.

Lasterror is set.

7.3.21 WriteStream(s as string) as Integer

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: Writes the given bytes in the string to the stream.

7.3.22 Properties

7.3.23 Authorized as Boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Set to true if the last call to Authorizate was successfull.

Notes: (Read and Write property)

7.3.24 Handle as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The handle to the Mac OS authorization object.

Notes: The C type is AuthorizationRef.

(Read and Write property)

7.3.25 KeepRights as Boolean

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: whether the destructor will keep the rights allive for the next use.

Notes: Normally the rights will be destroyed in the destructor so on the next use of the class the user has to reenter the password. If KeepRights=true the rights will not be destroyed.
(Read and Write property)

7.3.26 LastError as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The last error code reported.

Notes: Lasterror is -1 if the function is not supported (e.g. on Windows).

Authorization error codes:

errAuthorizationSuccess	0,	The operation completed successfully.
errAuthorizationInvalidSet	-60001,	The set parameter is invalid.
errAuthorizationInvalidRef	-60002,	The authorization parameter is invalid.
errAuthorizationInvalidTag	-60003,	The tag parameter is invalid.
errAuthorizationInvalidPointer	-60004,	The authorizedRights parameter is invalid.
errAuthorizationDenied	-60005,	The authorization was denied.
errAuthorizationCanceled	-60006,	The authorization was canceled by the user.
errAuthorizationInteractionNotAllowed	-60007,	The authorization was denied since no user interaction was possible.
errAuthorizationInternal	-60008,	something else went wrong
errAuthorizationExternalizeNotAllowed	-60009,	authorization externalization denied
errAuthorizationInternalizeNotAllowed	-60010,	authorization internalization denied
errAuthorizationInvalidFlags	-60011,	invalid option flag(s)
errAuthorizationToolExecuteFailure	-60031,	cannot execute privileged tool
errAuthorizationToolEnvironmentError	-60032	privileged tool environment error

Other Mac OS error codes like -50 for wrong parameters are also possible.

(Read and Write property)

7.3.27 StreamHandle as Integer

Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

Function: The handle to the stream for the terminal running in the background with your command line application.

Notes: (Read and Write property)

7.3.28 Constants

Constants

Constant	Value	Description
<code>kAuthorizationEmptyEnvironment</code>	<code>nil</code>	Indicates an empty environment. You should pass this constant in function with an environment parameter if you have no environment data to provide.
<code>kAuthorizationExternalFormLength</code>	<code>32</code>	Indicates, in number of bytes, the length of the array in the <code>AuthorizationInternalForm</code> structure.

Error Codes

Constant	Value	Description
<code>errAuthorizationCanceled</code>	<code>-60006</code>	The authorization was cancelled by the user.
<code>errAuthorizationDenied</code>	<code>-60005</code>	The authorization was denied.
<code>errAuthorizationExternalizeNotAllowed</code>	<code>-60009</code>	The authorization is not allowed to be converted to an external form.
<code>errAuthorizationInteractionNotAllowed</code>	<code>-60007</code>	The authorization was denied since no user interaction was possible.
<code>errAuthorizationInternal</code>	<code>-60008</code>	Unable to obtain authorization for this operation.
<code>errAuthorizationInternalizeNotAllowed</code>	<code>-60010</code>	The authorization is not allowed to be created from an external form.
<code>errAuthorizationInvalidFlags</code>	<code>-60011</code>	The provided option flag(s) are invalid for this authorization operation.
<code>errAuthorizationInvalidPointer</code>	<code>-60004</code>	The returned authorization is invalid.
<code>errAuthorizationInvalidRef</code>	<code>-60002</code>	The authorization reference is invalid.
<code>errAuthorizationInvalidSet</code>	<code>-60001</code>	The authorization rights are invalid.
<code>errAuthorizationInvalidTag</code>	<code>-60003</code>	The authorization tag is invalid.
<code>errAuthorizationSuccess</code>	<code>0</code>	No error.
<code>errAuthorizationToolEnvironmentError</code>	<code>-60032</code>	An invalid status was returned during execution of a privileged tool.
<code>errAuthorizationToolExecuteFailure</code>	<code>-60031</code>	The specified program could not be executed.

Flag values

Constant	Value	Description
<code>kAuthorizationFlagCanNotPreAuthorize</code>	<code>1</code>	Indicates the Security Server could not preauthorize the right.
<code>kAuthorizationFlagDefaults</code>	<code>0</code>	If no bits are set, none of the following features are available.
<code>kAuthorizationFlagDestroyRights</code>	<code>8</code>	If the bit specified by this mask is set, the Security Server revokes authorization from the process as well as from any other process that is sharing the authorization. If the bit specified by this mask is not set, the Security Server revokes authorization from the process but not from other processes that are sharing the authorization.
<code>kAuthorizationFlagExtendRights</code>	<code>2</code>	If the bit specified by this mask is set, the Security Server attempts to grant the rights requested. Once the Security Server denies one right, it ignores the remaining requested rights.
<code>kAuthorizationFlagInteractionAllowed</code>	<code>1</code>	If the bit specified by this mask is set, you permit the Security Server to interact with the user when necessary.
<code>kAuthorizationFlagPartialRights</code>	<code>4</code>	If the bit specified by this mask and the <code>kAuthorizationFlagExtendRights</code> bit are set, the Security Server grants or denies rights on an individual basis. If all rights are checked.
<code>kAuthorizationFlagPreAuthorize</code>	<code>16</code>	If the bit specified by this mask is set, the Security Server preauthorizes the rights requested.

Chapter 8

Carbon Events

8.1 class CarbonApplicationEventsMBS

8.1.1 class CarbonApplicationEventsMBS

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. You can use `NSApplicationDelegateMBS` for Cocoa instead. **Function:** A class for receiving events sent to the application.

Notes: Even if the name of the class includes Carbon, it works fine with Cocoa applications for most events.

Apple deprecated the carbon framework, but still in a Cocoa application, some features are only available through this class due to missing replacements. So we use `CarbonApplicationEventsMBS` class until a future MacOS update breaks it.

Blog Entries

- [MBS Plugins updated for Xojo 2019r2](#)
- [MBS Xojo Plugins, version 19.4pr1](#)
- [MBS Xojo / Real Studio Plugins, version 16.1pr3](#)
- [Tip of the day: Carbon events for Cocoa app](#)
- [Gestures on Mac OS X](#)
- [Dock Menu for Cocoa in Real Studio](#)
- [Magic Mouse in REALbasic](#)

8.1.2 Methods

8.1.3 CreateTypeStringWithOSType(ostype as string) as CFStringMBS

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Creates a type string object for the use in the ServiceGetTypes event.

8.1.4 Listen

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Starts listening for events send to your application.

8.1.5 Properties

8.1.6 Available as boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Whether this events are firing.

Notes: Still each event may have it's own requirement.

(Read only property)

8.1.7 EventCount as Integer

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse event counter.

Notes: Increases whenever one of the following events occurs:

MouseUp, MouseMoved, MouseDragged and MouseDown.

(Read and Write property)

8.1.8 Lasterror as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The last reported Mac OS error code.

Notes: 0 if successfull, -1 if function is not available.

(Read and Write property)

8.1.9 MouseButton as Integer

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse buttons used at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.1.10 MouseChord as Integer

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse chord state at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.1.11 MouseClickCount as Integer

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse click count at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.1.12 MouseDeltaX as Single

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse movement at the time of the last mouse event.

Notes: Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

8.1.13 MouseDeltaY as Single

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse movement at the time of the last mouse event.

Notes: Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

8.1.14 MouseModifierKeys as Integer

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The modifier key state at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

The modifiers field contains information about the state of the modifier keys and the mouse button at the time the event was posted.

Each of the modifier keys is represented by a specific bit in the modifiers field. You can use these constants as masks to test the setting of various bits in the modifiers field:

activeFlag	1	set if window being activated or if mouse-down event caused foreground switch
btnState	128	set if mouse button up
cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

If your application attaches special meaning to any of these keys in combination with other keys or when the mouse button is down, you can test the state of the modifiers field to determine the action your application should take. For example, you can use this information to determine whether the user pressed the Command key and another key to make a menu choice.

Some keyboards do not distinguish between the right or left Control, Shift, and Option keys; for example, the virtual key code for the right Shift key and left Shift key might be the same. For these keyboards, if the user presses the Control, Shift, or Option key, the Event Manager sets only the bits corresponding to the shiftKey, optionKey, and controlKey constants. For keyboards that do distinguish between these keys, the Event Manager sets the bits in the modifiers field to indicate whether the right or left Control, Shift, or Option keys were pressed. For example, the Event Manager sets bit 13 in the modifiers field if the user presses the right Shift key and sets bit 9 if the user presses the left Shift key. In most cases your application should not need to distinguish between the left and right Control, Shift, and Option keys.

(Read and Write property)

8.1.15 MouseX as Single

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse position at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.1.16 MouseY as Single

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: The mouse position at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.1.17 Tablet as Boolean

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: Whether you want to get the tablet event data.

Notes: As not every application needs tablet event information, this is optional.
Set to true to get the TabletPoint and TabletProximity parameters filled in the events.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.1.18 TabletPoint as CarbonEventsTabletPointMBS

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: Saves the current tablet point object.

Notes: Whenever an event is received and the tablet property is true and there is point information available, a reference to the CarbonEventsTabletPointMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.1.19 TabletProximity as CarbonEventsTabletProximityMBS

Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

Function: Saves the current tablet proximity object.

Notes: Whenever an event is received and the tablet property is true and there is proximity information available, a reference to the CarbonEventsTabletProximityMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.1.20 Events

8.1.21 ApplicationActivated

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever your application is activated.

Notes: In older versions this event was misspelled: ApplicationActivated

8.1.22 ApplicationDeactivated

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever your application is deactivated.

Notes: In older versions this event was misspelled: ApplicationDeactivated

8.1.23 ApplicationGetDockTileMenu as Integer

Plugin Version: 3.0, Platform: macOS, Targets: .

Function: Called whenever the system likes to know which menu to display in the dock tile.

Notes: Create a menu using the MenuMBS class and return the handle property to this event as the result.

8.1.24 ApplicationHidden

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: The application was hidden.

Notes: Only used on Mac OS X 10.2 and newer.

8.1.25 ApplicationLaunched(ProcessSerial as memoryblock)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever an application is launched.

Notes: ProcessSerial is a memoryblock to 8 bytes defining the process serial number.

ProcessSerial may be nil on very low memory.

8.1.26 ApplicationQuit

Plugin Version: 5.3, Platform: macOS, Targets: .

Function: The application is requested to quit.

Notes: Current Xojo versions seems to handle this event before the plugin can get it, so currently this event does not fire. (tested with RB 5.5 and 2005r2)

8.1.27 ApplicationShown

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: The application was shown.

Notes: Only used on Mac OS X 10.2 and newer.

8.1.28 ApplicationSwitched(ProcessSerial as memoryblock)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the frontmost application is changed.

Example:

```
sub ApplicationSwitched(ProcessSerial as memoryblock)
```

```
' This even works in built applications.
```

```
dim s as String
```

```
dim p as ProcessMBS
```

```

if ProcessSerial<>nil then
p=new ProcessMBS

p.GetProcess(ProcessSerial)
p.Update
s=p.Name
end if
List.InsertRow 0,"Application switched to "+s+"
end sub

```

Notes: ProcessSerial is a memoryblock to 8 bytes defining the process serial number. ProcessSerial may be nil on very low memory.

8.1.29 ApplicationSystemUIModeChanged(SystemUIMode as Integer)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: The system UI mode changed.

Notes: Only used on Mac OS X 10.2 and newer.

8.1.30 ApplicationTerminated(ProcessSerial as memoryblock)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever an application quits.

Notes: ProcessSerial is a memoryblock to 8 bytes defining the process serial number.

ProcessSerial may be nil on very low memory.

Note that the process serial number may no longer be valid when this event is called.

8.1.31 GestureEnded(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called when the gesture ends.

Notes: GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See Window-

PartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.1.32 GestureMagnify(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, MagnificationAmount as Double) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called several times while the magnify gesture is performed.

Notes: MagnificationAmount the magnification amount.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

Return true if you handled the event.

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.1.33 GestureRotate(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, RotationAmount as Double) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called several times while the rotation gesture is performed.

Notes: The RotationAmount in polar coordinates.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.1.34 GestureStarted(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called when a gesture starts.

Notes: GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.1.35 GestureSwipe(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, SwipeDirectionX as Double, SwipeDirectionY as Double) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called for a swipe gesture.

Notes: SwipeDirectionX and SwipeDirectionY specify the swipe direction.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.1.36 HotKeyPressed(signature as Integer, id as Integer)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: The hotkey was pressed.

8.1.37 HotKeyReleased(signature as Integer, id as Integer)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: The hotkey was released.

Notes: Works not on Carbon inside Mac OS 9!

8.1.38 KeyboardRawKeyDown(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

Plugin Version: 3.2, Platform: macOS, Targets: .

Function: A key was pressed.

Notes: Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead. If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.1.39 KeyboardRawKeyModifiersChanged(modifierkeys as Integer) as boolean

Plugin Version: 3.2, Platform: macOS, Targets: .

Function: The state of the modifier keys changed.

Notes: Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead. If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.1.40 KeyboardRawKeyRepeat(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

Plugin Version: 3.2, Platform: macOS, Targets: .

Function: A key is still down.

Notes: Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead. If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.1.41 KeyboardRawKeyUp(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

Plugin Version: 3.2, Platform: macOS, Targets: .

Function: A key was released.

Notes: Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead.

If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.1.42 MenuPopulate(MenuHandle as Integer)

Plugin Version: 4.0, Platform: macOS, Targets: .

Function: The system asks the application to update the menu bar.

Notes: The application can change the menubar just a second before the user sees it.

This event is also sent whenever a command key is searched.

Works on CarbonLib 1.6 or newer.

Added MenuHandle parameter in v5.2.

8.1.43 MouseDown(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 3.4, Platform: macOS, Targets: .

Function: An event which fires when a mousebutton is down.

Notes: In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.1.44 **MouseDowned(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean**

Plugin Version: 3.4, Platform: macOS, Targets: .

Function: An event which fires when the mouse is dragged.

Notes: In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.1.45 **MouseMove(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single) as boolean**

Plugin Version: 3.4, Platform: macOS, Targets: .

Function: An event which fires when the mouse is moved.

Notes: In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.1.46 **MouseUp(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean**

Plugin Version: 3.4, Platform: macOS, Targets: .

Function: An event which fires when a mousebutton is released.

Notes: In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.1.47 MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the mouse wheel is moved.

Example:

```
function MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean
dim d as Integer
```

```
const cmdKey=256
const shiftKey=512
const alphaLock=1024
const optionKey=2048
const controlKey=4096
const rightShiftKey=8192
const rightOptionKey=16384
const rightControlKey=32768
```

```
const kEventMouseWheelAxisY=1
const kEventMouseWheelAxisX=0
```

```
if axis=kEventMouseWheelAxisY then
d=delta
```

```
if BitwiseAnd(modifierKeys,optionkey)<>0 then
d=d*4 // scroll faster with option
end if
```

```
List.ScrollPosition=List.ScrollPosition-d
end if
```

```
List.InsertRow 0,"MouseWheelMoved "+str(delta)
end function
```

Notes: Currently axis is only 0 or 1, but in future new input devices may have up to 32 axes.

Added a boolean function result in version 3.2. If you return true the event is handled by you. Else it's passed to the next receiver of events.

8.1.48 ProcessCommand(AttributeFlags as Integer, CommandId as Integer, Handle as Integer, Index as Integer) as boolean

Plugin Version: 3.0, Platform: macOS, Targets: .

Function: Called whenever a command is to process.

Notes: Called for example when the DockTileMenu is used.

It seems like handle and index are optional.

Renamed Attributes parameter to AttributeFlags in plugin version 8.2.

8.1.49 ServiceCopy(Scrap as CarbonEventsScrapMBS) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever a service needs something from you.

Notes: You have to fill the scrap.

Return true if you handled the event.

8.1.50 ServiceGetTypes(copytypes as CFMutableArrayMBS, pastetypes as CFMutableArrayMBS) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the Mac OS needs to know what types you can process.

Example:

```
function ServiceGetTypes(copytypes as CFMutableArrayMBS, pastetypes as CFMutableArrayMBS) as boolean
  pastetypes.Append me.CreateTypeStringWithOSType("TEXT") // Speak text
  pastetypes.Append me.CreateTypeStringWithOSType("TIFF") // for Grab

  copytypes.Append me.CreateTypeStringWithOSType("TEXT")
end function
```

Notes: Fill the arrays with your content type codes.

Use the CreateTypeStringWithOSType function to make strings with the type codes.

Return true if you handled the event.

8.1.51 ServicePaste(Scrap as CarbonEventsScrapMBS) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever a service gives something to you.

Notes: You have to do something with the content of the scrap.
Return true if you handled the event.

8.1.52 ServicePerform(Scrap as CarbonEventsScrapMBS, MessageName as CFStringMBS, UserData as CFStringMBS) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever you should perform a service.

Notes: You have to do something with the content of the scrap.
Return true if you handled the event.

8.1.53 VolumeMounted(VolumeRefNum as Integer, VolumeRoot as FolderItem)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever a volume is mounted.

Example:

```
sub VolumeMounted(VolumeRefNum as Integer)
  dim s as String
  dim f as FolderItem

  f=NewVolumeFolderitemMBS(VolumeRefNum)
  if f<>nil then
    s=f.DisplayName
  end if

  List.InsertRow 0,"A volume was mounted: "+s
end sub
```

Notes: VolumeRefNum is the number of the mounted volume. You may keep a list of mounted volumes if you need to know which was is unmounted later.

8.1.54 VolumeUnmounted(VolumeRefNum as Integer)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever a volume is unmounted.

Example:

```
sub VolumeUnmounted(VolumeRefNum as Integer)
// If you keep a list you can identify the volume...
List.InsertRow 0,"A volume was unmounted."
end sub
```

Notes: VolumeRefNum is the number of the mounted volume. You may keep a list of mounted volumes if you need to know which was is unmounted later.

8.2 class CarbonEventsIdleTimerMBS

8.2.1 class CarbonEventsIdleTimerMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. **Function:** A class for an idle timer. **Notes:** An idle timer is called whenever the user didn't use the mouse or the keyboard for a given time period.

Blog Entries

- [MBS Xojo Plugins, version 23.3pr7](#)
- [MBS Xojo Plugins, version 19.1pr2](#)

8.2.2 Methods

8.2.3 Constructor(delay as Double, interval as Double)

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Installs an idle timer.

Notes: Idle timers are only called when there is no user activity occurring in the application. This means that the user is not actively clicking/typing, and is also not in the middle of tracking a control, menu, or window. TrackMouseLocation actually disables all idle timers automatically for you.

Parameters:

delay:

The delay before firing this timer after a user input event has come in. For example, if you want to start your timer 2 seconds after the user stops typing, etc. you would pass 2.0 into this parameter. Each time the user types a key (or whatever), this timer is reset. If we are considered to be idle when an idle timer is installed, the first time it fires will be inDelay seconds from the time it is installed. So if you installed it in the middle of control tracking, say, it wouldn't fire until the user stopped tracking. But if you installed it at app startup and the user hasn't typed/clicked, it would fire in delay seconds.

interval:

The timer interval (pass 0 for a one-shot timer, which executes once but does not repeat). You may also pass kEventDurationForever (-1) to create a one-shot timer.

In older plugins this was called Create, but later changed to Constructor to make usage easier.

8.2.4 Properties

8.2.5 Available as Boolean

Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

Function: True if this timer can work.

Notes: Should always be true on Mac OS X and false on Windows or Mac OS Classic.

Changed in 19.1 from regular to shared property.

(Read only property)

8.2.6 Lasterror as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The last error code reported.

Notes: 0 for successfull.

-1 for function not available.

else a Mac OS error code.

(Read and Write property)

8.2.7 Events

8.2.8 Action(state as Integer)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: Called when an idle timer fires.

Notes: Constants for state:

The user has gone idle (not touched an input device) for the duration specified in your idle timer. This is the first message you will receive. Start your engines!

```
kEventLoopIdleTimerStarted = 1
```

If you specified an interval on your idle timer, your idle timer proc will be called with this message, letting you know it is merely firing at the interval specified. If you did not specify an interval, this message is not sent.

```
kEventLoopIdleTimerIdling = 2
```

The user is back! Stop everything! This is your cue to stop any processing if you need to.

kEventLoopIdleTimerStopped = 3

8.3 class CarbonEventsScrapMBS

8.3.1 class CarbonEventsScrapMBS

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. You can use NSPasteboardMBS for Cocoa instead. **Function:** A class for a clipboard used for the carbon service events.

Notes: This is Carbon API. You may want to prefer NSPasteboardMBS class for new projects.

Blog Entries

- [Cleanup Xojo Plugins](#)
- [MBS Xojo Plugins, version 19.4pr1](#)
- [MBS Real Studio Plugins, version 12.4pr1](#)
- [Teaser: Clipboard classes](#)

8.3.2 Methods

8.3.3 AddData(FlavorType as string,data as string)

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Adds data to the scrap.

8.3.4 AddText(Text as string)

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Adds plain text to the scrap.

8.3.5 AddUnicodeText(Text as string)

Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

Function: Adds 16bit unicode text to the scrap.

Notes: Your string must be in 16 bit unicode. Else you may run into crashes.

8.3.6 clear

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Clears the scrap.

8.3.7 DataAvailable(FlavorType as string) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Looks whether data is available or not for this type.

Notes: This function is much faster then if you use datasize.

Returns false on any error.

8.3.8 DataSize(FlavorType as string) as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Returns the data size of an item in the scrap.

Notes: Some data provider generate the data for the scrap only if you read it, so this function may be slower than just DataAvailable.

Returns 0 on any error.

8.3.9 FlavorCount as Integer

Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

Function: The number of flavor in the clipboard.

Notes: Calling this function recreates the internal flavor list.

8.3.10 FlavorFlags(index as Integer) as Integer

Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

Function: Returns the flags of the given flavor.

Notes: Index goes from 0 to count-1.

Returns 0 on any error.

Flags are a combination of type values:

1 - private data (Sender only)

2 - translated data

8.3.11 FlavorType(index as Integer) as string

Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

Function: Returns the type of the given flavor.

Notes: Index goes from 0 to count-1.

Returns "" on any error.

8.3.12 GetData(FlavorType as string) as string

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Returns the data of an item in the scrap.

Notes: Some data provider generate the data for the scrap only if you read it, so this function may be slower than just DataAvailable.

Returns "" on any error.

8.3.13 GetFile(byref file as folderitem) as boolean

Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

Function: Tries to get a file reference from the scrap.

Notes: Returns true on success and false on failure.

On newer Mac OS X versions with 12.4 plugin, we fixed this function. But there we can't provide type, creator and flags.

See also:

- 8.3.14 GetFile(byref file as folderitem, byref type as string, byref creator as string, byref flags as Integer) as boolean 220

8.3.14 GetFile(byref file as folderitem, byref type as string, byref creator as string, byref flags as Integer) as boolean

Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

Function: Tries to get a file reference from the scrap.

Notes: Returns true on success and false on failure.

Type and Creator are the Mac OS 9 file types.

flags are the normal Finderflags as you get them if using GetFileFlagsMBS(file).

On newer Mac OS X versions with 12.4 plugin, we fixed this function. But there we can't provide type, creator and flags.

See also:

- 8.3.13 GetFile(byref file as folderitem) as boolean

8.3.15 GetText as string

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Returns the plain text from the scrap.

Notes: Some data provider generate the data for the scrap only if you read it, so this function may be slower than just TextAvailable.

Returns "" on any error.

8.3.16 GetUnicodeText as string

Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

Function: Returns the unicode text from the scrap.

Notes: Some data provider generate the data for the scrap only if you read it, so this function may be slower than just TextAvailable.

Returns "" on any error.

8.3.17 PictAvailable as boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Looks whether Mac PICT data is available.

Notes: Returns false on any error.

8.3.18 TextAvailable as boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Like Dataavailable, but just for text.

Notes: This function is much faster then if you use Textsize.

Checks only for plain TEXT, not for unicode or styled text.

Returns false on any error.

8.3.19 TextSize as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Like `DataSize`, but just for text.

Notes: Checks only for plain TEXT, not for unicode or styled text.
Returns 0 on any error.

8.3.20 `UnicodeTextAvailable` as boolean

Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

Function: True if unicode text is available.

Notes: This function is much faster than if you use `UnicodeTextsize`.
Returns false on any error.

8.3.21 `UnicodeTextSize` as Integer

Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

Function: Returns the number of available characters in the unicode string part of the scrap.

Notes: Returns 0 on any error.

8.3.22 `Properties`

8.3.23 `Handle` as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The handle to the scrap.

Notes: (Read and Write property)

8.3.24 `Release` as Boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Whether the destructor should destroy the handle later.

Notes: (Read and Write property)

8.4 class CarbonEventsTabletPointMBS

8.4.1 class CarbonEventsTabletPointMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. **Function:** A class for details about the current point information.

Blog Entries

- [MBS Xojo Plugins, version 23.3pr7](#)

8.4.2 Properties

8.4.3 AbsX as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Absolute x coordinate in tablet space at full tablet resolution.

Notes: (Read and Write property)

8.4.4 AbsY as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Absolute y coordinate in tablet space at full tablet resolution.

Notes: (Read and Write property)

8.4.5 AbsZ as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Absolute z coordinate in tablet space at full tablet resolution.

Notes: (Read and Write property)

8.4.6 Buttons as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Which buttons are pressed.

Notes: One bit per button - bit 0 is first button - 1 = closed.

(Read and Write property)

8.4.7 DeviceID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: System-assigned unique device ID - matches to deviceID field in proximity event.

Notes: (Read and Write property)

8.4.8 Pressure as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Scaled pressure value.

Notes: MAXPRESSURE= $(2^{16})-1$, MINPRESSURE=0.

(Read and Write property)

8.4.9 Rotation as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Fixed-point representation of device rotation in a 10.6 format.

Notes: (Read and Write property)

8.4.10 TangentialPressure as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Tangential pressure on the device; range same as tilt.

Notes: (Read and Write property)

8.4.11 TiltX as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Scaled tilt x value.

Notes: range is $-((2^{15})-1)$ to $(2^{15})-1$ (-32767 to 32767)

(Read and Write property)

8.4.12 TiltY as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Scaled tilt y value.

Notes: range is $-(2^{15}-1)$ to $(2^{15}-1)$ (-32767 to 32767).
(Read and Write property)

8.4.13 Vendor1 as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined signed 16-bit integer.

Notes: (Read and Write property)

8.4.14 Vendor2 as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined signed 16-bit integer.

Notes: (Read and Write property)

8.4.15 Vendor3 as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined signed 16-bit integer.

Notes: (Read and Write property)

8.5 class CarbonEventsTabletProximityMBS

8.5.1 class CarbonEventsTabletProximityMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. **Function:** A class for the tablet proximity details.

Blog Entries

- [MBS Xojo Plugins, version 23.3pr7](#)

8.5.2 Properties

8.5.3 CapabilityMask as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Mask representing the capabilities of the device.

Notes: Unsigned 32 bit integer.

(Read and Write property)

8.5.4 DeviceID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: System-assigned unique device ID - matches to deviceID field in tablet event.

Notes: Unsigned 16 bit integer.

(Read and Write property)

8.5.5 EnterProximity as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Whether the pen entered or was leaving.

Notes: non-zero = entering; zero = leaving

(Read and Write property)

8.5.6 PointerID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined ID of the specific pointing device.

Notes: Unsigned 16 bit integer.

(Read and Write property)

8.5.7 PointerSerialNumber as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined serial number of the specific pointing device.

Notes: Unsigned 32 bit integer.

(Read and Write property)

8.5.8 PointerType as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Type of pointing device.

Notes: No values defined for this function by Apple.

Unsigned 8 bit integer.

(Read and Write property)

8.5.9 SystemTabletID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: System-assigned unique tablet ID.

Notes: Unsigned 16 bit integer.

(Read and Write property)

8.5.10 TabletID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined tablet ID - typically will be USB product ID for the tablet.

Notes: Unsigned 16 bit integer.

(Read and Write property)

8.5.11 UniqueID as Memoryblock

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined unique ID for this pointer.

Notes: A 64bit integer value stored in an eight byte memoryblock.
(Read and Write property)

8.5.12 VendorID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined ID - typically will be USB vendor ID.

Notes: Unsigned 16 bit integer.
(Read and Write property)

8.5.13 VendorPointerType as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Vendor-defined pointer type.

Notes: Unsigned 16 bit integer.
(Read and Write property)

8.6 class CarbonEventsTimerMBS

8.6.1 class CarbonEventsTimerMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. **Function:** A class for a Carbon timer. **Notes:** Compare to a Xojo timer, the CarbonEventsTimerMBS will fire more often, for example if a menu is open.

8.6.2 Methods

8.6.3 Constructor

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Creates a new timer.

Notes: Lasterror is set.

In older plugins this was called Create, but later changed to Constructor to make usage easier.

8.6.4 Properties

8.6.5 Available as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Whether the time can fire.

Notes: Should be true in Carbon applications.

(Read only property)

8.6.6 Lasterror as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The last error code reported.

Notes: 0 for successful.

-1 for function not available.

else a Mac OS error code.

(Read and Write property)

8.6.7 Mode as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The timer mode.

Notes: Like a RB timer: 0 - off, 1 - single, 2 - multiple.

The timer may fire directly when set.

(Read and Write property)

8.6.8 Period as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The period of the timer in milliseconds.

Notes: Added to make it compatible to normal RB code.

(Read and Write property)

8.6.9 PeriodSeconds as Double

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The period of the timer in seconds.

Notes: Set to 1 to fire the timer every second.

If you set this to 0.000001, you can get something like 13500 events per second. See Timer Benchmark example project.

(Read and Write property)

8.6.10 Events

8.6.11 Action

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: Called whenever the timer fires.

Notes: There seems to be a bug in some RB versions:

If you draw into a window in this timer's action event, you may draw not in the window graphics port, but in the current graphics port. If you click on the menubar to open a menu, you draw over this menu.

To work around this you can add a line before drawing: `TheWindow.Show`

8.7 class CarbonHotKeyMBS

8.7.1 class CarbonHotKeyMBS

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. You can use HotKeyMBS instead.

Function: A class for creating hot keys.

Example:

```

const activeFlag = 1
const btnState = 128
const cmdKey = 256
const shiftKey = 512
const alphaLock = 1024
const optionKey = 2048
const controlKey = 4096
const rightShiftKey = 8192
const rightOptionKey = 16384
const rightControlKey = 32768

dim MyEvents1 as CarbonApplicationEventsMBS
// use a global property to store your instance of your subclass
dim p as CarbonHotKeyMBS // this should also be global

MyEvents1.Listen

p=new CarbonHotKeyMBS
p.AddKey(&h24, optionKey, OSTypeFromStringMBS("MBSG"), 5)

if p.LastError<>0 then
MsgBox "The Hotkey could not be registered!"
end if

// key will be released when p is destroyed on closing the window.
```

Notes: The CarbonHotKeyMBS has carbon in the name, but works fine with Cocoa, too. The Cocoa event handling system is based internally on the Carbon event handling. If you need to catch NSEvents, please use NSEventMonitorMBS class.

Blog Entries

- [MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2](#)

Xojo Developer Magazine

- [13.5, page 8: News](#)

8.7.2 Methods

8.7.3 AddKey(keycode as Integer, keymodifier as Integer, hotkeysignature as Integer, hotkeyid as Integer)

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Creates a hot key binding.

Notes: Please use only one CarbonHotKeyMBS object for each hotkey you want to use.

Keycode is the same keycode as for the sprite surface.

Possible values for the key modifier:

activeFlag = 1

btnState = 128

cmdKey = 256

shiftKey = 512

alphaLock = 1024

optionKey = 2048

controlKey = 4096

rightShiftKey = 8192

rightOptionKey = 16384

rightControlKey = 32768

The Signature should be unique. Best if you use your application's creator code.

The ID is for your application to check which hot key was pressed in the HotKey events of the CarbonApplicationEventsMBS class.

Some keycode values:

8.7.4 RemoveKey

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Removes the hot key binding.

Notes: Called by the destructor if you don't call it.

8.7.5 Properties

8.7.6 HotKeyID as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The ID used for this hotkey.

Notes: (Read only property)

8.7.7 HotKeyRef as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The handle for this hotkey.

Notes: Used internally for releasing it later.

(Read only property)

8.7.8 HotKeySignature as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The Signature used for this hotkey.

Notes: The signature should be the creator code of your application to make it unique.

(Read only property)

8.7.9 KeyCode as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The keycode used for this hotkey.

Notes: (Read only property)

8.7.10 KeyModifier as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The KeyModifier used for this hotkey.

Notes: (Read only property)

8.7.11 LastError as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The last Mac OS error code reported from one of the functions.

Notes: (Read only property)

kVK_A	= &h00
kVK_S	= &h01
kVK_D	= &h02
kVK_F	= &h03
kVK_H	= &h04
kVK_G	= &h05
kVK_Z	= &h06
kVK_X	= &h07
kVK_C	= &h08
kVK_V	= &h09
kVK_B	= &h0B
kVK_Q	= &h0C
kVK_W	= &h0D
kVK_E	= &h0E
kVK_R	= &h0F
kVK_Y	= &h10
kVK_T	= &h11
kVK_1	= &h12
kVK_2	= &h13
kVK_3	= &h14
kVK_4	= &h15
kVK_6	= &h16
kVK_5	= &h17
kVK_Equal	= &h18
kVK_9	= &h19
kVK_7	= &h1A
kVK_Minus	= &h1B
kVK_8	= &h1C
kVK_0	= &h1D
kVK_RightBracket	= &h1E
kVK_O	= &h1F
kVK_U	= &h20
kVK_LeftBracket	= &h21
kVK_I	= &h22
kVK_P	= &h23
kVK_L	= &h25
kVK_J	= &h26
kVK_Quote	= &h27
kVK_K	= &h28
kVK_Semicolon	= &h29
kVK_Backslash	= &h2A
kVK_Comma	= &h2B
kVK_Slash	= &h2C
kVK_N	= &h2D
kVK_M	= &h2E
kVK_Period	= &h2F
kVK_Grave	= &h32
kVK_KeypadDecimal	= &h41
kVK_KeypadMultiply	= &h43
kVK_KeypadPlus	= &h45
kVK_KeypadClear	= &h47
kVK_KeypadDivide	= &h4B
kVK_KeypadEnter	= &h4C
kVK_KeypadMinus	= &h4E
kVK_KeypadEquals	= &h51
kVK_Keypad0	= &h52
kVK_Keypad1	= &h53
kVK_Keypad2	= &h54
kVK_Keypad3	= &h55

8.8 class CarbonMonitorEventsMBS

8.8.1 class CarbonMonitorEventsMBS

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. **Function:** A class for receiving events sent to the application while monitoring events.

Notes: The CarbonMonitorEventsMBS class is a special class used to monitor user input events across all processes. When such a class is listening, the Carbon Event Manager examines the event type for user input event types, such as mouse-down, mouse-up, key-down, and so forth. It then requests that the WindowServer make copies of any of these events that are sent to any process, and deliver them to the current process also. These events are queued into the main thread's event queue, and during normal event dispatching are sent directly to the event handlers installed on the event monitor class. Monitored events are not sent through the normal event dispatching path for the current process; they will pass through the event dispatcher target, and will then be sent directly to the event monitor target.

Handlers installed on the event monitor class will only receive events when the current application is inactive. When the current application is active, all event flow occurs through the event dispatcher target, and no events are sent to the event monitor target.

Currently, the event monitor supports the following event kinds: kEventRawKeyDown, kEventRawKeyUp, kEventRawKeyRepeat, kEventRawKeyModifiersChanged, kEventMouseDown, kEventMouseUp, kEventMouseMove, kEventMouseDragged, kEventMouseWheelMoved, kEventTabletPoint, and kEventTabletProximity.

Note that both Carbon and Cocoa password edit text controls enable a secure input mode while the focus is on the control, which prevents keyboard events from being passed to other applications. This prevents the monitoring event target from being used to sniff password keystrokes.

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

Accessibility made need to be turned on. On Mac OS X 10.9 this may not work in debug apps, but only in build apps after second launch.

Blog Entries

- [MBS Xojo Plugins, version 23.3pr7](#)

8.8.2 Methods

8.8.3 Listen

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: Starts listening for events send to your application.

8.8.4 Properties

8.8.5 Available as Boolean

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: Whether this events are firing.

Notes: Still each event may have it's own requirement.

(Read only property)

8.8.6 EventCount as Integer

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse event counter.

Notes: Increases whenever one of the following events occurs:

MouseDown, MouseDragged and MouseUp.

(Read and Write property)

8.8.7 Lasterror as Integer

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The last reported Mac OS error code.

Notes: 0 if successfull, -1 if function is not available.

(Read and Write property)

8.8.8 MouseButton as Integer

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse buttons used at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

8.8.9 MouseChord as Integer

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse chord state at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

8.8.10 MouseClickCount as Integer

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse click count at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

8.8.11 MouseDeltaX as Single

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse movement at the time of the last mouse event.

Notes: Set by the MouseMoved and the MouseDragged event.

(Read and Write property)

8.8.12 MouseDeltaY as Single

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse movement at the time of the last mouse event.

Notes: Set by the MouseMoved and the MouseDragged event.

(Read and Write property)

8.8.13 MouseModifierKeys as Integer

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The modifier key state at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

The modifiers field contains information about the state of the modifier keys and the mouse button at the time the event was posted.

Each of the modifier keys is represented by a specific bit in the modifiers field. You can use these constants as masks to test the setting of various bits in the modifiers field:

activeFlag	1	set if window being activated or if mouse-down event caused foreground switch
btnState	128	set if mouse button up
cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

If your application attaches special meaning to any of these keys in combination with other keys or when the mouse button is down, you can test the state of the modifiers field to determine the action your application should take. For example, you can use this information to determine whether the user pressed the Command key and another key to make a menu choice.

Some keyboards do not distinguish between the right or left Control, Shift, and Option keys; for example, the virtual key code for the right Shift key and left Shift key might be the same. For these keyboards, if the user presses the Control, Shift, or Option key, the Event Manager sets only the bits corresponding to the shiftKey, optionKey, and controlKey constants. For keyboards that do distinguish between these keys, the Event Manager sets the bits in the modifiers field to indicate whether the right or left Control, Shift, or Option keys were pressed. For example, the Event Manager sets bit 13 in the modifiers field if the user presses the right Shift key and sets bit 9 if the user presses the left Shift key. In most cases your application should not need to distinguish between the left and right Control, Shift, and Option keys.

(Read and Write property)

8.8.14 MouseX as Single

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse position at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

8.8.15 MouseY as Single

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: The mouse position at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.8.16 Tablet as Boolean

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: Whether you want to get the tablet event data.

Notes: As not every application needs tablet event information, this is optional.
Set to true to get the TabletPoint and TabletProximity parameters filled in the events.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.8.17 TabletPoint as CarbonEventsTabletPointMBS

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: Saves the current tablet point object.

Notes: Whenever an event is received and the tablet property is true and there is point information available, a reference to the CarbonEventsTabletPointMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.8.18 TabletProximity as CarbonEventsTabletProximityMBS

Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

Function: Saves the current tablet proximity object.

Notes: Whenever an event is received and the tablet property is true and there is proximity information available, a reference to the CarbonEventsTabletProximityMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.8.19 Events

8.8.20 KeyboardRawKeyDown(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: A key was pressed.

Notes: If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

8.8.21 KeyboardRawKeyModifiersChanged(modifierkeys as Integer) as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: The state of the modifier keys changed.

Notes: If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

For added security, `GetEventMonitorTarget` requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor `RawKeyDown`, `RawKeyUp`, and `RawKeyRepeat` events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

8.8.22 `KeyboardRawKeyRepeat(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer)` as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: A key is still down.

Notes: If you return true you tell the system that you handled the event.

Possible values for the key modifier:

For added security, `GetEventMonitorTarget` requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor `RawKeyDown`, `RawKeyUp`, and `RawKeyRepeat` events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.8.23 KeyboardRawKeyUp(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: A key was released.

Notes: If you return true you tell the system that you handled the event.

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

For added security, `GetEventMonitorTarget` requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor `RawKeyDown`, `RawKeyUp`, and `RawKeyRepeat` events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

8.8.24 `MouseDown(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer)` as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: An event which fires when a mousebutton is down.

Notes: In case the tablet property is true, the `TabletPoint` or the `TabletProximity` property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.8.25 `MouseDragged(x as single, y as single, modifierKeys as Integer, deltax as single, deltax as single, button as Integer, clickcount as Integer, MouseChord as Integer)` as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: An event which fires when the mouse is dragged.

Notes: In case the tablet property is true, the `TabletPoint` or the `TabletProximity` property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.8.26 `MouseMove(x as single, y as single, modifierKeys as Integer, deltax as single, deltax as single)` as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: An event which fires when the mouse is moved.

Notes: In case the tablet property is true, the `TabletPoint` or the `TabletProximity` property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.8.27 `MouseUp(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer)` as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: An event which fires when a mousebutton is released.

Notes: In case the tablet property is true, the `TabletPoint` or the `TabletProximity` property is filled with

an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.8.28 MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean

Plugin Version: 4.3, Platform: macOS, Targets: .

Function: Called whenever the mouse wheel is moved.

Example:

```
function MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean
dim d as Integer
```

```
const cmdKey=256
const shiftKey=512
const alphaLock=1024
const optionKey=2048
const controlKey=4096
const rightShiftKey=8192
const rightOptionKey=16384
const rightControlKey=32768
```

```
const kEventMouseWheelAxisY=1
const kEventMouseWheelAxisX=0
```

```
if axis=kEventMouseWheelAxisY then
d=delta
```

```
if BitwiseAnd(modifierKeys,optionkey)<>0 then
d=d*4 // scroll faster with option
end if
```

```
List.ScrollPosition=List.ScrollPosition-d
end if
```

```
List.InsertRow 0,"MouseWheelMoved "+str(delta)
end function
```

Notes: Currently axis is only 0 or 1, but in future new input devices may have up to 32 axes.

Added a boolean function result in version 3.2. If you return true the event is handled by you. Else it's passed to the next receiver of events.

8.9 class CarbonSystemEventsMBS

8.9.1 class CarbonSystemEventsMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. **Function:** A class for receiving system events sent to the application.

Blog Entries

- [MBS Xojo Plugins, version 23.3pr7](#)
- [MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2](#)

8.9.2 Methods

8.9.3 Listen

Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

Function: Starts listening for events send to your application.

8.9.4 Properties

8.9.5 Available as Boolean

Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

Function: Whether this events are firing.

Notes: Still each event may have it's own requirement.

(Read only property)

8.9.6 Lasterror as Integer

Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

Function: The last reported Mac OS error code.

Notes: 0 if successfull, -1 if function is not available.

(Read and Write property)

8.9.7 Events

8.9.8 DisplayReconfigured

Plugin Version: 9.2, Platform: macOS, Targets: .

Function: Notification that the Display configuration has changed.

Notes: This event is sent to all handlers registered for it on the application event target. When this event is received, applications may wish to update geometry and color depth usage or perform a redraw based on the new configuration.

Sent in Mac OS X 10.5 and newer.

8.9.9 DisplaysAsleep

Plugin Version: 9.2, Platform: macOS, Targets: .

Function: All connected displays have gone to sleep.

Notes: Sent in Mac OS X 10.4 and newer.

8.9.10 DisplaysAwake

Plugin Version: 9.2, Platform: macOS, Targets: .

Function: All connected displays have awoken.

Notes: Sent in Mac OS X 10.4 and newer.

8.9.11 TimeDateChanged

Plugin Version: 4.0, Platform: macOS, Targets: .

Function: The system time and/or date has changed via the preferences panel.

Notes: Requires Mac OS X 10.3 or newer.

The RB date class may not recognize the case when just the time zone changed.

8.9.12 UserSessionActivated

Plugin Version: 4.0, Platform: macOS, Targets: .

Function: The current user login session has been activated.

Notes: Requires Mac OS X 10.3 or newer.

From Apple's documentation:

When a user switch occurs, Mac OS X generates events for all interested applications. Events are sent to applications in a login session whenever the login session is activated or deactivated. If a login session is not being activated or deactivated, it receives no events. You can use the activation events to perform the following kinds of tasks:

- Halt or restart sound playback
- Halt or restart animations
- Give up or acquire shared resources
- Put your application into a quiescent state to improve overall system performance

Event Timing

User switch notifications are sent to applications at the same time the switch occurs. Because the switch occurs relatively quickly, this is normally not a problem. However, it is possible for an application to receive its activation event before other applications have received their deactivation events. This could lead to potential race conditions between applications releasing and acquiring shared resources.

To avoid race conditions, applications in the session being deactivated should continue to release any shared resources as soon as possible. Applications in the session being activated should delay the acquisition of any shared resources until those resources are actually used. Not only can this help avoid potential race conditions, it can also improve overall system performance. If your application needs a particular resource right away but encounters errors while trying to acquire it, set a timer and try to acquire the resource again a short time later.

8.9.13 UserSessionDeactivated

Plugin Version: 4.0, Platform: macOS, Targets: .

Function: The current user login session has been deactivated.

Notes: Requires Mac OS X 10.3 or newer.

From Apple's documentation:

When a user switch occurs, Mac OS X generates events for all interested applications. Events are sent to applications in a login session whenever the login session is activated or deactivated. If a login session is not being activated or deactivated, it receives no events. You can use the activation events to perform the following kinds of tasks:

- Halt or restart sound playback
- Halt or restart animations
- Give up or acquire shared resources
- Put your application into a quiescent state to improve overall system performance

Event Timing

User switch notifications are sent to applications at the same time the switch occurs. Because the switch occurs relatively quickly, this is normally not a problem. However, it is possible for an application to receive its activation event before other applications have received their deactivation events. This could lead to potential race conditions between applications releasing and acquiring shared resources.

To avoid race conditions, applications in the session being deactivated should continue to release any shared resources as soon as possible. Applications in the session being activated should delay the acquisition of any shared resources until those resources are actually used. Not only can this help avoid potential race conditions, it can also improve overall system performance. If your application needs a particular resource right away but encounters errors while trying to acquire it, set a timer and try to acquire the resource again a short time later.

8.10 class CarbonWindowsEventsMBS

8.10.1 class CarbonWindowsEventsMBS

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Deprecated: This item is deprecated and should no longer be used. You can use `NSWindowDelegateMBS` for Cocoa instead. **Function:** A class for receiving events sent to a window.

Notes: Only for Carbon target. Will not work with Cocoa windows.

Blog Entries

- [Cleanup Xojo Plugins](#)
- [MBS Xojo Plugins, version 19.4pr1](#)
- [MBS Xojo / Real Studio Plugins, version 14.0pr2](#)
- [Gestures on Mac OS X](#)
- [MBS REALbasic Plugins, version 10.6pr4](#)
- [Magic Mouse in REALbasic](#)

8.10.2 Methods

8.10.3 Listen(win as window)

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: Starts listening for events send to the given window.

8.10.4 ListenOnWindowsHandle(windowHandle as Integer)

Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

Function: Starts listening for events send to the given window.

Notes: You can use the `WindowHandle` from the `CocoaColorPanel` class.

8.10.5 Properties

8.10.6 Available as boolean

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: whether this events are firing.

Notes: (Read only property)

8.10.7 EventCount as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse event counter.

Notes: Increases whenever one of the following events occurs:

MouseUp, MouseMoved, MouseDragged and MouseDown.

(Read and Write property)

8.10.8 Lasterror as Integer

Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

Function: The last reported Mac OS error code.

Notes: 0 if successfull, -1 if function is not available.

(Read and Write property)

8.10.9 MouseButton as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse buttons used at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

8.10.10 MouseChord as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse chord state at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

8.10.11 MouseClickCount as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse click count at the time of the last mouse event.

Notes: Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.10.12 MouseDeltaX as Single

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse movement at the time of the last mouse event.

Notes: Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

8.10.13 MouseDeltaY as Single

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse movement at the time of the last mouse event.

Notes: Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

8.10.14 MouseModifierKeys as Integer

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The modifier key state at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

The modifiers field contains information about the state of the modifier keys and the mouse button at the time the event was posted.

Each of the modifier keys is represented by a specific bit in the modifiers field. You can use these constants as masks to test the setting of various bits in the modifiers field:

If your application attaches special meaning to any of these keys in combination with other keys or when the mouse button is down, you can test the state of the modifiers field to determine the action your application should take. For example, you can use this information to determine whether the user pressed the Command key and another key to make a menu choice.

Some keyboards do not distinguish between the right or left Control, Shift, and Option keys; for example, the virtual key code for the right Shift key and left Shift key might be the same. For these keyboards, if the user presses the Control, Shift, or Option key, the Event Manager sets only the bits corresponding to

activeFlag	1	set if window being activated or if mouse-down event caused foreground switch
btnState	128	set if mouse button up
cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

the shiftKey, optionKey, and controlKey constants. For keyboards that do distinguish between these keys, the Event Manager sets the bits in the modifiers field to indicate whether the right or left Control, Shift, or Option keys were pressed. For example, the Event Manager sets bit 13 in the modifiers field if the user presses the right Shift key and sets bit 9 if the user presses the left Shift key. In most cases your application should not need to distinguish between the left and right Control, Shift, and Option keys.
(Read and Write property)

8.10.15 MouseX as Single

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse position at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.10.16 MouseY as Single

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The mouse position at the time of the last mouse event.

Notes: Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

8.10.17 Tablet as Boolean

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Whether you want to get the tablet event data.

Notes: As not every application needs tablet event information, this is optional.
Set to true to get the TabletPoint and TabletProximity parameters filled in the events.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.10.18 TabletPoint as CarbonEventsTabletPointMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Saves the current tablet point object.

Notes: Whenever an event is received and the tablet property is true and there is point information available, a reference to the CarbonEventsTabletPointMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.10.19 TabletProximity as CarbonEventsTabletProximityMBS

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: Saves the current tablet proximity object.

Notes: Whenever an event is received and the tablet property is true and there is proximity information available, a reference to the CarbonEventsTabletProximityMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

8.10.20 Events**8.10.21 GestureEnded(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean**

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called when the gesture ends.

Notes: GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.10.22 GestureMagnify(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, MagnificationAmount as Double) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called several times while the magnify gesture is performed.

Notes: MagnificationAmount the magnification amount.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.10.23 GestureRotate(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, RotationAmount as Double) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called several times while the rotation gesture is performed.

Notes: The RotationAmount in polar coordinates.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.10.24 **GestureStarted(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean**

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called when a gesture starts.

Notes: GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

8.10.25 GestureSwipe(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, SwipeDirectionX as Double, SwipeDirectionY as Double) as boolean

Plugin Version: 9.0, Platform: macOS, Targets: .

Function: This event is called for a swipe gesture.

Notes: SwipeDirectionX and SwipeDirectionY specify the swipe direction.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

activeFlag	= 1	= &h000001
btnState	= 128	= &h000080
cmdKey	= 256	= &h000100
shiftKey	= 512	= &h000200
alphaLock	= 1024	= &h000400
optionKey	= 2048	= &h000800
controlKey	= 4096	= &h001000
rightShiftKey	= 8192	= &h002000
rightOptionKey	= 16384	= &h004000
rightControlKey	= 32768	= &h008000
NumLock	= 65536	= &h010000
Fn	= 131072	= &h020000

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

8.10.26 `MouseDown(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer)` as boolean

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: An event which fires when a mousebutton is down.

8.10.27 `MouseDragged(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single, button as Integer, clickcount as Integer, MouseChord as Integer)` as boolean

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: An event which fires when the mouse is dragged.

Notes: In case the tablet property is true, the `TabletPoint` or the `TabletProximity` property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.10.28 `MouseMoved(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single)` as boolean

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: An event which fires when the mouse is moved.

Notes: In case the tablet property is true, the `TabletPoint` or the `TabletProximity` property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.10.29 `MouseUp(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer)` as boolean

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: An event which fires when a mousebutton is released.

Notes: In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

8.10.30 MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the mouse wheel is moved with the mouse cursor within your window.

Example:

```
function MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean
dim d as Integer
```

```
const cmdKey=256
const shiftKey=512
const alphaLock=1024
const optionKey=2048
const controlKey=4096
const rightShiftKey=8192
const rightOptionKey=16384
const rightControlKey=32768
```

```
const kEventMouseWheelAxisY=1
const kEventMouseWheelAxisX=0
```

```
if axis=kEventMouseWheelAxisY then
d=delta
```

```
if BitwiseAnd(modifierKeys,optionkey)<>0 then
d=d*4 // scroll faster with option
end if
```

```
List.ScrollPosition=List.ScrollPosition-d
end if
```

```
List.InsertRow 0,"MouseWheelMoved "+str(delta)
end function
```

Notes: Currently axis is only 0 or 1, but in future new input devices may have up to 32 axes.

8.10.31 WindowBoundsChanging(original as object, previous as object, current as object, flags as Integer)

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window changes its bounds.

Notes: You may need to cast the objects to IntegerRectMBS objects.

8.10.32 WindowClickCloseRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the close button area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.33 WindowClickCollapseRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the collapse button area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.34 WindowClickContentRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the content area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.35 WindowClickDragRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the drag area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.36 WindowClickProxyIconRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the proxy icon area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.37 WindowClickResizeRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the resize widget area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.38 WindowClickStructureRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the window structure area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.39 WindowClickToolbarButtonRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the toolbar button area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.40 WindowClickZoomRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

Plugin Version: 11.0, Platform: macOS, Targets: .

Function: This event is called when the zoom button area of the window was clicked.

Notes: ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.

UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.

globalX and globalY: global mouse coordinates.

X and Y: mouse coordinates relative to window.

modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)

button: Which mouse button was pressed.

clickcount: Whether this is a single click, double click, etc.

MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

8.10.41 WindowClose as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window should close.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.42 WindowCloseAll as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever all windows should close.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.43 WindowCollapse as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called when the window is going to collapse.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.44 WindowCollapseAll as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called when all windows are going to collapse.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.45 WindowCollapsed as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window is collapsed.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.46 WindowCollapsing as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called while the window is collapsing.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.47 WindowExpand as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window should expand.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.48 WindowExpandAll as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever all windows should expand.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.49 WindowExpanded as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window is expanded.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.50 WindowExpanding as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called while the window is expanding.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.51 WindowHidden as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window is hidden.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.52 WindowHiding as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called while the window is hiding.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.53 WindowRestoreFromDock as boolean

Plugin Version: 7.4, Platform: macOS, Targets: .

Function: Called when the minimized window is clicked to be restored.

Notes: Return true to block this or return false to allow the restore to go on.

8.10.54 WindowShowing as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called while the window is showing.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.55 WindowShown as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window is shown.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.56 WindowToolbarButtonClicked as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the toolbar button is pressed.

Notes: Return true to tell the system that you handled this event. Else you may get this event two times on a metal window. (Boolean result added in plugin version 4.1)

8.10.57 WindowTransitionCompleted(TransitionAction as Integer, TransactionEffect as Integer)

Plugin Version: 6.5, Platform: macOS, Targets: .

Function: Called when a window transition completed.

8.10.58 WindowTransitionStarted(TransitionAction as Integer, TransactionEffect as Integer)

Plugin Version: 6.5, Platform: macOS, Targets: .

Function: Called when a window transition started.

8.10.59 WindowZoom as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window should zoom.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.60 WindowZoomAll as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever all windows should zoom.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

8.10.61 WindowZoomed as boolean

Plugin Version: 2.8, Platform: macOS, Targets: .

Function: Called whenever the window was zoomed.

Notes: Return false to run the default handler.

Return true to tell the system that you handled this event.

Chapter 9

ColorSync

9.1 module CSDeviceMBS

9.1.1 module CSDeviceMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: A module for device related Colorsync methods.

Blog Entries

- [MBS REALbasic Plugins, version 10.5pr5](#)

9.1.2 Methods

9.1.3 DeviceInfo(deviceClass as string, deviceID as CFUUIDMBS) as dictionary

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Queries information on the device.

Notes: Returns a dictionary with the following keys and values resolved for the current host and current user.

kColorSyncDeviceClass: camera, display, printer, scanner

kColorSyncDeviceID: CFUUIDRef registered with ColorSync

kColorSyncDeviceDescription: localized device description

kColorSyncDeviceUserScope: kCFPreferencesAnyUser or kCFPreferencesCurrentUser

kColorSyncDeviceHostScope: kCFPreferencesAnyHost or kCFPreferencesCurrentHost

kColorSyncFactoryProfiles: dictionary with ProfileID and kColorSyncCustomProfiles keys.

kColorSyncCustomProfiles: dictionary with keys ProfileID and values CFURLMBS or nil.

ProfileID is a dictionary with the following keys:

kColorSyncDeviceProfileURL: CFURLMBS or kCFNull
 kColorSyncDeviceModeDescription: localized mode description

9.1.4 DeviceProfiles as dictionary()

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Queris the device profiles.

Notes: The dictionaries contain the following keys:

kColorSyncDeviceClass	camera, display, printer, scanner
kColorSyncDeviceID	CFUUIDRef registered with ColorSync
kColorSyncDeviceDescription	localized device description
kColorSyncDeviceModeDescription	localized device mode description
kColorSyncDeviceProfileID	ProfileID registered with ColorSync
kColorSyncDeviceProfileURL	CFURLMBS registered with ColorSync
kColorSyncDeviceProfileIsFactory	Boolean
kColorSyncDeviceProfileIsDefault	Boolean
kColorSyncDeviceProfileIsCurrent	Boolean

9.1.5 kColorSyncCameraDeviceClass as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: A constant for a possible value for the device class.

9.1.6 kColorSyncCustomProfiles as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: Dictionary containing custom profile info.

9.1.7 kColorSyncDeviceClass as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.8 kColorSyncDeviceDefaultProfileID as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.9 kColorSyncDeviceDescription as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: String with a name in current locale.

9.1.10 kColorSyncDeviceDescriptions as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: Dictionary with localized names.

9.1.11 kColorSyncDeviceHostScope as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.12 kColorSyncDeviceID as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: Value is a CFUUIDMBS for this key.

9.1.13 kColorSyncDeviceModeDescription as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: String, e.g. Glossy, Best Quality.

9.1.14 `kColorSyncDeviceModeDescriptions` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: Dictionary with localized mode names.

9.1.15 `kColorSyncDeviceProfileID` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.16 `kColorSyncDeviceProfileIsCurrent` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.17 `kColorSyncDeviceProfileIsDefault` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.18 `kColorSyncDeviceProfileIsFactory` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.19 `kColorSyncDeviceProfilesNotification` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.20 kColorSyncDeviceProfileURL as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.21 kColorSyncDeviceRegisteredNotification as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.22 kColorSyncDeviceUnregisteredNotification as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.23 kColorSyncDeviceUserScope as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.24 kColorSyncDisplayDeviceClass as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: A constant for a possible value for the device class.

9.1.25 kColorSyncDisplayDeviceProfilesNotification as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.26 `kColorSyncFactoryProfiles` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

Notes: Dictionary containing factory profile info.

9.1.27 `kColorSyncPrinterDeviceClass` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: A constant for a possible value for the device class.

9.1.28 `kColorSyncProfileHostScope` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.29 `kColorSyncProfileUserScope` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the key constants for the info/options dictionaries.

9.1.30 `kColorSyncScannerDeviceClass` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: A constant for a possible value for the device class.

9.1.31 `RegisterDevice(deviceClass as string, deviceID as CFUUIDMBS, deviceInfo as dictionary)` as boolean

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Registeres a device.

Notes: deviceInfo: A dictionary containing information needed to register a device.

Required keys:

`kColorSyncDeviceDescriptions`: Dictionary with localized names of the device. Localization keys must be five character strings containing language code and region code in the `lc_RG` format and it must contain (at least) the "en_US" locale.

`kColorSyncFactoryProfiles`: Dictionary with factory profile info Dictionaries The keys are the profile IDs and the values are the profile info dictionaries.

Optional keys:

`kColorSyncDeviceHostScope`: host scope of the device; one of `kCFPreferences { Current,Any }` Host; if unspecified `kCFPreferencesCurrentHost` is assumed.

`kColorSyncDeviceUserScope`: user scope of the device; one of `kCFPreferences { Current,Any }` User; if unspecified `kCFPreferencesCurrentUser` is assumed.

factory profiles dictionary - value for the key `kColorSyncFactoryProfiles` in `deviceInfo`

Required keys and values:

Each profile is identified by a `ProfileID` (of `String` type) which used as the key. Value associated with the key is a profile info dictionary that describes an individual device profile.

`kColorSyncDeviceDefaultProfileID`: the associated value must be one of the `ProfileID` present in the dictionary. Presence of this key is not required if there is only one factory profile.

profile info Dictionary

Required keys:

`kColorSyncDeviceProfileURL`: `CFURLMBS` of the profile to be registered

`kColorSyncDeviceModeDescriptions`: Dictionary with localized device mode names for the profile. Localization keys must be five character strings containing language code and region code in the `lc_RG` format and it must contain (at least) the "en_US" locale. E.g. "en_US" "Glossy Paper with best quality"

Example of `deviceInfo` dictionary:

`kColorSyncDeviceDescriptions`:

en_US My Little Printer

de_DE Mein Kleiner Drucker

fr_FR Mon petit immprimeur

...

```

kColorSyncFactoryProfiles: "Profile 1"
kColorSyncDeviceProfileURL: CFURLMBS
kColorSyncDeviceModeDescriptions:
en_US Glossy Paper
de_DE Glanzpapier
fr_FR Papier glace
...

```

```

kColorSyncDeviceDefaultProfileID: "Profile 1"
kColorSyncDeviceUserScope: kCFPreferencesAnyUser
kColorSyncDeviceHostScope: kCFPreferencesCurrentHost

```

Notes:

1. Scope for factory profiles is exactly the same as the device scope.
2. Pass CFNullRef in lieu of the profile URL or no URL key/value pair at all if factory profile is not available. This will enable setting custom profile.
3. For the reasons of compatibility with legacy API, it is recommended that the profile keys are created as CFStrings from uint32 numbers as follows: key = encodings.UTF32.chr(value)

Returns true on success and false in case of failure

9.1.32 SetCustomProfiles(deviceClass as string, deviceID as CFUUIDMBS, profileInfo as dictionary) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Sets a custom profile:

Notes: profileInfo is a CFDictionary containing the information about custom profiles to be set in lieu of factory profiles.

Required keys:

ProfileIDs which must be the subset of the ProfileIDs that device was registered with or kColorSyncDeviceDefaultProfileID for setting custom default profile.

Required values:

CFURLMBS (folderitem) of the profile to be set as a custom profile.

Optional keys:

kColorSyncProfileHostScope: host scope of the profile; one of kCFPreferences { Current,Any } Host; if unspecified kCFPreferencesCurrentHost is assumed.

kColorSyncProfileUserScope: user scope of the profile; one of kCFPreferences { Current,Any } User; if unspecified kCFPreferencesCurrentUser is assumed.

Notes:

1. Profile scope for custom profiles cannot exceed scope of the factory profiles.
2. There is only one host scope and user scope per dictionary (i.e. per call)
3. Pass CFNullRef in lieu of the profile URL to unset the custom profile and reset the current profile to the factory profile.

Returns true on success and false in case of failure.

9.1.33 UnregisterDevice(deviceClass as string, deviceID as CFUUIDMBS) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Unregisters a device of given deviceClass and deviceID.

Notes: Returns true on success and false in case of failure.

9.2 class CSManagementModuleMBS

9.2.1 class CSManagementModuleMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The class for a Color Management Module module.

Notes: Color conversions are performed by a Color Management Module (CMM) which is a plugin to ColorSync. ColorSync contains Apple CMM, which is not replaceable, but third parties can install their own CMMs. ColorSync provides access to installed CMMs as well as those that can be part of the application bundle. CMM can be selected and specified as a preferred CMM per color transform created by the application. If the third party CMM fails to perform a task, Apple CMM will take it over.

Subclass of the CXObjectMBS class.

Blog Entries

- [MBS REALbasic Plugins, version 10.5pr5](#)

9.2.2 Methods

9.2.3 Bundle as CFBundleMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The bundle of the Color Management Module.

Notes: Nil for built-in Apple CMM.

9.2.4 CMMIdentifier as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The internal identifier for this Color Management Module.

Example:

```
dim a(-1) as CSManagementModuleMBS = CSManagementModuleMBS.InstalledCMMs
```

```
for each m as CSManagementModuleMBS in a
  MsgBox m.CMMIdentifier
next
```

9.2.5 Constructor(Bundle as CFBundleMBS)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a Color Management Module object from a given CF Bundle.

Example:

```
dim f as FolderItem = GetFolderItem("/Library/ColorSync/CMMs/AdobeCMM.cmm", FolderItem.PathType-Shell)
dim b as CFBundleMBS = CreateBundleMBS(F)
dim m as new CSManagementModuleMBS(b)

' MsgBox str(m.Handle) // must be non zero

MsgBox m.LocalizedName
MsgBox m.CMMIdentifier
```

9.2.6 InstalledCMMs as CSManagementModuleMBS()

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The list of installed Color Management Modules.

Example:

```
dim a(-1) as CSManagementModuleMBS = CSManagementModuleMBS.InstalledCMMs

for each m as CSManagementModuleMBS in a
dim path as string
dim bundle as CFBundleMBS = m.Bundle
if bundle<>nil then
dim ExecutableFileURL as CFURLMBS = bundle.URL
if ExecutableFileURL<>nil then
dim s as CFStringMBS = ExecutableFileURL.Str
if s<>nil then
path = s.str
end if
end if
end if

MsgBox m.CMMIdentifier+EndOfLine+EndOfLine+m.LocalizedName+EndOfLine+path
next
```

Notes: Returns an empty array on failure.

9.2.7 LocalizedName as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The localized name of this Color Management Module.

Example:

```
dim a(-1) as CSManagementModuleMBS = CSManagementModuleMBS.InstalledCMMs
```

```
for each m as CSManagementModuleMBS in a
  MsgBox m.LocalizedName
next
```

9.3 class CSMutableProfileMBS

9.3.1 class CSMutableProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The class for a mutable colorsync profile.

Notes: Subclass of the CProfileMBS class.

Blog Entries

- [MBS REALbasic Plugins, version 10.5pr5](#)

9.3.2 Methods

9.3.3 Constructor

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new empty mutable profile.

See also:

- 9.3.4 Constructor(profile as CProfileMBS)

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9.3.4 Constructor(profile as CProfileMBS)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a mutable copy of the given profile.

See also:

- 9.3.3 Constructor

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9.3.5 RemoveTag(signature as string)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Removes the tag with the signature.

9.3.6 SetHeader(data as string)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Sets the raw header data.

9.3.7 SetRawTag(signature as string, data as string)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Sets a tag with the raw data in a string.

9.4 class CProfileMBS

9.4.1 class CProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The class for a Colorsync profile.

Notes: Subclass of the CObjectMBS class.

Blog Entries

- [Features to be removed](#)
- [MBS REALbasic Plugins, version 10.5pr5](#)

9.4.2 Methods

9.4.3 Constructor(data as string, byref error as CErrorMBS)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a profile with the data in the given string.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic Gray Profile.icc",
FolderItem.PathTypeShell)
dim stream as BinaryStream = file.OpenAsBinaryFile(False) // BinaryStream.Open(f, false)
dim data as string = stream.read(stream.length)
dim e as CErrorMBS
dim p as new CProfileMBS(data, e)
```

```
MsgBox p.Description
```

Notes: On success the handle property is not zero.

See also:

- [9.4.4 Constructor\(DisplayID as Integer\)](#) 286
- [9.4.5 Constructor\(file as folderitem\)](#) 286
- [9.4.6 Constructor\(file as folderitem, byref error as CErrorMBS\)](#) 287
- [9.4.7 Constructor\(name as string\)](#) 287
- [9.4.8 Constructor\(profileSequence\(\) as dictionary, options as dictionary\)](#) 288

9.4.4 Constructor(DisplayID as Integer)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile with the given display.

Notes: displayID: system-wide unique display ID (defined by IOKit); pass 0 for main display.

On success the handle property is not zero.

See also:

- 9.4.3 Constructor(data as string, byref error as CFErrorMBS) 285
- 9.4.5 Constructor(file as folderitem) 286
- 9.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 287
- 9.4.7 Constructor(name as string) 287
- 9.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 288

9.4.5 Constructor(file as folderitem)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile based on the given file.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)
```

```
MsgBox p.Description
```

Notes: On success the handle property is not zero.

See also:

- 9.4.3 Constructor(data as string, byref error as CFErrorMBS) 285
- 9.4.4 Constructor(DisplayID as Integer) 286
- 9.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 287
- 9.4.7 Constructor(name as string) 287
- 9.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 288

9.4.6 Constructor(file as folderitem, byref error as CFErrorMBS)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile based on the given file.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim e as CFErrorMBS
dim p as new CSProfileMBS(file, e)
```

```
MsgBox p.Description
```

Notes: On success the handle property is not zero.

See also:

- 9.4.3 Constructor(data as string, byref error as CFErrorMBS) 285
- 9.4.4 Constructor(DisplayID as Integer) 286
- 9.4.5 Constructor(file as folderitem) 286
- 9.4.7 Constructor(name as string) 287
- 9.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 288

9.4.7 Constructor(name as string)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a profile with the given predefined name.

Example:

```
dim c as new CSProfileMBS(CSProfileMBS.kColorSyncGenericXYZProfile)
MsgBox c.Description
```

Notes: On success the handle property is not zero.

See also:

- 9.4.3 Constructor(data as string, byref error as CFErrorMBS) 285
- 9.4.4 Constructor(DisplayID as Integer) 286
- 9.4.5 Constructor(file as folderitem) 286
- 9.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 287
- 9.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 288

9.4.8 Constructor(profileSequence() as dictionary, options as dictionary)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a link profile.

Notes: profileSequence: An array of dictionaries, each one containing a profile object and the information on the usage of the profile in the transform.

Required keys:

kColorSyncProfile: CProfileMBS

kColorSyncRenderingIntent: String defining rendering intent

kColorSyncTransformTag: String defining which tags to use

Optional key:

kColorSyncBlackPointCompensation: Boolean to enable/disable BPC

options: dictionary with additional public global options (e.g. preferred CMM, quality, etc... It can also contain custom options that are CMM specific.

On success the handle property is not zero.

See also:

- 9.4.3 Constructor(data as string, byref error as CFErrorMBS) 285
- 9.4.4 Constructor(DisplayID as Integer) 286
- 9.4.5 Constructor(file as folderitem) 286
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9.4.9 ContainsTag(signature as string) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Whether the tag is contained in the profile.

9.4.10 CreateDeviceProfile(deviceClass as string, deviceID as CFUUIDMBS, profileID as Variant) as CProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a device profile.

Notes: deviceClass: ColorSync device class

deviceID: deviceID registered with ColorSync

profileID: profileID registered with ColorSync; pass kColorSyncDeviceDefaultProfileID to get the default profile.

See CSDeviceMBS for more info on deviceClass, deviceID and profileID

Returns nil on failure and Profile object on success.

9.4.11 CreateLink(profileSequence() as dictionary, options as dictionary) as CSProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a link profile.

Notes: profileSequence: An array of dictionaries, each one containing a profile object and the information on the usage of the profile in the transform.

Required keys:

kColorSyncProfile: CSProfileMBS

kColorSyncRenderingIntent: String defining rendering intent

kColorSyncTransformTag: String defining which tags to use

Optional key:

kColorSyncBlackPointCompensation: Boolean to enable/disable BPC

options: dictionary with additional public global options (e.g. preferred CMM, quality, etc... It can also contain custom options that are CMM specific.

Returns nil on failure and Profile object on success.

9.4.12 CreateWithData(data as string) as CSProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a profile with the data in the given string.

Notes: Returns nil on failure and Profile object on success.

See also:

- 9.4.13 `CreateWithData(data as string, byref error as CFErrorMBS) as CSProfileMBS` 290

9.4.13 `CreateWithData(data as string, byref error as CFErrorMBS) as CSProfileMBS`

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a profile with the data in the given string.

Notes: Returns nil on failure and Profile object on success.

See also:

- 9.4.12 `CreateWithData(data as string) as CSProfileMBS` 289

9.4.14 `CreateWithDisplayID(DisplayID as Integer) as CSProfileMBS`

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile with the given display.

Notes: displayID: system-wide unique display ID (defined by IOKit); pass 0 for main display.

Returns nil on failure and Profile object on success.

9.4.15 `CreateWithFile(file as folderitem) as CSProfileMBS`

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile based on the given file.

Notes: Returns nil on failure and Profile object on success.

See also:

- 9.4.16 `CreateWithFile(file as folderitem, byref error as CFErrorMBS) as CSProfileMBS` 290

9.4.16 `CreateWithFile(file as folderitem, byref error as CFErrorMBS) as CSProfileMBS`

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile based on the given file.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
```

```
dim e as CFErrorMBS
dim p as new CSProfileMBS(file, e)
```

MsgBox p.Description

Notes: Returns nil on failure and Profile object on success.
See also:

- 9.4.15 CreateWithFile(file as folderitem) as CSProfileMBS

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9.4.17 CreateWithName(name as string) as CSProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a profile with the given name.

Example:

```
dim s as string = CSProfileMBS.kColorSyncGenericXYZProfile
dim c as CSProfileMBS = CSProfileMBS.CreateWithName(s)
MsgBox c.Description
```

Notes: Returns nil on failure and Profile object on success.

9.4.18 CreateWithURL(url as string) as CSProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile based on the file at the given URL.

Notes: Returns nil on failure and Profile object on success.

See also:

- 9.4.19 CreateWithURL(url as string, byref error as CFErrorMBS) as CSProfileMBS

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9.4.19 CreateWithURL(url as string, byref error as CFErrorMBS) as CSProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new profile based on the file at the given URL.

Notes: Returns nil on failure and Profile object on success.

See also:

- 9.4.18 CreateWithURL(url as string) as CProfileMBS

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9.4.20 Data as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns a string with the raw data of the profile.

9.4.21 Edit as CMutableProfileMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates an editable copy of the profile.

Notes: Returns nil on any error.

9.4.22 EstimateGamma as Double

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Calculates the estimated gamma for this profile.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic Gray Profile.icc",
FolderItem.PathTypeShell)
dim p as new CProfileMBS(file)
```

```
MsgBox str(p.EstimateGamma) // 1.8
```

Notes: Returns non-zero value if success or 0.0 in case of error.

See also:

- 9.4.23 EstimateGamma(byref error as CFErrorMBS) as Double

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9.4.23 EstimateGamma(byref error as CFErrorMBS) as Double

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Calculates the estimated gamma for this profile.

Notes: Returns non-zero value if success or 0.0 in case of error.

See also:

- 9.4.22 EstimateGamma as Double

292

9.4.24 EstimateGammaWithDisplayID(displayID as Integer) as Double

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Calculates the estimated gamma value for the given display.

Notes: displayID: system-wide unique display ID.

See also:

- 9.4.25 EstimateGammaWithDisplayID(displayID as Integer, byref error as CFErrorMBS) as Double
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9.4.25 EstimateGammaWithDisplayID(displayID as Integer, byref error as CFErrorMBS) as Double

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Calculates the estimated gamma value for the given display.

Notes: displayID: system-wide unique display ID.

See also:

- 9.4.24 EstimateGammaWithDisplayID(displayID as Integer) as Double
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9.4.26 File as folderitem

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The file reference for this profile.

See also:

- 9.4.27 File(byref error as CFErrorMBS) as folderitem
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9.4.27 File(byref error as CFErrorMBS) as folderitem

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The file reference for this profile.

See also:

- 9.4.26 File as folderitem
293

9.4.28 Header as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns a string with the raw header content.

9.4.29 InstalledProfiles as dictionary()

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Queries the list of installed profiles.

Example:

```
dim a(-1) as Dictionary = CSProfileMBS.InstalledProfiles
dim lines(-1) as string

for each d as Dictionary in a
lines.Append d.Value(CSProfileMBS.kColorSyncProfileDescription)
next

MsgBox Join(lines,EndOfLine)
```

Notes: Returns an empty array on any error.

Note: When called for the first time this function will return only system profiles because profile iteration is a slow process requiring multiple access to file system.

e.g. you may call it in app.open, so later when you call it again, the list is gathered.

9.4.30 kColorSyncAdobeRGB1998Profile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.31 kColorSyncGenericCMYKProfile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.32 kColorSyncGenericGrayGamma22Profile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.33 kColorSyncGenericGrayProfile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.34 kColorSyncGenericLabProfile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.35 kColorSyncGenericRGBProfile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.36 kColorSyncGenericXYZProfile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the predefined profile names.

9.4.37 kColorSyncProfileClass as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.38 kColorSyncProfileColorSpace as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.39 kColorSyncProfileDescription as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.40 kColorSyncProfileHeader as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.41 kColorSyncProfileMD5Digest as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.42 kColorSyncProfilePCS as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.43 kColorSyncProfileURL as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.44 kColorSyncSRGBProfile as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the tag signature constants.

Notes: Can be used with the dictionary returned by the InstalledProfiles method.

9.4.45 MD5 as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: MD5 digest for the profile calculated as defined by ICC specification.

Notes: Returns a 16 byte string with the raw bytes of the signature.

Returns an empty string on any error.

9.4.46 RawTag(signature as string) as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the raw tag value as string.

9.4.47 TagSignatures as string()

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns an array of the tag signatures.

9.4.48 URL as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The URL reference for this profile.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)
```

MsgBox p.URL

See also:

- 9.4.49 URL(byref error as CFErrorMBS) as string

9.4.49 URL(byref error as CFErrorMBS) as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The URL reference for this profile.

See also:

- 9.4.48 URL as string

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9.4.50 Verify(byref errors as CFErrorMBS, byref warnings as CFErrorMBS) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Verifies the profile.

Notes: errors: returns error strings in case problems are found which would prevent use of the profile.

warnings: returns warning strings indicating problems due to lack of conformance with the ICC specification, but not preventing use of the profile.

Returns true if profile can be used or false otherwise.

9.4.51 Properties

9.4.52 Description as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the containing profile description localized to current locale.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)
```

```
MsgBox p.Description
```

Notes: (Read only property)

9.4.53 MD5String as String

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: MD5 digest for the profile calculated as defined by ICC specification.

Example:

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",  
FolderItem.PathTypeShell)  
dim p as new CSProfileMBS(file)
```

```
MsgBox p.MD5String
```

Notes: Returns a 32 byte human readable hexstring with the bytes of the signature.

Returns an empty string on any error.

(Read only property)

9.5 class CSTransformMBS

9.5.1 class CSTransformMBS

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: The class for a ColorSync transformation.

Notes: This class uses newer APIs than those in the older ColorSyncWorldMBS class.

Subclass of the CFOBJECTMBS class.

Blog Entries

- [MBS Xojo Plugins, version 19.3pr1](#)
- [MBS REALbasic Plugins, version 10.5pr5](#)

9.5.2 Methods

9.5.3 Constructor(profileSequence() as dictionary, options as dictionary)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a new transformation.

Notes: profileSequence: Array of dictionaries, each one containing a profile object and the information on the usage of the profile in the transform.

Required keys:

kColorSyncProfile: CProfileMBS

kColorSyncRenderingIntent: String defining rendering intent

kColorSyncTransformTag: String defining which tags to use

Optional key:

kColorSyncBlackPointCompensation: Boolean to enable/disable BPC

options: dictionary with additional public global options (e.g. preferred CMM, quality, etc... It can also contain custom options that are CMM specific.

On success the handle property is not zero.

9.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the convert methods to transform data.

Notes: dest: Destination picture.

source: Source picture.

src: A memroyblock to the data to be converted.

srcDepth: Describes the bit depth and type of the source color components

srcFormat: Describes the format and byte packing of the source pixels

srcBytesPerRow: Number of bytes in the row of data

returns true if conversion was successful or false otherwise

See also:

- 9.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean 301
- 9.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean 302
- 9.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 302

9.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the convert methods to transform data.

Notes: dest: Destination picture.

source: Source picture.

Should only be used with RGB for source/dest profile.

returns true if conversion was successful or false otherwise

See also:

- 9.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 301
- 9.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean 302

- 9.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 302

9.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the convert methods to transform data.

Notes: dest: Destination picture.

dst: A memroyblock to the destination where the results will be written.

dstDepth: Describes the bit depth and type of the destination color components

dstFormat: Describes the format and byte packing of the destination pixels

dstBytesPerRow: number of bytes in the row of data

source: Source picture.

returns true if conversion was successful or false otherwise

See also:

- 9.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 301
- 9.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean 301
- 9.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 302

9.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the convert methods to transform data.

Notes: width: Width of the image in pixels. (or taken from picture object)

height: Height of the image in pixels. (or taken from picture object)

dst: A memroyblock to the destination where the results will be written.

dstDepth: Describes the bit depth and type of the destination color components

dstFormat: Describes the format and byte packing of the destination pixels

dstBytesPerRow: number of bytes in the row of data

src: A memroyblock to the data to be converted.

srcDepth: Describes the bit depth and type of the source color components

srcFormat: Describes the format and byte packing of the source pixels

srcBytesPerRow: Number of bytes in the row of data

returns true if conversion was successful or false otherwise

See also:

- 9.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 301
- 9.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean 301
- 9.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean 302

9.5.8 GetProperty(key as Variant) as Variant

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Queries a property.

Notes: Returns nil if the value is nil or we had an error.

9.5.9 kColorSyncBestQuality as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncConvertQuality key.

Notes: do not coalesce profile transforms (default)

9.5.10 kColorSyncBlackPointCompensation as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys used for profile info and options.

9.5.11 kColorSyncConversion1DLut as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.12 `kColorSyncConversion3DLut` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.13 `kColorSyncConversionBPC` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.14 `kColorSyncConversionChannelID` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.15 `kColorSyncConversionGridPoints` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.16 `kColorSyncConversionInpChan` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.17 `kColorSyncConversionMatrix` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.18 kColorSyncConversionOutChan as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.19 kColorSyncConversionParamCurve0 as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.20 kColorSyncConversionParamCurve1 as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.21 kColorSyncConversionParamCurve2 as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.22 kColorSyncConversionParamCurve3 as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.23 `kColorSyncConversionParamCurve4` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.24 `kColorSyncConvertQuality` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the transform options keys.

9.5.25 `kColorSyncDraftQuality` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the `kColorSyncConvertQuality` key.

Notes: coalesce all transforms, do not interpolate

9.5.26 `kColorSyncNormalQuality` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the `kColorSyncConvertQuality` key.

Notes: coalesce all transforms

9.5.27 `kColorSyncPreferredCMM` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the transform options keys.

Notes: Value is a `CSManagementModuleMBS` object.

9.5.28 `kColorSyncProfile` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys used for profile info and options.

9.5.29 kColorSyncRenderingIntent as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys used for profile info and options.

9.5.30 kColorSyncRenderingIntentAbsolute as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncRenderingIntent key.

9.5.31 kColorSyncRenderingIntentPerceptual as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncRenderingIntent key.

9.5.32 kColorSyncRenderingIntentRelative as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncRenderingIntent key.

9.5.33 kColorSyncRenderingIntentSaturation as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncRenderingIntent key.

9.5.34 kColorSyncRenderingIntentUseProfileHeader as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncRenderingIntent key.

9.5.35 `kColorSyncTransformCreator` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the dictionary used with the `kColorSyncTranformInfo` keys.

Notes: name of the CMM that created the transform

9.5.36 `kColorSyncTransformDeviceToDevice` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the `kColorSyncTransformTag` key.

9.5.37 `kColorSyncTransformDeviceToPCS` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the `kColorSyncTransformTag` key.

9.5.38 `kColorSyncTransformDstSpace` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the dictionary used with the `kColorSyncTranformInfo` keys.

9.5.39 `kColorSyncTransformFullConversionData` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.40 `kColorSyncTransformGamutCheck` as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the `kColorSyncTransformTag` key.

9.5.41 kColorSyncTransformParametricConversionData as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.42 kColorSyncTransformPCSToDevice as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncTransformTag key.

9.5.43 kColorSyncTransformPCSToPCS as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the kColorSyncTransformTag key.

9.5.44 kColorSyncTransformSimplifiedConversionData as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the option keys.

Notes: For more information lookup details in Apples headers/documentation.

9.5.45 kColorSyncTransformSrcSpace as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the value constants for use with the dictionary used with the kColorSyncTranformInfo keys.

9.5.46 kColorSyncTransformTag as string

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys used for profile info and options.

9.5.47 PrintClasses

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Writes the declarations of the plugin classes to the console.

Notes: Call in console applications.

9.5.48 SetProperty(key as Variant, value as Variant)

Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

Function: Sets a property.

9.5.49 Constants

Constants

Constant	Value	Description
kColorSync16BitFloat	4	One of the possible data depth values constants. 16 bit floats.
kColorSync16BitInteger	3	One of the possible data depth values constants. 16 bit integers (short)
kColorSync1BitGamut	1	One of the possible data depth values constants. 1 bit graphics.
kColorSync32BitFloat	7	One of the possible data depth values constants. 32 bit float (single in Xojo)
kColorSync32BitInteger	5	One of the possible data depth values constants. 32 bit integer
kColorSync32BitNamedColorIndex	6	One of the possible data depth values constants. 32 bit integers with index of named color.
kColorSync8BitInteger	2	One of the possible data depth values constants. 8 bit graphics (this is used in Xojo Picture objects)
kColorSyncAlphaFirst	4	One of the alpha constants. For example, non-premultiplied ARGB
kColorSyncAlphaInfoMask	&h1F	One of the alpha constants. The bitmask for bitwise.BitAnd to extract the alpha value.
kColorSyncAlphaLast	3	One of the alpha constants. For example, non-premultiplied RGBA
kColorSyncAlphaNone	0	One of the alpha constants. For example, RGB.
kColorSyncAlphaNoneSkipFirst	6	One of the alpha constants. For example, XRGB.
kColorSyncAlphaNoneSkipLast	5	One of the alpha constants. For example, RBGX.
kColorSyncAlphaPremultipliedFirst	2	One of the alpha constants. For example, premultiplied ARGB
kColorSyncAlphaPremultipliedLast	1	One of the alpha constants. For example, premultiplied RGBA
kColorSyncByteOrder16Big	12288	One of the byte order constants. 16 bit, big endian.
kColorSyncByteOrder16Little	4096	One of the byte order constants. 16 bit, little endian.
kColorSyncByteOrder32Big	16384	One of the byte order constants. 32 bit, big endian.
kColorSyncByteOrder32Little	8192	One of the byte order constants. 32 bit, little endian.
kColorSyncByteOrderDefault	0	One of the byte order constants.
kColorSyncByteOrderMask	&h7000	One of the byte order constants.

Chapter 10

CoreFoundation

10.1 Globals

10.1.1 NewCFOBJECTMBSFromXML(XMLdata as MemoryBlock) as CFOBJECTMBS

Plugin Version: 19.0, Platform: macOS, Targets: All.

Function: Parses the XML data and returns a CFOBJECT.

Notes: Note that the CFOBJECT returned is in most times a CFDictionary or a CFArray.

This function takes text and binary plist file content.

See also:

- 10.1.2 NewCFOBJECTMBSFromXML(XMLdata as String) as CFOBJECTMBS 313

10.1.2 NewCFOBJECTMBSFromXML(XMLdata as String) as CFOBJECTMBS

Plugin Version: 19.0, Platform: macOS, Targets: All.

Function: Parses the XML data and returns a CFOBJECT.

Notes: Note that the CFOBJECT returned is in most times a CFDictionary or a CFArray.

This function takes text and binary plist file content.

See also:

- 10.1.1 NewCFOBJECTMBSFromXML(XMLdata as MemoryBlock) as CFOBJECTMBS 313

10.1.3 NewCFStringMBS2(s as string) as CFStringMBS

Plugin Version: 8.5, Platform: macOS, Targets: All.

Function: Returns a CFStringMBS object created using the given string.

Example:

```
dim s as CFStringMBS

s=NewCFStringMBS2("")
// s is not nil here
MsgBox str(s.Handle)
```

Notes: The cfstring may be unicode.
See also NewCFStringMBS.

10.1.4 kCFCharacterSetMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFCharacterSetMBS object.

10.1.5 NewCFOBJECTMBSFromXMLMT(data as string) as CFOBJECTMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Parses the XML data and returns a CFOBJECT.

Notes: Same as NewCFOBJECTMBSFromXML, but with additional multithreading.

Note that the CFOBJECT returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 10.1.6 NewCFOBJECTMBSFromXMLMT(file as folderitem) as CFOBJECTMBS 314
- 10.1.7 NewCFOBJECTMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CFOBJECTMBS 315

10.1.6 NewCFOBJECTMBSFromXMLMT(file as folderitem) as CFOBJECTMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Parses the XML data and returns a CObject.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xml")
dim o as CObjectMBS = NewCObjectMBSFromXMLMT(f)

if o = nil then
  MsgBox "Error"
else
  MsgBox "OK"
end if
```

Notes: Same as NewCObjectMBSFromXML, but with additional multithreading.

Note that the CObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 10.1.5 NewCObjectMBSFromXMLMT(data as string) as CObjectMBS 314
- 10.1.7 NewCObjectMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CObjectMBS 315

10.1.7 NewCObjectMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CObjectMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Parses the XML data and returns a CObject.

Notes: Note that the CObject returned is in most times a CFDictionary or a CFArray.

This function takes text and binary plist file content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 10.1.5 NewCObjectMBSFromXMLMT(data as string) as CObjectMBS 314
- 10.1.6 NewCObjectMBSFromXMLMT(file as folderitem) as CObjectMBS 314

10.1.8 CFShowCFStringMBS(cfstring as CFStringMBS)

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Prints the content of the given CFString to the console.

Blog Entries

- [MBS Real Studio Plugins, version 12.4pr3](#)

10.1.9 CFShowMBS(cfoobject as CFObjectMBS)

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Prints the content of the given CFObject to the console.

Notes: Very useful for e.g. CFDictionary.

Blog Entries

- [MBS Real Studio Plugins, version 12.4pr3](#)

10.1.10 CreateBundleMBS(file as folderitem) as CFBundleMBS

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Creates a CFBundle object for the bundle folder on the given position.

Example:

// Find and show the main executable file of a bundled application

```
dim f as FolderItem
```

```
f=SpecialFolder.Applications.Child("Mail.app")
MsgBox f.NativePath // shows app bundle path
```

```
dim b as CFBundleMBS
dim u as CFURLMBS
```

```
b=CreateBundleMBS(f)
if b<>nil then
u=b.ExecutableFile
if u<>nil then
MsgBox f.NativePath // shows app executable path
end if
end if
```

Notes: Returns nil on any error.

See also:

- 10.1.11 CreateBundleMBS(url as CFURLMBS) as CFBundleMBS

10.1.11 CreateBundleMBS(url as CFURLMBS) as CFBundleMBS

Platform: macOS, Targets: All.

Function: Creates a CFBundle object for the bundle folder on the given position.

Example:

```
// Find and show the main executable file of a bundled application
```

```
dim f as FolderItem
```

```
f=SpecialFolder.Applications.Child("Mail.app")
```

```
MsgBox f.NativePath // shows app bundle path
```

```
dim b as CFBundleMBS
```

```
dim u as CFURLMBS
```

```
u=NewCFURLMBSFile(f)
```

```
if u<>Nil then
```

```
  b=CreateBundleMBS(u)
```

```
  if b<>nil then
```

```
    u=b.ExecutableFile
```

```
    if u<>nil then
```

```
      MsgBox f.NativePath // shows app executable path
```

```
    end if
```

```
  end if
```

```
end if
```

Notes: Returns nil on any error.

See also:

- 10.1.10 CreateBundleMBS(file as folderitem) as CFBundleMBS

10.1.12 CreateBundlesFromDirectoryMBS(url as CFURLMBS, type as CFStringMBS) as CFArrayMBS

Platform: macOS, Targets: All.

Function: Returns a list of all bundles in a folder.

Notes: Returns nil on any error.

With the Type parameter you can limit the bundles to a certain type.

The abstract type of the bundles you wish to locate and create. The type is expressed as a filename exten-

sion, such as bundle. Pass NULL to create CFBundle objects for bundles of any type.

10.1.13 CreateCFTimeZoneMBS(name as CFStringMBS, data as CFBinaryDataMBS) as CFTimeZoneMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Creates a new timezone object with the given name and data.

Notes: Returns nil on any error.

10.1.14 CreateCFTimeZoneMBSwithName(name as CFStringMBS, TryAbbrev as boolean) as CFTimeZoneMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Creates a new timezone object with the object from the system which matches the given name.

Notes: If TryAbbrev is true the system also checks if the name matches the abbreviated name of the timezone object.

Returns nil on any error.

10.1.15 CreateCFTimeZoneMBSwithTimeIntervalFromGMT(time as CFTimeIntervalMBS) as CFTimeZoneMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Creates a new timezone object with the given time interval.

Notes: Returns nil on any error.

10.1.16 CreateStringByAddingPercentEscapesMBS(original as CFStringMBS, charactersToLeaveEscaped as CFStringMBS, legalURLCharactersToBeEscaped as CFStringMBS, encoding as Integer) as CFStringMBS

Platform: macOS, Targets: All.

Function: Adds percent escapes inside a string.

Notes: If charactersToLeaveEscaped=nil then no string is changed. If charactersToLeaveEscaped contains an empty string ("") all escapes are changed and if charactersToLeaveEscaped contains a string<>"" then this characters are not escaped.

10.1.17 CreateStringByReplacingPercentEscapesMBS(original as CFStringMBS,charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

Platform: macOS, Targets: All.

Function: Replaces percent escapes inside a string.

Notes: If charactersToLeaveEscaped=nil then no string is changed. If charactersToLeaveEscaped contains an empty string ("") all escapes are changed and if charactersToLeaveEscaped contains a string<>"" then this characters are not escaped.

10.1.18 CurrentCFAbsoluteTimeMBS as CFAbsoluteTimeMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The current time as an absolute time object.

Example:

```
// get current timezone
dim c as CFTimeZoneMBS = SystemCFTimeZoneMBS

// and current time
dim time as CFAbsoluteTimeMBS = CurrentCFAbsoluteTimeMBS

// Do we have daylight saving time?
MsgBox str(c.IsDaylightSavingTime(time))
```

Notes: Returns nil on any error.

10.1.19 GetAllBundlesMBS as CFArrayMBS

Platform: macOS, Targets: All.

Function: Returns a list of all known bundles on the system.

Notes: Returns nil on any error.

10.1.20 GetBundleWithIdentifierMBS(id as CFStringMBS) as CFBundleMBS

Platform: macOS, Targets: All.

Function: Creates a CFBundle object for the bundle with the given ID.

Notes: Returns nil on any error.

Returns only a bundle if that bundle has been loaded before.

For a bundle to be located using its identifier, the bundle object must have already been created. The principal intended purpose for locating bundles by identifier is so that code (in frameworks, plugins, etc.) can find its own bundle. If a bundle is created, then the bundle deleted from the filesystem and this function invoked afterwards, it will still return the original bundle.

10.1.21 `GetDefaultCFTimeZoneMBS` as `CFTimeZoneMBS`

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The default time zone.

Example:

```
msgBox str(GetDefaultCFTimeZoneMBS.SecondsFromGMT(nil).Value)
```

Notes: Returns nil on any error.

10.1.22 `kCFArrayMBSTypeID` as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a `CFArrayMBS` object.

10.1.23 `kCFBagMBSTypeID` as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a `CFBagMBS` object.

10.1.24 `kCFBinaryDataMBSTypeID` as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a `CFBinary` object.

10.1.25 kCFBooleanMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFBooleanMBS object.

10.1.26 kCFBundleMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFBundle object.

Notes: CFBundle objects may be supported in a future version of this plugin. Request if you need more than the app.bundle functions offer you.

10.1.27 kCFDateMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFDateMBS object.

10.1.28 kCFDictionaryMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFDictionaryMBS object.

10.1.29 kCFNumberMBSNaN as CFNumberMBS

Platform: macOS, Targets: All.

Function: Returns a CFNumberMBS object for NaN (not a number).

10.1.30 kCFNumberMBSNegativeInfinity as CFNumberMBS

Platform: macOS, Targets: All.

Function: Returns a CFNumberMBS object for negative infinity.

10.1.31 kCFNumberMBSPositiveInfinity as CFNumberMBS

Platform: macOS, Targets: All.

Function: Returns a CFNumberMBS object for positive infinity.

10.1.32 kCFNumberMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFNumberMBS object.

10.1.33 kCFSetMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFSetMBS object.

10.1.34 kCFStringMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFStringMBS object.

10.1.35 kCFTimeZoneMBSTypeID as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFTimeZone object.

10.1.36 kCFURLMBSTypeID as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFURLMBS object.

10.1.37 KnownTimeZoneNamesAsCFArrayMBS as CFArrayMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: An array of all known time zone names.

Notes: Returns nil on any error.

10.1.38 MacShowAboutBoxMBS(options as CFDictionaryMBS) as Integer

Plugin Version: 9.3, Platform: macOS, Targets: All.

Function: Displays an HI-conformant about box.

Example:

```
dim kHIAboutBoxNameKey as CFStringMBS = NewCFStringMBS("HIAboutBoxName")
dim kHIAboutBoxVersionKey as CFStringMBS = NewCFStringMBS("HIAboutBoxVersion")
dim kHIAboutBoxCopyrightKey as CFStringMBS = NewCFStringMBS("HIAboutBoxCopyright")
dim kHIAboutBoxDescriptionKey as CFStringMBS = NewCFStringMBS("HIAboutBoxDescription")
dim kHIAboutBoxStringFileKey as CFStringMBS = NewCFStringMBS("HIAboutBoxStringFile")
```

```
dim d as CFMutableDictionaryMBS
```

```
d=NewCFMutableDictionaryMBS
```

```
// name, version and copyright are optional:
```

```
d.add(kHIAboutBoxNameKey, NewCFStringMBS("MyApp"))
```

```
d.add(kHIAboutBoxVersionKey, NewCFStringMBS("1.0"))
```

```
d.add(kHIAboutBoxCopyrightKey, NewCFStringMBS("©2009 by Christian Schmitz"))
```

```
// description is needed
```

```
d.add(kHIAboutBoxDescriptionKey, NewCFStringMBS("The best application I ever made!"))
```

```
// optional
```

```
'd.add(kHIAboutBoxStringFileKey, NewCFStringMBS("somefile"))
```

```
MsgBox Str(MacShowAboutBoxMBS(d))
```

Notes: This about box is a generic about box that automatically can display your application name, version string, and copyright string. It peeks into either the Info.plist (for the CFBundleName, CFBundleVersion, and CFBundleGetInfoString keys) or your bundle resource (not recommended) to get the information by default. You can customize what it displays by passing in various options in the input dictionary. Note that currently the description string can only be specified in the options dictionary; this function does not check your Info.plist for a descriptions string.

There are three basic ways to call this function. First, you can pass nil for inOptions. As mentioned, default

information will be displayed. Second, you can pass the actual values for the strings displayed by passing the strings in the `inOptions` dictionary using the keys provided, such as `kHIAboutBoxNameKey`. If a replacement string is not passed, the default behavior kicks in. For example, you could pass some variant of your application name in the dictionary, but not pass a replacement version or copyright strings. The Toolbox would display your replacement string, and fall back to looking in the `Info.plist` for the other strings. The third way to call this is to pass the name of a string file in the dictionary with the key `kHIAboutBoxStringFileKey`. We will automatically use that file to find the strings for the about box. The keys in the string file should be the same value as the keys you would use to pass into the `inOptions` dictionary. Again, if a string is not found in that file, we would fall back to looking for a string in the dictionary, and then finally the `Info.plist`. Certainly this is not the be-all-end-all of about boxes, but it does provide a simple no-work about box for your application. The standard Toolbox application handler now responds to the `kHICommandAbout` command ID by calling `HIAboutBox` for you. This means that any Carbon Event-based application will get this behavior for free right out of the box. If you wish for the window to respond to `cmd-W` in the menu bar, you should make sure that menu item has the `kHICommandClose` commandID.

Options: A dictionary of replacement strings, or the name of a string file to retrieve the strings from, or `nil`. See the discussion for how this is used.

Returns a Mac OS error code or -1 if function is not available.

Not supported on 64 bit targets.

Blog Entries

- [MBS REALbasic plug-ins version 9.3](#)

Xojo Developer Magazine

- [7.4, page 8: News](#)

10.1.39 NewCFAbsoluteTimeMBS(time as Double) as CFAbsoluteTimeMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns a new absolute time object with the given value.

Notes: Returns `nil` on any error.

10.1.40 NewCFBinaryDataMBSMem(mem as memoryblock,len as Integer) as CFBinaryDataMBS

Platform: macOS, Targets: All.

Function: Returns a `CFBinary` object for the given `memoryblock`.

10.1.41 NewCFBinaryDataMBSStr(s as string) as CFBinaryDataMBS

Platform: macOS, Targets: All.

Function: Returns a CFBinary object for the given string.

Example:

```
dim t as TextOutputStream
dim f as FolderItem
dim o as CFObjectMBS
dim s as string
dim i as TextInputStream

f=SpecialFolder.Desktop.Child("test")
o=NewCFStringMBS("Hello")

// write

s=o.XML.str
s=ConvertEncoding(s,Encodings.UTF8)

t=f.CreateTextFile
t.Write s
t.Close

// clear

o=nil

// now read back

i=f.OpenAsTextFile
s=i.ReadAll(Encodings.UTF8)
i.Close

o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

MsgBox CFStringMBS(o).str
```

10.1.42 NewCFBooleanMBS(value as boolean) as CFBooleanMBS

Platform: macOS, Targets: All.

Function: Returns a CFBooleanMBS object created using the given boolean.

10.1.43 NewCFDateMBS as CFDateMBS

Platform: macOS, Targets: All.

Function: Returns a new empty CFDateMBS.

10.1.44 NewCFMutableArrayMBS as CFMutableArrayMBS

Platform: macOS, Targets: All.

Function: Creates a new empty mutable array.

Notes: The array's maximum capacity is unlimited (or rather, only limited by address space and available memory constraints).

10.1.45 NewCFMutableBagMBS as CFMutableBagMBS

Platform: macOS, Targets: All.

Function: Returns a new empty CFMutableBagMBS.

10.1.46 NewCFMutableBinaryDataMBSMem(len as Integer) as CFMutableBinaryDataMBS

Platform: macOS, Targets: All.

Function: Returns a CFMutableBinary object with the given size in bytes.

10.1.47 NewCFMutableDictionaryMBS as CFMutableDictionaryMBS

Platform: macOS, Targets: All.

Function: Returns a new empty CFMutableDictionaryMBS.

Example:

```
dim d as CFMutableDictionaryMBS
```

```
d=NewCFMutableDictionaryMBS  
d.Add NewCFStringMBS("Key"),NewCFStringMBS("Value")  
MsgBox d.XML.str
```

Blog Entries

- [MBS Plugins 11.1 Release notes](#)
- [MBS Real Studio Plugins, version 11.1pr10](#)

10.1.48 NewCFMutableSetMBS as CFMutableSetMBS

Platform: macOS, Targets: All.

Function: Returns a new empty CFMutableSetMBS.

10.1.49 NewCFNumberMBSDouble(doubleValue as Double) as CFNumberMBS

Platform: macOS, Targets: All.

Function: Returns a CFNumberMBS object for the given double value.

10.1.50 NewCFNumberMBSInteger(integerValue as Integer) as CFNumberMBS

Platform: macOS, Targets: All.

Function: Returns a CFNumberMBS object for the given integer value.

10.1.51 NewCFNumberMBSSingle(singleValue as single) as CFNumberMBS

Platform: macOS, Targets: All.

Function: Returns a CFNumberMBS object for the given single value.

10.1.52 NewCFObjectMBS(handle as Integer) as CFObjectMBS

Platform: macOS, Targets: All.

Function: Returns a CFObjectMBS object for the given handle.

Example:

```
dim d as CFMutableDictionaryMBS
dim s as CFStringMBS
dim o as CFObjectMBS
dim t as CFStringMBS
```

```

d=NewCFMutableDictionaryMBS
s=NewCFStringMBS("Hello")

d.Add s,s

o=d.Value(s) // uses NewCFOBJECTMBS internally

t=cfstringMBS(o) // Now you can cast here in v5.2!

MsgBox t.str

```

Notes: Handle is just a CFTypeRef.

If release is true, the destructor of the CFOBJECTMBS will release the handle later.

In Version 5.2 this function can return objects which may be casted to CFURL, CFDictionary, CFString, CFNumber, CFCharacterSet, CFBag, CFArray, CFBoolean, CFBinaryData or CFSet.

10.1.53 NewCFOBJECTMBSFromXML(XMLdata as CFBinaryDataMBS) as CFOBJECTMBS

Platform: macOS, Targets: All.

Function: Parses the XML data and returns a CFOBJECT.

Example:

```

dim f as FolderItem
dim t as TextInputStream
dim s as String
dim o as CFOBJECTMBS
dim d as CFDictionaryMBS

// get file name
f=GetFolderItem("CF XML Test.txt")
// open file
t=f.OpenAsTextFile
// Read String
s=t.ReadAll

// Create back
o=NewCFOBJECTMBSFromXML(NewCFBinaryDataMBSStr(s))

// now check if the dictionary we saved is there:
if o<>nil then
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

```

```
MsgBox CFStringMBS(d.Value(NewCFStringMBS("Key"))).str  
end if  
end if
```

Notes: Note that the CFObject returned is in most times a CFDictionary or a CFArray. This function takes text and binary plist file content.

10.1.54 NewCFStringMBS(s as string) as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns a CFStringMBS object created using the given string.

Notes: Returns nil if s is empty.

The cfstring may be unicode.

See also NewCFStringMBS2 if you want to get an empty CFString object for an empty string.

10.1.55 NewCFTimeIntervalMBS(time as Double) as CFTimeIntervalMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns a new time interval object with the given value.

Notes: Returns nil on any error.

10.1.56 NewCFURLMBS CFStringMBS(cfstr as CFStringMBS, baseurl as CFURLMBS) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from the CFStringMBS.

10.1.57 NewCFURLMBSFile(f as folderitem) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from a file.

10.1.58 NewCFURLMBSHFSPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from the CFStringMBS which is interpreted as a HFS path.

10.1.59 NewCFURLMBSMem(mem as memoryblock,len as Integer,encoding as Integer,baseurl as CFURLMBS) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from the data inside the memoryblock.

Notes: Len is the len of the data inside the memoryblock.

Encoding the ID of the text encoding.

BaseURL is the base url. If baseurl=nil then the current application directory is used.

10.1.60 NewCFURLMBSPosixPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from the CFStringMBS which is interpreted as a Posix path.

10.1.61 NewCFURLMBSStr(str as string, baseurl as CFURLMBS) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from the string.

Example:

```
dim s as string
dim f as FolderItem
dim cu as CFURLMBS
```

```
s="file://localhost/Users/cs/Music/iTunes/iTunes%20Music"
```

```
cu=NewCFURLMBSStr(s,nil) // true=isdirectory
f=cu.file
```

```
MsgBox f.NativePath
```

Notes: BaseURL is the base url. If baseurl=nil then the current application directory is used.

10.1.62 NewCFURLMBSWindowsPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS

Platform: macOS, Targets: All.

Function: Creates a new CFURLMBS from the CFStringMBS which is interpreted as a Windows path.

10.1.63 SetDefaultCFTimeZoneMBS(timezone as CFTimeZoneMBS)

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The default time zone.

Example:

```
msgBox str(GetDefaultCFTimeZoneMBS.SecondsFromGMT(nil).Value)
```

Notes: Returns nil on any error.

10.1.64 SystemCFTimeZoneMBS as CFTimeZoneMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The current system time zone.

Example:

```
dim s as CFTimeZoneMBS
s=SystemCFTimeZoneMBS
MsgBox s.Name.str
```

Notes: Returns nil on any error.

10.1.65 TypeIDDescriptionMBS(TypeID as Integer) as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns a string with the name for the CoreFoundation data type.

Notes: e.g. "CFStringMBS" for a CFStringMBS.

10.2 class CFAbsoluteTimeMBS

10.2.1 class CFAbsoluteTimeMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: A class for an absolute time value.

Example:

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(T.Value)
```

Notes: Basicly just a double property.
Subclass of the CFTimeIntervalMBS class.

10.2.2 Methods

10.2.3 AddGregorianUnits(timezone as CFTimeZoneMBS, units as CFGregorianUnitsMBS) as CFAbsoluteTimeMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Adds gregorian time units to the given absolute time and returns the result.

Notes: Returns nil on any error.

Timezone is optional and can be nil.

10.2.4 Constructor

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: The constructor to initialize the absoluton time with the current time.

Example:

```
dim CFDateLocal as new CFAbsoluteTimeMBS
dim CFTimeZone as new CFTimeZoneMBS

dim MyDSTState as Boolean = CFTimeZone.IsDaylightSavingTime(CFDateLocal)

MsgBox str(MyDSTState)
```

See also:

- 10.2.5 Constructor(value as Double) 333

10.2.5 Constructor(value as Double)

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: The constructor to initialize the absolute time with the given value.

Example:

```
dim a as new CFAbsoluteTimeMBS(5)
MsgBox str(a.Value)
```

See also:

- 10.2.4 Constructor 332

10.2.6 DayofWeek(timezone as CFTimeZoneMBS) as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns an integer representing the day of the week indicated by the specified date.

Example:

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(t.DayofWeek(nil))
```

10.2.7 DayofYear(timezone as CFTimeZoneMBS) as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns an integer representing the day of the year indicated by the specified date.

Example:

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(t.DayofYear(nil))
```

10.2.8 GetDifferenceAsGregorianUnits(secondtime as CFAbsoluteTimeMBS, timezone as CFTimeZoneMBS, flags as Integer) as CFGregorianUnitsMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns the difference of the two absolute times in gregorian units.

Notes: Timezone is optional and may be nil.

For flags:

```
kCFGregorianUnitsYears      = 1
kCFGregorianUnitsMonths    = 2
kCFGregorianUnitsDays      = 4
kCFGregorianUnitsHours     = 8
kCFGregorianUnitsMinutes   = 16
kCFGregorianUnitsSeconds   = 32
kCFGregorianAllUnits       = &hFFFFFF
```

10.2.9 GregorianCalendarDate(timezone as CFTimeZoneMBS) as CFGregorianCalendarDateMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns the gregorian date for the given absolute time.

Example:

```
dim t as new CFAbsoluteTimeMBS
dim g as CFGregorianCalendarDateMBS = t.GregorianCalendarDate(nil)
MsgBox str(g.Year)
```

Notes: Timezone is optional and can be nil.

Returns nil on any error.

10.2.10 WeekofYear(timezone as CFTimeZoneMBS) as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns an integer representing the week of the year indicated by the specified date.

Example:

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(t.WeekofYear(nil))
```

10.2.11 Properties

10.2.12 Date as CFDateMBS

Plugin Version: 3.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: The date object representing this absolute time value.

Notes: Returns nil on any error.

(Read only property)

10.3 class CFArrayMBS

10.3.1 class CFArrayMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation Array.

Example:

```
// copy names of recent items in Xojo Preferences

dim names() as string
dim c as new CFPREFERENCESMBS

dim o as CFObjectMBS = c.CopyAppValue(NewCFStringMBS("Recent Items Dict"), NewCFStringMBS("com.re-
alsoftware.realstudio"))

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

dim u as Integer = a.Count-1
for i as Integer = 0 to u

o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)

dim no as CFObjectMBS = d.Value(NewCFStringMBS("Name"))
if no isa CFStringMBS then

dim ns as CFStringMBS = CFStringMBS(no)

names.Append ns.str
end if
end if
next
end if

MsgBox Join(names,EndOfLine)
```

Notes: If the release property is true, the destructor of this class will release the array reference.

From CFArrayMBS.h:

CFArray implements an ordered, compact container of pointer-sized values. Values are accessed via integer keys (indices), from the range 0 to N-1, where N is the number of values in the array when an operation is performed. The array is said to be "compact" because deleted or inserted values do not leave a gap in the key space – the values with higher-numbered indices have their indices renumbered lower (or higher, in the case of insertion) so that the set of valid indices is always in the integer range [0, N-1]. Thus, the index to access a particular value in the array may change over time as other values are inserted into or deleted from the array.

Arrays come in two flavors, immutable, which cannot have values added to them or removed from them after the array is created, and mutable, to which you can add values or from which remove values. Mutable arrays have two subflavors, fixed-capacity, for which there is a maximum number set at creation time of values which can be put into the array, and variable capacity, which can have an unlimited number of values (or rather, limited only by constraints external to CFArray, like the amount of available memory). Fixed-capacity arrays can be somewhat higher performing, if you can put a definite upper limit on the number of values that might be put into the array.

As with all CoreFoundation collection types, arrays maintain hard references on the values you put in them, but the retaining and releasing functions are user-defined callbacks that can actually do whatever the user wants (for example, nothing).

Computational Complexity The access time for a value in the array is guaranteed to be at worst $O(\lg N)$ for any implementation, current and future, but will often be $O(1)$ (constant time). Linear search operations similarly have a worst case complexity of $O(N \cdot \lg N)$, though typically the bounds will be tighter, and so on. Insertion or deletion operations will typically be linear in the number of values in the array, but may be $O(N \cdot \lg N)$ clearly in the worst case in some implementations. There are no favored positions within the array for performance; that is, it is not necessarily faster access values with low indices, or to insert or delete values with high indices, or whatever.

This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 23.2pr5](#)
- [MBS Xojo / Real Studio Plugins, version 16.4pr4](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)
- [MBS Real Studio Plugins, version 12.1pr10](#)
- [MBS Real Studio Plugins, version 11.2pr9](#)

10.3.2 Methods

10.3.3 arrayWithContentsOfFile(file as folderitem) as CFArrayMBS

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: Creates and returns an array containing the contents of the file specified by a given path.

Example:

```
dim a as new CFMutableArrayMBS

a.Append NewCFStringMBS("Hello")
a.Append NewCFStringMBS("World")

dim f as FolderItem = SpecialFolder.Desktop.Child("test.xml")

if a.writeToFile(f, true) then
  MsgBox "OK"
else
  MsgBox "Failed"
end if

dim x as CFArrayMBS = CFArrayMBS.arrayWithContentsOfFile(f)
MsgBox x.XML.str
```

Notes: file: The path to a file containing a string representation of an array produced by the writeToFile method.

Returns an array containing the contents of the file specified by aPath. Returns nil if the file can't be opened or if the contents of the file can't be parsed into an array.

The array representation in the file identified by aPath must contain only property list objects (NSString/CFString, NSData/CFData, NSArray/CFArray, or NSDictionary/CFDictionary objects).

Returns nil on any error.

10.3.4 arrayWithContentsOfURL(URL as string) as CFArrayMBS

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: Creates and returns an array containing the contents specified by a given URL.

Notes: URL: The location of a file containing a string representation of an array produced by the writeToURL method.

Returns an array containing the contents specified by aURL. Returns nil if the location can't be opened or if the contents of the location can't be parsed into an array.

The array representation at the location identified by aURL must contain only property list objects (NSString/CF-

String, NSData/CFData, NSArray/CFArray, or NSDictionary/CFDictionary objects).

Returns nil on any error.

10.3.5 arrayWithHandle(Handle as Integer) as CFArrayMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: Creates a new array object based on a handle value.

Notes: Will retain the reference.

10.3.6 AsArray as Variant()

Plugin Version: 23.2, Platform: macOS, Targets: All.

Function: Converts all objects in the CFArray to Xojo variants.

Example:

```
Dim m As New CFMutableArrayMBS
```

```
// add one value
```

```
m.Append NewCFStringMBS("Hello")
```

```
// convert to Xojo array
```

```
Dim a() As Variant = m.AsArray
```

```
// and show value
```

```
MessageBox a(0)
```

10.3.7 clone as CFArrayMBS

Platform: macOS, Targets: All.

Function: Creates a new immutable array with the values from the given array.

Notes: The values itself are not duplicated, but retained.

10.3.8 Constructor

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Creates a new editable array object.

Example:

```
dim b as new CFMutableArrayMBS

b.Append(NewCFStringMBS("Hello"))

MsgBox str(b.Count)
```

See also:

- 10.3.9 Constructor(values() as string) 340

10.3.9 Constructor(values() as string)

Plugin Version: 11.2, Platform: macOS, Targets: All.

Function: Creates a new CFArrayMBS object with CFString objects created from the given string array.

Example:

```
dim values() as string = array("Hello", "World", "Just", "a", "Test")
dim a as new CFArrayMBS(values)

MsgBox str(a.Count)+" elements"
MsgBox a.XML.Str // show as xml
```

See also:

- 10.3.8 Constructor 339

10.3.10 ContainsValue(value as CFOBJECTMBS) as boolean

Platform: macOS, Targets: All.

Function: Reports whether or not the value is in the array.

10.3.11 CountOfValue(value as CFOBJECTMBS) as Integer

Platform: macOS, Targets: All.

Function: Counts the number of times the given value occurs in the array.

10.3.12 Edit as CFMutableArrayMBS

Platform: macOS, Targets: All.

Function: Creates a new mutable array with the values from the current array.

10.3.13 FirstIndexOfValue(value as CObjectMBS) as Integer

Platform: macOS, Targets: All.

Function: Searches the array for the value.

Notes: Result:

The lowest index of the matching values, or -1 if no value matched.

10.3.14 Item(index as Integer) as CObjectMBS

Platform: macOS, Targets: All.

Function: Returns the entry with the given index.

Notes: Index from 0 to count-1.

10.3.15 LastIndexOfValue(value as CObjectMBS) as Integer

Platform: macOS, Targets: All.

Function: Searches the array for the value.

Notes: Result:

The lowest highest of the matching values, or -1 if no value matched.

10.3.16 writeToFile(file as folderitem, useAuxiliaryFile as boolean) as boolean

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: Writes the contents of the receiver to a file at a given path.

Example:

```
dim a as new CFMutableArrayMBS
```

```
a.Append NewCFStringMBS("Hello")
```

```
a.Append NewCFStringMBS("World")
```

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xml")
```

```

if a.writeToFile(f, true) then
  MsgBox "OK"
else
  MsgBox "Failed"
end if

dim x as CFArrayMBS = CFArrayMBS.arrayWithContentsOfFile(f)
MsgBox x.XML.str

```

Notes: file: The path at which to write the contents of the receiver.
 useAuxiliaryFile: If true, the array is written to an auxiliary file, and then the auxiliary file is renamed to path. If false, the array is written directly to path. The true option guarantees that path, if it exists at all, won't be corrupted even if the system should crash during writing.

Returns true if the file is written successfully, otherwise false.

If the receiver's contents are all property list objects (NSString, NSData, NSArray, or NSDictionary objects), the file written by this method can be used to initialize a new array with the class method arrayWithContentsOfFile. This method recursively validates that all the contained objects are property list objects before writing out the file, and returns false if all the objects are not property list objects, since the resultant file would not be a valid property list.

10.3.17 writeToURL(url as string, atomically as boolean) as boolean

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: Writes the contents of the receiver to the location specified by a given URL.

Notes: URL: The location at which to write the receiver.

atomically: If true, the array is written to an auxiliary location, and then the auxiliary location is renamed to aURL. If false, the array is written directly to aURL. The true option guarantees that aURL, if it exists at all, won't be corrupted even if the system should crash during writing.

Returns true if the location is written successfully, otherwise false.

If the receiver's contents are all property list objects (NSString, NSData, NSArray, or NSDictionary objects), the location written by this method can be used to initialize a new array with the class method arrayWithContentsOfURL.

10.3.18 Properties

10.3.19 count as Integer

Platform: macOS, Targets: All.

Function: Returns the number of values currently in the array.

Example:

```
dim x as new CFMutableDictionaryMBS
```

```
x.Add(NewCFStringMBS("Hello"), NewCFStringMBS("World"))
```

```
MsgBox str(x.Count)
```

Notes: (Read only property)

10.4 class CFAttributedStringMBS

10.4.1 class CFAttributedStringMBS

Plugin Version: 10.3, Platform: macOS, Targets: All.

Function: This is the class for a CoreFoundation attributed string.

Notes: Subclass of the CXObjectMBS class.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 14.2pr9](#)
- [MBS Plugins 10.3 Release Notes](#)
- [MBS REALbasic Plugins, version 10.3pr8](#)

10.4.2 Methods

10.4.3 AsNSAttributedString as Variant

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns a new NSAttributedStringMBS object pointing to same attributed string.

Example:

```
// make CF version
dim c as CFAttributedStringMBS = CFAttributedStringMBS.Create("Hello World", nil)
MsgBox c.String

// get NS Version
dim n as NSAttributedStringMBS = c.AsNSAttributedString
MsgBox n.text
```

Notes: For passing to functions which need a NSAttributedStringMBS.

10.4.4 AttributeAndLongestEffectiveRange(location as Integer, attrName as CFStringMBS, inRange as CFRangeMBS, byref effectiveRange as CFRangeMBS) as CXObjectMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns the value of a given attribute of an attributed string at a specified location.

Notes: location: The location in str at which to determine the attributes. It is a programming error for loc to specify a location outside the bounds of str.

attrName: The name of the attribute whose value you want to determine.

inRange: The range in `str` within which you want to find the longest effective range of the attributes at `loc`. `inRange` must not exceed the bounds of `str`.

effectiveRange: upon return contains the maximal range within `inRange` over which the exact same set of attributes apply. The returned range is clipped to `inRange`.

Returns the attribute value of `str` at the specified location.

10.4.5 **AttributesAndLongestEffectiveRange(location as Integer, inRange as CRangeMBS, byref effectiveRange as CRangeMBS) as CDictionaryMBS**

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns the attributes of an attributed string at a specified location.

Notes: `location`: The location in `str` at which to determine the attributes. `loc` must not exceed the bounds of `str`.

inRange: The range in `str` within to find the longest effective range of the attributes at `loc`. `inRange` must not exceed the bounds of `str`.

effectiveRange: upon return contains the maximal range within `inRange` over which the exact same set of attributes apply. The returned range is clipped to `inRange`.

10.4.6 **AttributesDictionary(location as Integer, byref effectiveRange as CRangeMBS) as CDictionaryMBS**

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns the attributes of an attributed string at a specified location.

Notes: `location`: The location in `str` at which to determine the attributes. `loc` must not exceed the bounds of `str`.

effectiveRange: upon return contains a range including `loc` over which exactly the same set of attributes apply as at `loc`.

Returns a dictionary that contains the attributes of `str` at the specified location. Ownership follows the Get Rule.

For performance reasons, a range returned in `effectiveRange` is not necessarily the maximal range. If you need the maximum range, you should use `AttributesAndLongestEffectiveRange`.

Note that the returned attribute dictionary might change in unpredictable ways if the attributed string is edited after this call. If you want to preserve the state of the dictionary, you should make an actual copy of it rather than just retaining it. In addition, you should make no assumptions about the relationship of the actual dictionary returned by this call and the dictionary originally used to set the attributes, other than the fact that the values stored in the dictionaries will be identical (that is, `==`) to those originally specified.

10.4.7 `AttributeValue(location as Integer, attrName as CFStringMBS, byref effectiveRange as CFRangeMBS) as CFObjectMBS`

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns the value of a given attribute of an attributed string at a specified location.

Notes: location: The location in str at which to determine the attributes. loc must not exceed the bounds of str.

attrName: The name of the attribute whose value you want to determine.

effectiveRange: upon return contains a range including loc over which exactly the same set of attributes apply as at location.

Returns the value of the specified attribute at the specified location in str. Ownership follows the Get Rule.

For performance reasons, a range returned in effectiveRange is not necessarily the maximal range. If you need the maximum range, you should use `AttributeAndLongestEffectiveRange`.

10.4.8 `Constructor(str as CFAttributedStringMBS, range as CFRangeMBS)`

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates a sub-attributed string from the specified range.

Notes: str: The attributed string to copy.

range: The range of the attributed string to copy. range must not exceed the bounds of Str.

Returns a new attributed string whose string and attributes are copied from the specified range of the supplied attributed string. Raises `OutOfMemory` exception if there was a problem copying the object. Ownership follows the Create Rule.

See also:

- 10.4.9 `Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil)` 346

10.4.9 `Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil)`

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates an attributed string with specified string and attributes.

Notes: str: A string that specifies the characters to use in the new attributed string. This value is copied.

attributeDictionary: A dictionary that contains the attributes to apply to the new attributed string. This

value is copied.

Returns an attributed string that contains the characters from `str` and the attributes specified by `attributes`. Raises `OutOfMemory` exception if there was a problem in creating the attributed string.

Note that both the string and the attributes dictionary are copied. The specified attributes are applied to the whole string. If you want to apply different attributes to different ranges of the string, you should use a mutable attributed string.

See also:

- 10.4.8 `Constructor(str as CFAttributedStringMBS, range as CFRangeMBS)` 346

10.4.10 Copy as CFAttributedStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates an immutable copy of an attributed string.

10.4.11 Create(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) as CFAttributedStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates an attributed string with specified string and attributes.

Notes: `str`: A string that specifies the characters to use in the new attributed string. This value is copied.
`attributeDictionary`: A dictionary that contains the attributes to apply to the new attributed string. This value is copied.

Returns an attributed string that contains the characters from `str` and the attributes specified by `attributes`. The result is `nil` if there was a problem in creating the attributed string.

Note that both the string and the attributes dictionary are copied. The specified attributes are applied to the whole string. If you want to apply different attributes to different ranges of the string, you should use a mutable attributed string.

10.4.12 CreateWithSubstring(str as CFAttributedStringMBS, range as CFRangeMBS) as CFAttributedStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates a sub-attributed string from the specified range.

Notes: str: The attributed string to copy.

range: The range of the attributed string to copy. range must not exceed the bounds of Str.

Returns a new attributed string whose string and attributes are copied from the specified range of the supplied attributed string. Returns nil if there was a problem copying the object. Ownership follows the Create Rule.

10.4.13 GetLength as Integer

Plugin Version: 10.3, Platform: macOS, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** Queries the length of the string.

Notes: Deprecated in favor of Length property.

10.4.14 GetString as CFStringMBS

Plugin Version: 10.3, Platform: macOS, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** Queries the text of the attributed string.

Notes: Deprecated in favor of String function.

10.4.15 MutableCopy(maxLength as Integer = 0) as CFAttributedStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates a mutable attributed string copy.

Notes: maxLength, if not 0, is a hard bound on the length of the attributed string; exceeding this size limit during any editing operation is a programming error. If 0, there is no limit on the length.

10.4.16 String as CFStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns the string for an attributed string.

Notes: For performance reasons, the string returned will often be the backing store of the attributed string, and it might therefore change if the attributed string is edited. However, this is an implementation detail, and you should not rely on this behavior.

10.4.17 Properties

10.4.18 Length as Integer

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns the length of the attributed string in characters.

Notes: (Read only property)

10.5 class CFBagListMBS

10.5.1 class CFBagListMBS

Platform: macOS, Targets: All.

Function: A class for the items of a CFBag.

10.5.2 Methods

10.5.3 Value(index as Integer) as CObjectMBS

Platform: macOS, Targets: All.

Function: Returns the value with the given index.

10.5.4 Properties

10.5.5 Count as Integer

Platform: macOS, Targets: All.

Function: Counts the items in the set.

Notes: (Read and Write property)

10.6 class CFBagMBS

10.6.1 class CFBagMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation bag.

Notes: If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFOBJECTMBS class.

10.6.2 Methods

10.6.3 clone as CFBagMBS

Platform: macOS, Targets: All.

Function: Clones the set and all values.

10.6.4 Constructor

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: The constructor which creates a new editable bag.

Example:

```
dim b as new CFMutableBagMBS
```

10.6.5 ContainsValue(value as CFOBJECTMBS) as boolean

Platform: macOS, Targets: All.

Function: Does the set contain this value?

10.6.6 CountValue(value as CFOBJECTMBS) as Integer

Platform: macOS, Targets: All.

Function: Counts how often this value is inside the set.

10.6.7 edit as CFMutableBagMBS

Platform: macOS, Targets: All.

Function: To edit a set, this method returns you a CFMutableBagMBS.

10.6.8 List as CFBagListMBS

Platform: macOS, Targets: All.

Function: Returns a list of all values.

Notes: This list will be invalid whenever this set is destroyed.

10.6.9 Value(value as CFOBJECTMBS) as CFOBJECTMBS

Platform: macOS, Targets: All.

Function: If the value is found the value is returned.

Notes: Returns nil if key is not found.

10.6.10 Properties

10.6.11 Count as Integer

Platform: macOS, Targets: All.

Function: Counts all values.

Example:

```
dim b as new CFMutableBagMBS
b.Add(NewCFStringMBS("Hello"))
MsgBox str(b.Count)
```

Notes: (Read only property)

10.7 class CFBinaryDataMBS

10.7.1 class CFBinaryDataMBS

Platform: macOS, Targets: All.

Function: A class for core foundation data.

Notes: If the release property is true, the destructor of this class will release the data reference.

This class works on Windows with QuickTime 7 installed.

This wraps a CFDataRef from Apple. It was named CFBinaryDataMBS instead of CFDataMBS over 10 years ago.

Subclass of the CFObjectMBS class.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 13.4pr2](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)

10.7.2 Methods

10.7.3 clone as CFBinaryDataMBS

Platform: macOS, Targets: All.

Function: Makes a deep copy of the CFBinaryDataMBS object.

10.7.4 Constructor(data as MemoryBlock)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: Creates a new data object with given content.

Example:

```
dim m as MemoryBlock = "Hello"
dim d as new CFBinaryDataMBS(m)
```

```
MsgBox d.Str
```

See also:

- 10.7.5 Constructor(data as string)

10.7.5 Constructor(data as string)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: Creates a new data object with given content.

Example:

```
dim m as string = "Hello"
dim d as new CFBinaryDataMBS(m)
```

```
MsgBox d.Str
```

See also:

- 10.7.4 Constructor(data as MemoryBlock) 353

10.7.6 Edit as CFMutableBinaryDataMBS

Platform: macOS, Targets: All.

Function: Makes a copy of the CFBinaryDataMBS object for editing.

10.7.7 Mem as Memoryblock

Platform: macOS, Targets: All.

Function: The binary data returned as a Xojo memoryblocks.

See also:

- 10.7.8 Mem(pos as Integer,len as Integer) as Memoryblock 354

10.7.8 Mem(pos as Integer,len as Integer) as Memoryblock

Platform: macOS, Targets: All.

Function: The binary data returned as a Xojo memoryblocks.

See also:

- 10.7.7 Mem as Memoryblock 354

10.7.9 Str as String

Platform: macOS, Targets: All.

10.7. CLASS CFBINARYDATAMBS

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Function: The binary data returned as a Xojo string.

See also:

- 10.7.10 Str(pos as Integer,len as Integer) as String

355

10.7.10 Str(pos as Integer,len as Integer) as String

Platform: macOS, Targets: All.

Function: The binary data returned as a Xojo string.

See also:

- 10.7.9 Str as String

354

10.7.11 Properties

10.7.12 len as Integer

Platform: macOS, Targets: All.

Function: The length of this binary data in bytes.

Example:

```
dim b as CFBinaryDataMBS = NewCFBinaryDataMBSStr("Hello")
MsgBox str(b.Len) // shows 5
```

Notes: (Read only property)

10.8 class CFBooleanMBS

10.8.1 class CFBooleanMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation boolean.

Notes: If the release property is true, the destructor of this class will release the boolean reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFObjctMBS class.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 13.4pr2](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)

10.8.2 Methods

10.8.3 Constructor(value as Boolean)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: The constructor.

10.8.4 Operator_Convert as Boolean

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: A helper method for auto conversion between boolean and CFBooleanMBS.

See also:

- 10.8.5 Operator_Convert(v As Boolean) 356

10.8.5 Operator_Convert(v As Boolean)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: A helper method for auto conversion between boolean and CFBooleanMBS.

See also:

- 10.8.4 Operator_Convert as Boolean 356

10.8.6 Properties

10.8.7 Value as boolean

Platform: macOS, Targets: All.

Function: The value of this CFBooleanMBS object.

Notes: (Read only property)

10.9 class CFBundleMBS

10.9.1 class CFBundleMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation bundle.

Example:

```
// get FolderItem
dim f as FolderItem = SpecialFolder.Applications.Child("Safari.app")

// make bundle
dim b as CFBundleMBS = CreateBundleMBS(f)

// make a key
dim k as CFStringMBS = NewCFStringMBS("CFBundleShortVersionString")

// lookup the value
dim i as CFOBJECTMBS = b.GetValueForInfoDictionaryKey(k)

// it's a string, so show it
dim s as CFStringMBS = CFStringMBS(i)
MsgBox s.str
```

Notes: If the release property is true, the destructor of this class will release the boolean reference. Subclass of the CFOBJECTMBS class.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [MBS Xojo Plugins, version 17.3pr1](#)
- [NSBundleMBS and NSDirectoryEnumeratorMBS](#)

10.9.2 Methods

10.9.3 BuiltInPlugInsDirectory as CFURLMBS

Platform: macOS, Targets: All.

Function: The built in plugins folder of the bundle.

Notes: Returns nil on any error.

10.9.4 Constructor

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: The private constructor.

10.9.5 DevelopmentRegion as CFStringMBS

Platform: macOS, Targets: All.

Function: The development region of the bundle.

Notes: Returns nil on any error.

10.9.6 ExecutableFile as CFURLMBS

Platform: macOS, Targets: All.

Function: The executable file of the bundle.

Example:

// The following code does not have any check for nil, so it may crash at any point!

```

dim f as FolderItem
dim c as CFBundleMBS
dim url as CFURLMBS

// Get Path to Mail
f=ApplicationsFolderMBS(-32766).Child("mail.app")

// Make a CFURL from the file
url=NewCFURLMBSFile(f)
// Create a bundle object
c=CreateBundleMBS(url)

// show the path
MsgBox c.ExecutableFile.file.NativePath

```

Notes: Returns nil on any error.

10.9.7 GetInfoDictionary as CFDictionaryMBS

Platform: macOS, Targets: All.

Function: The information dictionary for the bundle.

Notes: Returns nil on any error.

10.9.8 GetLocalInfoDictionary as CFDictionaryMBS

Platform: macOS, Targets: All.

Function: The local information dictionary for the bundle.

Notes: Returns nil on any error.

10.9.9 GetValueForInfoDictionaryKey(key as CFStringMBS) as CFObjectMBS

Platform: macOS, Targets: All.

Function: Returns a value from the information dictionary for the given key.

Example:

```
// lists the document types Mail.app can read
```

```
dim f as FolderItem
dim b as CFBundleMBS
dim u as CFURLMBS
dim s as string
dim a as CFArrayMBS
dim i as Integer
dim c as Integer
dim o as CFObjectMBS
dim d as CFDictionaryMBS
dim t(-1) as string

f=ApplicationsFolderMBS(-32766).Child("Mail.app")
u=NewCFURLMBSFile(f)
b=CreateBundleMBS(u)
o=b.GetValueForInfoDictionaryKey(NewCFStringMBS("CFBundleDocumentTypes"))

if o isa CFArrayMBS then
a=cfarraymbs(o)

c=a.Count-1
for i=0 to c
o=a.Item(i)
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
o=d.Value(NewCFStringMBS("CFBundleTypeName"))
if o isa CFStringMBS then
```

```
s=CFStringMBS(o).str
t.Append s
end if
end if
next
end if

s=Join(t,", ")
MsgBox s
```

Notes: Returns nil on any error.

10.9.10 Identifier as CFStringMBS

Platform: macOS, Targets: All.

Function: The identifier for the bundle.

Notes: Returns nil on any error.

10.9.11 kCFBundleDevelopmentRegionKey as CFStringMBS

Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Notes: Returns nil on any error.

10.9.12 kCFBundleDisplayNameKey as CFStringMBS

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Notes: Display name of the bundle. Can be localized.
Returns nil on any error.

10.9.13 kCFBundleExecutableKey as CFStringMBS

Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Notes: Returns nil on any error.

10.9.14 kCFBundleIdentifierKey as CFStringMBS

Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Example:

```
// Find the bundle id for Mail.app

dim f as FolderItem
dim b as CFBundleMBS
dim u as CFURLMBS
dim s as string
dim o as CFOBJECTMBS

f=ApplicationsFolderMBS(-32766).Child("Mail.app")
u=NewCFURLMBSFile(f)
b=CreateBundleMBS(u)
o=b.GetValueForInfoDictionaryKey(b.kCFBundleIdentifierKey)

if o isa CFStringMBS then
s=cfstringmbs(o).str
end if

msgbox s
```

Notes: Returns nil on any error.

10.9.15 kCFBundleInfoDictionaryVersionKey as CFStringMBS

Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Notes: Returns nil on any error.

10.9.16 kCFBundleNameKey as CFStringMBS

Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Notes: Returns nil on any error.

10.9.17 kCFBundleVersionKey as CFStringMBS

Platform: macOS, Targets: All.

Function: One of the keys for the dictionaries.

Notes: Returns nil on any error.

10.9.18 LocalizedString(key as CFStringMBS) as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Same as the other LocalizedString functions, but the default table and not value is always used.

See also:

- 10.9.19 LocalizedString(key as CFStringMBS, value as CFStringMBS) as CFStringMBS 363
- 10.9.20 LocalizedString(key as CFStringMBS, value as CFStringMBS, TableName as CFStringMBS) as CFStringMBS 363

10.9.19 LocalizedString(key as CFStringMBS, value as CFStringMBS) as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Same as the other LocalizedString functions, but the default table is always used.

See also:

- 10.9.18 LocalizedString(key as CFStringMBS) as CFStringMBS 363
- 10.9.20 LocalizedString(key as CFStringMBS, value as CFStringMBS, TableName as CFStringMBS) as CFStringMBS 363

10.9.20 LocalizedString(key as CFStringMBS, value as CFStringMBS, TableName as CFStringMBS) as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Returns the localized string for the given key and table.

Notes: The table parameter is optional to specify which ".strings"-file to use. without table or table="" the "Localizable.strings" file is used by Mac OS X.

key: The key for the localized string you wish to retrieve. This key will be used to look up the localized string in the strings file. Typically the key is identical to the value of the localized string in the development language.

value: A comment which might assist the translator. As used by the localized string macros and the genstrings tool, this value becomes an annotation in the generated strings file.

tableName: The name of the strings file you wish to search. The name should not include the strings filename extension.

Returns "" (empty string) on Mac OS Classic or Windows.

See also:

- 10.9.18 LocalizedString(key as CFStringMBS) as CFStringMBS 363
- 10.9.19 LocalizedString(key as CFStringMBS, value as CFStringMBS) as CFStringMBS 363

10.9.21 mainBundle as CFBundleMBS

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Returns a CFBundle for the main bundle (current app).

Example:

```
MsgBox CFBundleMBS.MainBundle.Identifier
```

10.9.22 PackageMacCreator as string

Platform: macOS, Targets: All.

Function: The Mac OS creator code for this bundle.

Notes: Returns "" on any error.

10.9.23 PackageMacType as string

Platform: macOS, Targets: All.

Function: The Mac OS file type code for this bundle.

Notes: Returns "" on any error.

Should be "APPL" for applications.

10.9.24 PrivateFrameworksDirectory as CFURLMBS

Platform: macOS, Targets: All.

Function: The private framework folder of the bundle.

Notes: Returns nil on any error.

10.9.25 ResourceDirectory as CFURLMBS

Platform: macOS, Targets: All.

Function: The resource folder of the bundle.

Notes: Returns nil on any error.

10.9.26 ResourceURL(resourceName as CFStringMBS, resourceType as CFStringMBS, subDirName as CFStringMBS) as CFURLMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Searches inside the application bundle for a file.

Example:

```
dim b as CFBundleMBS
```

```
dim u as CFURLMBS
```

```
dim f as FolderItem
```

```
b=app.MainBundleMBS
```

```
u=b.ResourceURL(NewCFStringMBS("Photo"),NewCFStringMBS("tif"),nil)
```

```
f=u.file
```

```
MsgBox f.NativePath
```

```
// e.g. "Content/Resources/Photo.tif" inside your bundle.
```

Notes: ResourceName is the filename of the resource file.

ResourceType is the file extension.

SubDirectory is the name of the directory.

This function will take care for localization folders.

10.9.27 ResourceURLForLocalization(resourceName as CFStringMBS, resourceType as CFStringMBS, subDirName as CFStringMBS, localizationName as CFStringMBS) as CFURLMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Searches inside the application bundle for a file with the given localization.

Notes: ResourceName is the filename of the resource file.

ResourceType is the file extension.

SubDirectory is the name of the directory.

localizationName is the name of the localization requested.

This function will take care for localization folders.

10.9.28 ResourceURLsOfType(resourceType as CFStringMBS, subDirName as CFStringMBS) as CFArrayMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Searches inside the bundle like ResourceURL, but returns an array of all matching files.

10.9.29 ResourceURLsOfTypeForLocalization(resourceType as CFStringMBS, subDirName as CFStringMBS, localizationName as CFStringMBS) as CFArrayMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: Searches inside the bundle like ResourceURLForLocalization, but returns an array of all matching files.

10.9.30 SharedFrameworksDirectory as CFURLMBS

Platform: macOS, Targets: All.

Function: The shared framework folder of the bundle.

Notes: Returns nil on any error.

10.9.31 SharedSupportURL as CFURLMBS

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: The shared support files folder of the bundle.

Notes: Returns nil on any error.

10.9.32 SupportFilesDirectory as CFURLMBS

Platform: macOS, Targets: All.

Function: The support files folder of the bundle.

Notes: Returns nil on any error.

10.9.33 URL as CFURLMBS

Platform: macOS, Targets: All.

Function: The URL for the given bundle.

Notes: Returns nil on any error.

10.9.34 Version as Integer

Platform: macOS, Targets: All.

Function: The version of the bundle.

Notes: Returns nil on any error.

10.10 class CFCharacterSetMBS

10.10.1 class CFCharacterSetMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation character Set.

Notes: If the release property is true, the destructor of this class will release the set reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFOBJECTMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 13.0pr9](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)

10.10.2 Methods

10.10.3 Binary as CFBinaryDataMBS

Platform: macOS, Targets: All.

Function: This function returns the content of the CharacterSet as a CFBinaryData.

Notes: Returns nil on any error.

10.10.4 edit as CFMutableCharacterSetMBS

Platform: macOS, Targets: All.

Function: To edit a character set, this method returns you a CFMutableCharacterSetMBS.

10.10.5 GetPredefinedCFCharacterSet(id as Integer) as CFCharacterSetMBS

Platform: macOS, Targets: All.

Function: Returns a predefined Character set.

10.10.6 IsMember(charcode as Integer) as Boolean

Platform: macOS, Targets: All.

Function: Returns true if the unicode character is part of this CharacterSet.

Notes: Works only for charcode from 0 to &hFFFF.

10.10.7 kCFCharacterSetAlphaNumeric as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for alpha numeric characters.

10.10.8 kCFCharacterSetControl as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for control characters.

10.10.9 kCFCharacterSetDecimalDigit as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for decimal digit characters.

10.10.10 kCFCharacterSetDecomposable as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for decomposable characters.

10.10.11 kCFCharacterSetIllegal as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for illegal characters.

10.10.12 kCFCharacterSetLetter as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for letter characters.

10.10.13 `kCFCharacterSetLowercaseLetter` as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for lowercase letter characters.

10.10.14 `kCFCharacterSetNonBase` as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for non base characters.

10.10.15 `kCFCharacterSetPunctuation` as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for punctuation characters.

10.10.16 `kCFCharacterSetUppercaseLetter` as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for uppercase letter characters.

10.10.17 `kCFCharacterSetWhitespace` as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for whitespace characters.

10.10.18 `kCFCharacterSetWhitespaceAndNewline` as Integer

Platform: macOS, Targets: All.

Function: Returns the ID of the predefined character set for whitespace characters and newline.

10.10.19 NewCFCharacterSet(str as CFBinaryDataMBS) as CFCharacterSetMBS

Platform: macOS, Targets: All.

Function: Returns a Character set with characters inside the CFBinary object.

See also:

- 10.10.20 NewCFCharacterSet(str as CFStringMBS) as CFCharacterSetMBS 371

10.10.20 NewCFCharacterSet(str as CFStringMBS) as CFCharacterSetMBS

Platform: macOS, Targets: All.

Function: Returns a Character set with characters inside the CFStringMBS object.

See also:

- 10.10.19 NewCFCharacterSet(str as CFBinaryDataMBS) as CFCharacterSetMBS 371

10.10.21 NewCFCharacterSetRange(min as Integer, length as Integer) as CFCharacterSetMBS

Platform: macOS, Targets: All.

Function: Returns a Character set with chars between min and max.

Example:

```
dim c as new CFCharacterSetMBS
```

```
c = CFCharacterSetMBS.NewCFCharacterSetRange(asc("A"), 26)
```

```
MsgBox str(c.IsMember(asc("C"))) // true
```

```
MsgBox str(c.IsMember(asc("1"))) // false
```

Notes: Use Unicode charcodes for min and max.

10.11 class CFDateMBS

10.11.1 class CFDateMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation date.

Notes: If the release property is true, the destructor of this class will release the date reference.

Subclass of the CFOjectMBS class.

Blog Entries

- [News from the MBS Xojo Plugins Version 20.5](#)
- [MBS Xojo Plugins, version 19.0pr6](#)

10.11.2 Methods

10.11.3 AbsoluteTime as CFAbsoluteTimeMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The absolute time value for this date.

Notes: Returns nil on any error.

timezone is optional and may be nil.

10.11.4 Compare(otherdate as CFDateMBS) as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Compares two date objects.

Notes: Result codes:

kCFCompareLessThan = -1

kCFCompareEqualTo = 0

kCFCompareGreaterThan = 1

On any error returns 0.

10.11.5 Constructor

Plugin Version: 19.0, Platform: macOS, Targets: All.

Function: Creates new date object with current timestamp.

Example:

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```
dim d as new CFDateMBS
MsgBox d.date.SQLiteDateTime
```

See also:

- 10.11.6 Constructor(date as CFDateMBS) 373
- 10.11.7 Constructor(date as date, timeZone as CFTimeZoneMBS = nil) 373

10.11.6 Constructor(date as CFDateMBS)

Plugin Version: 19.0, Platform: macOS, Targets: All.

Function: Creates a new Xojo object with a copy of the CFDate object inside.

See also:

- 10.11.5 Constructor 372
- 10.11.7 Constructor(date as date, timeZone as CFTimeZoneMBS = nil) 373

10.11.7 Constructor(date as date, timeZone as CFTimeZoneMBS = nil)

Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: The constructor using Xojo date.

Example:

```
// Xojo now
dim d as new date
// convert to CFDate
dim c as new CFDateMBS(d)
// and convert back
dim x as date = c

// compare in de bugger
dim ds as string = d.SQLiteDateTime
dim dx as string = x.SQLiteDateTime
```

Break

Notes: If time zone is nil, we use UTC.

See also:

- 10.11.5 Constructor 372
- 10.11.6 Constructor(date as CFDateMBS) 373

10.11.8 Date(timeZone as CFTimeZoneMBS = nil) as Date

Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a Xojo date from CFDate with given time zone.

Notes: If time zone is nil, we use UTC.

10.11.9 DateTime(timeZone as CFTimeZoneMBS = nil) as DateTime

Plugin Version: 20.5, Platform: macOS, Targets: All.

Function: Creates a Xojo date from CFDate with given time zone.

Notes: If time zone is nil, we use UTC.

10.11.10 NewDate(date as date, timeZone as CFTimeZoneMBS = nil) as CFDateMBS

Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a Xojo date from CFDate with given time zone.

Example:

```
// Xojo now
dim d as new date
// convert to CFDate in UTC
dim c as CFDateMBS = CFDateMBS.NewDate(d, nil)
// and convert back
dim x as date = c.Date(nil)

// compare in debugger
dim ds as string = d.SQLiteDateTime
dim dx as string = x.SQLiteDateTime

// and with current time zone
dim dx2 as string = c.Date(SystemCFTimeZoneMBS).SQLiteDateTime
```

Break

Notes: If time zone is nil, we use UTC.

See also:

- 10.11.11 NewDate(date as dateTime, timeZone as CFTimeZoneMBS = nil) as CFDateMBS

10.11.11 NewDate(date as dateTime, timeZone as CFTimeZoneMBS = nil) as CFDateMBS

Plugin Version: 20.5, Platform: macOS, Targets: All.

Function: Creates a Xojo dateTime from CFDate with given time zone.

Notes: If time zone is nil, we use UTC.

See also:

- 10.11.10 NewDate(date as date, timeZone as CFTimeZoneMBS = nil) as CFDateMBS 374

10.11.12 Now as CFDateMBS

Plugin Version: 19.0, Platform: macOS, Targets: All.

Function: Creates new date object with current timestamp.

Example:

```
dim d as CFDateMBS = CFDateMBS.now
MsgBox d.date.SQLDateTime
```

10.11.13 Operator_Convert as Date

Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Converts from CFDate to Xojo date in UTC.

Example:

```
// Xojo now
dim d as new date
// convert to CFDate
dim c as new CFDateMBS(d)
// and convert back
dim x as date = c

// compare in de bugger
dim ds as string = d.SQLDateTime
dim dx as string = x.SQLDateTime
```

Break

See also:

- 10.11.14 Operator_Convert as DateTime 376

10.11.14 `Operator_Convert` as `DateTime`

Plugin Version: 20.5, Platform: macOS, Targets: All.

Function: Converts from `CFDate` to Xojo `dateTime` in UTC.

See also:

- 10.11.13 `Operator_Convert` as `Date`

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10.11.15 `TimeIntervalSinceDate(otherdate as CFDateMBS)` as `CFTimeIntervalMBS`

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The difference between two dates as a time interval.

Notes: Returns `nil` on any error.

10.12 class CFDictionaryListMBS

10.12.1 class CFDictionaryListMBS

Platform: macOS, Targets: All.

Function: A class for the items of a CFDictionaryMBS.

Notes: This class works on Windows with QuickTime 7 installed.

10.12.2 Methods

10.12.3 close

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

10.12.4 Key(index as Integer) as CFObjectMBS

Platform: macOS, Targets: All.

Function: Returns the key with the given index.

Notes: Index between 0 and count-1.

10.12.5 Value(index as Integer) as CFObjectMBS

Platform: macOS, Targets: All.

Function: Returns the value with the given index.

Notes: Index between 0 and count-1.

10.12.6 Properties

10.12.7 count as Integer

Platform: macOS, Targets: All.

Function: Counts the elements inside this list.

Notes: (Read and Write property)

10.13 class CFDictionaryMBS

10.13.1 class CFDictionaryMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation dictionary.

Example:

```
dim c as new CFPreferencesMBS
dim o as CFObjectMBS = c.CopyAppValue(NewCFStringMBS("VisibleIdentifiers"), NewCFStringMBS("com.apple.speech.voice.prefs"))
dim d as CFDictionaryMBS = CFDictionaryMBS(o)
```

break // see dictionary in debugger

Notes: If the release property is true, the destructor of this class will release the dictionary reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 20.5pr2](#)
- [MBS Xojo Plugins, version 19.1pr1](#)
- [MBS Xojo / Real Studio Plugins, version 16.4pr4](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)
- [MBS Real Studio Plugins, version 12.1pr10](#)
- [MBS Plugins 11.1 Release notes](#)
- [MBS Real Studio Plugins, version 11.1pr8](#)
- [MBS REALbasic Plugins Version 10.4 release notes](#)
- [MBS REALbasic Plugins, version 10.4pr13](#)

10.13.2 Methods

10.13.3 CGPointFromDictionary(dic as CFDictionaryMBS) as variant

Plugin Version: 19.1, Platform: macOS, Targets: All.

Function: Creates CGPointMBS object from dictionary.

Notes: Make a CGPointMBS from the contents of dict (presumably returned earlier from CFDictionaryMBS.dictionaryWithCGPoint) and returns the value in point. Returns object on success; nil otherwise.

10.13.4 CGRectFromDictionary(dic as CFDictionaryMBS) as variant

Plugin Version: 19.1, Platform: macOS, Targets: All.

Function: Creates CGRectMBS object from dictionary.

Notes: Make a CGRect from the contents of dict (presumably returned earlier from CFDictionaryMBS.dictionaryWithCGRect) and returns the value in point. Returns object on success; nil otherwise.

10.13.5 CGSizeFromDictionary(dic as CFDictionaryMBS) as variant

Plugin Version: 19.1, Platform: macOS, Targets: All.

Function: Creates CGSizeMBS object from dictionary.

Notes: Make a CGSize from the contents of dict (presumably returned earlier from CFDictionaryMBS.dictionaryWithCGSize) and returns the value in point. Returns object on success; nil otherwise.

10.13.6 clone as CFDictionaryMBS

Platform: macOS, Targets: All.

Function: Clones the dictionary and all values.

10.13.7 Constructor

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Creates a new editable dictionary.

Example:

```
dim m as new CFMutableDictionaryMBS
m.Add(NewCFStringMBS("Key"), NewCFStringMBS("value"))
MsgBox str(m.Count)
```

See also:

- 10.13.8 Constructor(dic as dictionary)

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10.13.8 Constructor(dic as dictionary)

Plugin Version: 10.4, Platform: macOS, Targets: All.

Function: Creates a new CFDictionary based on the Xojo Dictionary.

Example:

```
// build a dictionary
dim d as new Dictionary

d.Value("Hello")=2
d.Value("test")="World"
d.Value("ddd")=5.6

// convert to CFDictionary
dim c as new CFDictionaryMBS(d)

// Display as XML
dim b as CFBinaryDataMBS = c.XML
MsgBox b.str

// now convert back
dim e as Dictionary = c.dictionary

// and display values
for each key as Variant in e.keys
MsgBox key+" ->" +e.Value(key)
next
```

Notes: Be aware that the Dictionary is converted as good as possible. Unsupported datatype will be missing.

See the FAQ for the supported type translation between CoreFoundation and Xojo data types.
See also:

- 10.13.7 Constructor

10.13.9 ContainsKey(value as CFObjectMBS) as boolean

Platform: macOS, Targets: All.

Function: Does the dictionary contain this key?

Example:

```
dim c as CFMutableDictionaryMBS = NewCFMutableDictionaryMBS

c.Add NewCFStringMBS("test"),NewCFStringMBS("Value")

MsgBox c.XML.Str

if c.ContainsKey(NewCFStringMBS("test")) then
```

```
MsgBox "OK"  
else  
MsgBox "Failed"  
end if  
  
if c.ContainsKey(NewCFStringMBS("missing")) then  
MsgBox "Failed"  
else  
MsgBox "OK"  
end if
```

10.13.10 ContainsValue(value as CObjectMBS) as boolean

Platform: macOS, Targets: All.

Function: Does the dictionary contain this value?

10.13.11 CountKey(value as CObjectMBS) as Integer

Platform: macOS, Targets: All.

Function: Counts how often this key is inside the dictionary.

10.13.12 CountValue(value as CObjectMBS) as Integer

Platform: macOS, Targets: All.

Function: Counts how often this value is inside the dictionary.

10.13.13 Dictionary as Dictionary

Plugin Version: 10.4, Platform: macOS, Targets: All.

Function: Creates a Xojo Dictionary from this CFDictionary.

Example:

```
// build a dictionary  
dim d as new Dictionary  
  
d.Value("Hello")=2  
d.Value("test")="World"
```

```

d.Value("ddd")=5.6

// convert to CFDictionary
dim c as new CFDictionaryMBS(d)

// Display as XML
dim b as CFBinaryDataMBS = c.XML
MsgBox b.str

// now convert back
dim e as Dictionary = c.dictionary

// and display values
for each key as Variant in e.keys
MsgBox key+" ->" + e.Value(key)
next

```

Notes: Be aware that the CFDictionary is converted as good as possible. Unsupported datatype will be missing.

See the FAQ for the supported type translation between CoreFoundation and Xojo data types.

10.13.14 dictionaryWithCGPoint(point as variant) as CFDictionaryMBS

Plugin Version: 19.1, Platform: macOS, Targets: All.

Function: Return a dictionary representation of point.

Notes: Rect must be a CGPointMBS object or nil.

Returns dictionary or nil.

10.13.15 dictionaryWithCGRect(rect as variant) as CFDictionaryMBS

Plugin Version: 19.1, Platform: macOS, Targets: All.

Function: Return a dictionary representation of rect.

Notes: Rect must be a CGRectMBS object or nil.

Returns dictionary or nil.

10.13.16 dictionaryWithCGSize(size as variant) as CFDictionaryMBS

Plugin Version: 19.1, Platform: macOS, Targets: All.

Function: Return a dictionary representation of size.

Notes: Rect must be a CGSizeMBS object or nil.

Returns dictionary or nil.

10.13.17 dictionaryWithContentsOfFile(file as folderitem) as CFDictionaryMBS

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Creates and returns a dictionary using the keys and values found in a file specified by a given path.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")
dim d as CFDictionaryMBS = CFDictionaryMBS.dictionaryWithContentsOfFile(f)
```

```
MsgBox d.XML.Str
```

Notes: path: A full or relative pathname. The file identified by path must contain a string representation of a property list whose root object is a dictionary. The dictionary must contain only property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary).

Returns a new dictionary that contains the dictionary at path, or nil if there is a file error or if the contents of the file are an invalid representation of a dictionary.

10.13.18 dictionaryWithContentsOfURL(URL as string) as CFDictionaryMBS

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Creates and returns a dictionary using the keys and values found in a resource specified by a given URL.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")
dim d as CFDictionaryMBS = CFDictionaryMBS.dictionaryWithContentsOfURL(f.URLPath)
```

```
MsgBox d.XML.Str
```

Notes: URL: An URL that identifies a resource containing a string representation of a property list whose

root object is a dictionary. The dictionary must contain only property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary).

Returns a new dictionary that contains the dictionary at aURL, or nil if there is an error or if the contents of the resource are an invalid representation of a dictionary.

10.13.19 dictionaryWithHandle(Handle as Integer) as CFDictionaryMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: Creates a new dictionary object based on a handle value.

Notes: Will retain the reference.

10.13.20 edit as CFMutableDictionaryMBS

Platform: macOS, Targets: All.

Function: To edit a dictionary, this method returns you a CFMutableDictionaryMBS.

10.13.21 list as CFDictionaryListMBS

Platform: macOS, Targets: All.

Function: Returns a list of all values.

Notes: This list will be invalid whenever this dictionary is destroyed.

10.13.22 Value(key as CFObjectMBS) as CFObjectMBS

Platform: macOS, Targets: All.

Function: If the key is found the value for this key is returned.

Notes: Returns nil if key is not found.

10.13.23 writeToFile(file as folderitem, useAuxiliaryFile as boolean) as boolean

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Writes a property list representation of the contents of the receiver to a given path.

Example:

```

dim m as new CFMutableDictionaryMBS

m.Set(NewCFStringMBS("key"), NewCFStringMBS("value"))

dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")

if m.writeToFile(f, true) then
MsgBox "OK"
else
MsgBox "Failed"
end if

```

Notes: path: The path at which to write the file. Must be an absolute URL.
useAuxiliaryFile: A flag that specifies whether the file should be written atomically.

If flag is true, the receiver is written to an auxiliary file, and then the auxiliary file is renamed to path. If flag is false, the dictionary is written directly to path. The true option guarantees that path, if it exists at all, won't be corrupted even if the system should crash during writing.

Returns true if the file is written successfully, otherwise false.

This method recursively validates that all the contained objects are property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary) before writing out the file, and returns false if all the objects are not property list objects, since the resultant file would not be a valid property list.

If the receiver's contents are all property list objects, the file written by this method can be used to initialize a new dictionary with the class method dictionaryWithContentsOfFile or dictionaryWithContentsOfURL.

10.13.24 writeToURL(url as string, atomically as boolean) as boolean

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Writes a property list representation of the contents of the receiver to a given URL.

Example:

```

dim m as new CFMutableDictionaryMBS

m.Set(NewCFStringMBS("key"), NewCFStringMBS("value"))

dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")

if m.writeToURL(f.URLPath, true) then
MsgBox "OK"

```

```

else
MsgBox "Failed"
end if

```

Notes: url: The URL to which to write the receiver.
atomically: A flag that specifies whether the output should be written atomically.

If flag is YtrueES, the receiver is written to an auxiliary location, and then the auxiliary location is renamed to aURL. If flag is false, the dictionary is written directly to aURL. The true option guarantees that aURL, if it exists at all, won't be corrupted even if the system should crash during writing. flag is ignored if aURL is of a type that cannot be written atomically.

Returns true if the location is written successfully, otherwise false.

This method recursively validates that all the contained objects are property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary) before writing out the file, and returns false if all the objects are not property list objects, since the resultant output would not be a valid property list.

If the receiver's contents are all property list objects, the location written by this method can be used to initialize a new dictionary with the class method dictionaryWithContentsOfURL or dictionaryWithContentsOfFile.

For more information about property lists, see Property List Programming Guide.

10.13.25 Properties

10.13.26 Count as Integer

Platform: macOS, Targets: All.

Function: Counts all values.

Example:

```

dim x as new CFMutableDictionaryMBS
x.Add(NewCFStringMBS("Hello"), NewCFStringMBS("World"))
MsgBox str(x.Count)

```

Notes: (Read only property)

10.14 class CFErrorMBS

10.14.1 class CFErrorMBS

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: The Core Foundation error class.

Notes: A CFError object encapsulates rich and extensible error information than is possible using only an error code or error string. The core attributes of a CFError object are an error domain (represented by a string), a domain-specific error code and a user info dictionary containing application specific information. Errors are required to have a domain and an error code within that domain. The optional "userInfo" dictionary may provide additional information that might be useful for the interpretation and reporting of the error. This dictionary can even contain an "underlying" error, which is wrapped as an error bubbles up through various layers.

Several well-known domains are defined corresponding to Mach, POSIX, and OSStatus errors. In addition, CFError allows you to attach an arbitrary user info dictionary to an error object, and provides the means to return a human-readable description for the error.

In general, a method should signal an error condition by—for example—returning false or nil rather than by the simple presence of an error object. The method can then optionally return a CFError object by reference, in order to further describe the error.

CFError is toll-free bridged to NSError in the Foundation framework—for more details on toll-free bridging, see Interchangeable Data Types. NSError has some additional guidelines which makes it easy to automatically report errors to users and even try to recover from them. See Error Handling Programming Guide for more information on NSError programming guidelines.

Requires Mac OS X 10.5 or newer.

Subclass of the CFObjectMBS class.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [MBS Xojo Plugins, version 19.6pr4](#)
- [MBS REALbasic Plugins, version 10.5pr5](#)

10.14.2 Methods

10.14.3 Constructor

Plugin Version: 20.0, Platform: macOS, Targets: All.

Function: The private constructor.

10.14.4 `kCFErrorDescriptionKey` as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the keys in the userInfo dictionary.

Notes: Key to identify the description in the userInfo dictionary.

When you create a CFError, you can provide a value for this key if you do not have localizable error strings. The description should be a complete sentence if possible, and should not contain the domain name or error

10.14.5 `kCFErrorDomainCocoa` as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the constants defining domains for CFError objects.

Notes: A constant that specified the Cocoa domain.

10.14.6 `kCFErrorDomainMach` as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the constants defining domains for CFError objects.

Notes: A constant that specified the Mach domain.

10.14.7 `kCFErrorDomainOSStatus` as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the constants defining domains for CFError objects.

Notes: A constant that specified the OS domain.

10.14.8 `kCFErrorDomainPOSIX` as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the constants defining domains for CFError objects.

Notes: A constant that specified the POSIX domain.

10.14.9 `kCFErrorLocalizedDescriptionKey` as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the keys in the userInfo dictionary.

Notes: Key to identify the end user-presentable description in the userInfo dictionary.

10.14.10 kCFErrorLocalizedFailureReasonKey as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the keys in the userInfo dictionary.

Notes: Key to identify the end user-presentable failure reason in the userInfo dictionary.

10.14.11 kCFErrorLocalizedRecoverySuggestionKey as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the keys in the userInfo dictionary.

Notes: Key to identify the end user-presentable recovery suggestion in the userInfo dictionary.

10.14.12 kCFErrorUnderlyingErrorKey as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: One of the keys in the userInfo dictionary.

Notes: Key to identify the underlying error in the userInfo dictionary.

10.14.13 Properties

10.14.14 Code as Integer

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns the error code for a given CFError.

Notes: (Read only property)

10.14.15 Description as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns a human-presentable description for a given error.

Notes: (Read only property)

10.14.16 Domain as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns the error domain for a given CFError.

Notes: (Read only property)

10.14.17 FailureReason as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns a human-presentable failure reason for a given error.

Notes: (Read only property)

10.14.18 RecoverySuggestion as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns a human presentable recovery suggestion for a given error.

Notes: (Read only property)

10.14.19 UserInfo as dictionary

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns the user info dictionary for a given CFError.

Notes: (Read only property)

10.15 class CFGregorianDateMBS

10.15.1 class CFGregorianDateMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: A class for a core foundation gregorian date value.

10.15.2 Methods

10.15.3 AbsoluteTime(timezone as CFTimeZoneMBS) as CFAbsoluteTimeMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The absolute time value for this date.

Notes: Returns nil on any error.

10.15.4 DateValid as boolean

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Are all those date properties in this object valid?

10.15.5 IsValid(flags as Integer) as boolean

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns true if the requested parts of the date values are valid.

Notes: Flags can be a combination of the following values:

kCFGregorianUnitsYears	= 1
kCFGregorianUnitsMonths	= 2
kCFGregorianUnitsDays	= 4
kCFGregorianUnitsHours	= 8
kCFGregorianUnitsMinutes	= 16
kCFGregorianUnitsSeconds	= 32
kCFGregorianAllUnits	= &hFFFFFF

Combine using BitwiseOr.

10.15.6 TimeValid as boolean

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Are all those time properties in this object valid?

10.15.7 Valid as boolean

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Are all those properties in this object valid?

10.15.8 Properties

10.15.9 Day as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The day value.

Notes: Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

10.15.10 Hour as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The hour value.

Notes: Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

10.15.11 Minute as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The minute value.

Notes: Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

10.15.12 Month as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The month value.

Notes: Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

10.15.13 Second as Double

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The second value.

Notes: Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

10.15.14 Year as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The year value.

Notes: Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

10.16 class CFGregorianUnitsMBS

10.16.1 class CFGregorianUnitsMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: A class for gregorian time units.

10.16.2 Properties

10.16.3 Days as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The days.

Notes: (Read and Write property)

10.16.4 Hours as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The hours.

Notes: (Read and Write property)

10.16.5 Minutes as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The minutes.

Notes: (Read and Write property)

10.16.6 Months as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The months.

Notes: (Read and Write property)

10.16.7 Seconds as Double

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The seconds.

Notes: (Read and Write property)

10.16.8 Years as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The years.

Notes: (Read and Write property)

10.17 class CFMutableArrayMBS

10.17.1 class CFMutableArrayMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation Array.

Notes: If the release property is true, the destructor of this class will release the array reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFArrayMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 13.0pr1](#)

10.17.2 Methods

10.17.3 Append(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Appends an item to this array.

Example:

```
dim a as CFMutableArrayMBS
```

```
a=NewCFMutableArrayMBS
```

```
a.Append NewCFStringMBS("Hello")
```

```
MsgBox str(a.Count)
```

```
MsgBox CFStringMBS(a.Item(0)).str
```

10.17.4 AppendArray(sourcearray as CFArrayMBS)

Platform: macOS, Targets: All.

Function: Adds the values from an array to another array.

Notes: The whole array should be copied.

See also:

- 10.17.5 AppendArray(sourcearray as CFArrayMBS,min as Integer,max as Integer)

10.17.5 AppendArray(sourcearray as CFArrayMBS,min as Integer,max as Integer)

Platform: macOS, Targets: All.

Function: Adds the values from an array to another array.

Notes: The whole array should be copied.

Min and Max are the range to be copied. Make sure they are correct indexes!

See also:

- 10.17.4 AppendArray(sourcearray as CFArrayMBS)

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10.17.6 Exchange(index1 as Integer,index2 as Integer)

Platform: macOS, Targets: All.

Function: Exchanges the values at two indices of the array.

Notes: Make sure indexes are in range between 0 and count-1.

10.17.7 Insert(index as Integer,value as CFObjectMBS)

Platform: macOS, Targets: All.

Function: Inserts an item to this array.

Notes: Make sure index is in range between 0 and count.

If Index=count then this function does like append.

10.17.8 Remove(index as Integer)

Platform: macOS, Targets: All.

Function: Removes the value with the given index from the array.

Notes: Make sure index is in range between 0 and count-1.

10.17.9 RemoveAll

Platform: macOS, Targets: All.

Function: Removes all the values from the array, making it empty.

10.17.10 SetValue(index as Integer,value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Changes the value with the given index in the array.

10.18 class CFMutableAttributedStringMBS

10.18.1 class CFMutableAttributedStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: The mutable version of an CoreFoundation attributed string.

Notes: Subclass of the CFAttributedStringMBS class.

Blog Entries

- [MBS Xojo / Real Studio plug-ins in version 14.2](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr9](#)

Xojo Developer Magazine

- [12.4, page 9: News](#)

10.18.2 Methods

10.18.3 AsNSMutableAttributedString as Variant

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Returns a new NSMutableAttributedStringMBS object pointing to same mutable attributed string.

Notes: For passing to functions which need a NSMutableAttributedStringMBS.

10.18.4 BeginEditing

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Marks the beginning of a series of changes.

Notes: In cases where attributed string might do a bunch of work to assure self-consistency, BeginEditing/EndEditing allow disabling that to allow deferring and coalescing any work. It's a good idea to call these around a set of related mutation calls which don't require the string to be in consistent state in between. These calls can be nested.

10.18.5 Constructor(maxLength as Integer = 0)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates a mutable empty attributed string.

Notes: maxLength, if not 0, is a hard bound on the length of the attributed string; exceeding this size limit

during any editing operation is a programming error. If 0, there is no limit on the length.

See also:

- 10.18.6 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS) 402
- 10.18.7 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) 402

10.18.6 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates a sub-attributed string from the specified range.

Notes: str: The attributed string to copy.

range: The range of the attributed string to copy. range must not exceed the bounds of Str.

Returns a new attributed string whose string and attributes are copied from the specified range of the supplied attributed string. Raises OutOfMemory exception if there was a problem copying the object. Ownership follows the Create Rule.

See also:

- 10.18.5 Constructor(maxLength as Integer = 0) 401
- 10.18.7 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) 402

10.18.7 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates an attributed string with specified string and attributes.

Notes: str: A string that specifies the characters to use in the new attributed string. This value is copied.

attributeDictionary: A dictionary that contains the attributes to apply to the new attributed string. This value is copied.

Returns an attributed string that contains the characters from str and the attributes specified by attributes. Raises OutOfMemory exception if there was a problem in creating the attributed string.

Note that both the string and the attributes dictionary are copied. The specified attributes are applied to the whole string. If you want to apply different attributes to different ranges of the string, you should use a mutable attributed string.

See also:

- 10.18.5 Constructor(maxLength as Integer = 0) 401
- 10.18.6 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS) 402

10.18.8 EndEditing

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Marks the end of a series of changes.

Notes: In cases where attributed string might do a bunch of work to assure self-consistency, BeginEditing/EndEditing allow disabling that to allow deferring and coalescing any work. It's a good idea to call these around a set of related mutation calls which don't require the string to be in consistent state in between. These calls can be nested.

10.18.9 MutableString as CFMutableStringMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Gets the string for the attributed string as a mutable string, allowing editing the character contents of the string as if it were an CFMutableString.

Notes: Attributes corresponding to the edited range are appropriately modified. If, as a result of the edit, new characters are introduced into the string, they inherit the attributes of the first replaced character from range. If no existing characters are replaced by the edit, the new characters inherit the attributes of the character preceding range if it has any, otherwise of the character following range. If the initial string is empty, the attributes for the new characters are also empty.

(Note: This function is not yet implemented and will return NULL except for toll-free bridged instances.)

10.18.10 RemoveAttribute(Range as CFRangeMBS, attrName as CFStringMBS)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Removes the value of a single attribute over the specified range, which should be valid.

Notes: It's OK for the attribute not to exist over the specified range.

10.18.11 ReplaceAttributedString(Range as CFRangeMBS, Replacement as CFStringMBS)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Replaces the attributed substring over the specified range with the attributed string specified in replacement.

Notes: range should be valid. To delete a range of the attributed string, call ReplaceString() with empty string and specified range.

10.18.12 ReplaceString(Range as CFRangeMBS, Replacement as CFStringMBS)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Modifies the string for the attributed string, much like CFString.Replace.

Notes: It's an error for range to specify characters outside the bounds of aStr.

10.18.13 SetAttribute(Range as CFRangeMBS, attrName as CFStringMBS, Value as CObjectMBS)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Sets the value of a single attribute over the specified range, which should be valid.

Notes: value should not be nil.

10.18.14 SetAttributes(Range as CFRangeMBS, replacements as CFDictionaryMBS, clearOtherAttributes as boolean)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Sets the value of multiple attributes over the specified range, which should be valid.

Notes: If clearOtherAttributes is false, existing attributes (which aren't being replaced) are left alone; otherwise they are cleared. The dictionary should be setup for "usual" CF type usage — CFString keys, and arbitrary CFType values. Note that after this call, further mutations to the replacement dictionary argument by the caller will not affect the contents of the attributed string.

10.19 class CFMutableBagMBS

10.19.1 class CFMutableBagMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation mutable bag.

Notes: If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFBagMBS class.

10.19.2 Methods

10.19.3 Add(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Adds an object to this bag.

10.19.4 Remove(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Removes an object in this bag.

10.19.5 RemoveAll

Platform: macOS, Targets: All.

Function: Removes all items from this bag.

10.19.6 Replace(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Replaces an object in this bag.

10.19.7 Set(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Sets an object in this bag.

10.20 class CFMutableBinaryDataMBS

10.20.1 class CFMutableBinaryDataMBS

Platform: macOS, Targets: All.

Function: A class for core foundation data.

Notes: If the release property is true, the destructor of this class will release the data reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFBinaryDataMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 13.0pr1](#)

10.20.2 Methods

10.20.3 AppendCFBinaryDataMBS(m as CFBinaryDataMBS)

Platform: macOS, Targets: All.

Function: Appends the bytes from the given CFBinary object.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

See also:

- 10.20.4 AppendCFBinaryDataMBS(m as CFBinaryDataMBS,len as Integer) 407

10.20.4 AppendCFBinaryDataMBS(m as CFBinaryDataMBS,len as Integer)

Platform: macOS, Targets: All.

Function: Appends the bytes from the given CFBinary object.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

See also:

- 10.20.3 AppendCFBinaryDataMBS(m as CFBinaryDataMBS) 407

10.20.5 AppendMem(m as memoryblock)

Platform: macOS, Targets: All.

Function: Appends the bytes from the given memoryblock.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with

a small application memory partition size.

See also:

- 10.20.6 AppendMem(m as memoryblock,len as Integer) 408

10.20.6 AppendMem(m as memoryblock,len as Integer)

Platform: macOS, Targets: All.

Function: Appends the bytes from the given memoryblock.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

See also:

- 10.20.5 AppendMem(m as memoryblock) 407

10.20.7 AppendStr(s as string)

Platform: macOS, Targets: All.

Function: Appends the bytes from the given string.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

See also:

- 10.20.8 AppendStr(s as string,len as Integer) 408

10.20.8 AppendStr(s as string,len as Integer)

Platform: macOS, Targets: All.

Function: Appends the bytes from the given string.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

See also:

- 10.20.7 AppendStr(s as string) 408

10.20.9 Constructor(capacity as Integer)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: The constructor for creating a new mutable data object.

Example:

10.20. CLASS CFMUTABLEBINARYDATAMBS

409

```
// creates empty data object  
dim c as new CFMutableBinaryDataMBS(10)  
MsgBox str(c.Len)+" length"
```

See also:

- 10.20.10 Constructor(data as MemoryBlock) 409
- 10.20.11 Constructor(data as string) 409

10.20.10 Constructor(data as MemoryBlock)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: Creates a new data object with given content.

Example:

```
dim m as MemoryBlock = "Hello"  
dim d as new CFMutableBinaryDataMBS(m)
```

MsgBox d.Str

See also:

- 10.20.9 Constructor(capacity as Integer) 408
- 10.20.11 Constructor(data as string) 409

10.20.11 Constructor(data as string)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: Creates a new data object with given content.

Example:

```
dim m as string = "Hello"  
dim d as new CFMutableBinaryDataMBS(m)
```

MsgBox d.Str

See also:

- 10.20.9 Constructor(capacity as Integer) 408

- 10.20.10 Constructor(data as MemoryBlock)

409

10.20.12 Delete(pos as Integer,len as Integer)

Platform: macOS, Targets: All.

Function: Deletes bytes from a binary data object.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

10.20.13 IncreaseLength(extralen as Integer)

Platform: macOS, Targets: All.

Function: Resizes the binary data by extralen adding additional bytes.

Notes: This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

10.20.14 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer)

Platform: macOS, Targets: All.

Function: Replaces len bytes inside the binary data which start at position pos with the bytes from the given binary data.

See also:

- 10.20.15 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer,newlen as Integer) 410

10.20.15 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer,newlen as Integer)

Platform: macOS, Targets: All.

Function: Replaces len bytes inside the binary data which start at position pos with the bytes from the given binary data.

See also:

- 10.20.14 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer) 410

10.20.16 ReplaceMem(m as memoryblock,pos as Integer,len as Integer)

Platform: macOS, Targets: All.

Function: Replaces len bytes inside the binary data which start at position pos with the bytes from the memoryblock.

See also:

- 10.20.17 ReplaceMem(m as memoryblock,pos as Integer,len as Integer,newlen as Integer) 411

10.20.17 ReplaceMem(m as memoryblock,pos as Integer,len as Integer,newlen as Integer)

Platform: macOS, Targets: All.

Function: Replaces len bytes inside the binary data which start at position pos with the bytes from the memoryblock.

See also:

- 10.20.16 ReplaceMem(m as memoryblock,pos as Integer,len as Integer) 411

10.20.18 ReplaceStr(s as string,pos as Integer,len as Integer)

Platform: macOS, Targets: All.

Function: Replaces len bytes inside the binary data which start at position pos with the bytes from the string.

See also:

- 10.20.19 ReplaceStr(s as string,pos as Integer,len as Integer,newlen as Integer) 411

10.20.19 ReplaceStr(s as string,pos as Integer,len as Integer,newlen as Integer)

Platform: macOS, Targets: All.

Function: Replaces len bytes inside the binary data which start at position pos with the bytes from the string.

See also:

- 10.20.18 ReplaceStr(s as string,pos as Integer,len as Integer) 411

10.20.20 SetLength(len as Integer)

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: Sets length of the data.

10.21 class CFMutableCharacterSetMBS

10.21.1 class CFMutableCharacterSetMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation character set.

Notes: If the release property is true, the destructor of this class will release the set reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFCharacterSetMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 13.0pr1](#)

10.21.2 Methods

10.21.3 AddCFStringMBS(s as CFStringMBS)

Platform: macOS, Targets: All.

Function: Adds a range of characters from the CFStringMBS.

10.21.4 AddRange(min as Integer,max as Integer)

Platform: macOS, Targets: All.

Function: Adds a range of characters from min to max to the character set.

10.21.5 Intersect(value as CFCharacterSetMBS)

Platform: macOS, Targets: All.

Function: Makes a intersection between both CFCharacterSets.

10.21.6 Invert

Platform: macOS, Targets: All.

Function: Inverts this character set.

10.21.7 RemoveCFStringMBS(s as CFStringMBS)

Platform: macOS, Targets: All.

Function: Removes a range of characters from the CFStringMBS.

10.21.8 RemoveRange(min as Integer,max as Integer)

Platform: macOS, Targets: All.

Function: Removes a range of characters from min to max to the character set.

10.21.9 Union(value as CFCharacterSetMBS)

Platform: macOS, Targets: All.

Function: Makes a Union between both CFCharacterSets.

10.22 class CFMutableDictionaryMBS

10.22.1 class CFMutableDictionaryMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation dictionary.

Notes: If the release property is true, the destructor of this class will release the dictionary reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFDictionaryMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 13.0pr1](#)

10.22.2 Methods

10.22.3 Add(key as CObjectMBS,value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Adds a key value combination to the dictionary.

Example:

```
dim d as CFMutableDictionaryMBS

d=NewCFMutableDictionaryMBS
d.Add NewCFStringMBS("Key"),NewCFStringMBS("Value")
MsgBox d.XML.str
```

10.22.4 Remove(key as CObjectMBS)

Platform: macOS, Targets: All.

Function: Removes all entries with the given key.

Notes: Maybe no key is found.

10.22.5 RemoveAll

Platform: macOS, Targets: All.

Function: Removes all entries.

10.22.6 Replace(key as CObjectMBS,value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Replaces all entries with the given key to contain the given value.

Notes: Maybe no key is found.

10.22.7 Set(key as CObjectMBS,value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Sets the entry with the given key to the given value.

Example:

```
dim d as new CFMutableDictionaryMBS
```

```
d.Add NewCFStringMBS("Key"), NewCFStringMBS("Value")
```

```
d.Set NewCFStringMBS("Key"), NewCFStringMBS("Value2") // set changes value, add would not change  
it here
```

```
MsgBox d.XML.Str
```

10.23 class CFMutableSetMBS

10.23.1 class CFMutableSetMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation set.

Notes: If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFSetMBS class.

10.23.2 Methods

10.23.3 Add(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Adds an object to this set.

10.23.4 Remove(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Removes an object in this set.

10.23.5 RemoveAll

Platform: macOS, Targets: All.

Function: Removes all items from this set.

10.23.6 Replace(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Replaces an object in this set.

10.23.7 Set(value as CObjectMBS)

Platform: macOS, Targets: All.

Function: Sets an object in this set.

10.24 class CFMutableStringMBS

10.24.1 class CFMutableStringMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation mutable string.

Notes: If the release property is true, the destructor of this class will release the set reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFStringMBS class.

Blog Entries

- [MBS Xojo Plugins, version 18.2pr1](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)

10.24.2 Methods

10.24.3 AppendCFStringMBS(s as CFStringMBS)

Platform: macOS, Targets: All.

Function: Appends the given CFStringMBS.

10.24.4 AppendString(s as String)

Platform: macOS, Targets: All.

Function: Appends the given Xojo string.

10.24.5 Capitalize

Platform: macOS, Targets: All.

Function: Changes the first character represented by a CFStringMBS object to uppercase (if it is a lower-case alphabetical character).

10.24.6 Delete(pos as Integer,len as Integer)

Platform: macOS, Targets: All.

Function: Deletes a range of characters in a mutable CFStringMBS object.

10.24.7 Insert(index as Integer,s as CFStringMBS)

Platform: macOS, Targets: All.

Function: Inserts a string at a specified location in the character buffer of a mutable CFStringMBS object.

10.24.8 LocalizedCapitalize(LocaleIdentifier as String)

Plugin Version: 18.2, Platform: macOS, Targets: All.

Function: Localized capitalize.

Notes: Locale identifier can be "de", "de_DE" or "German" style.

Raises RaiseUnsupportedOperationException if locale identifier is not known.

10.24.9 LocalizedLowercase(LocaleIdentifier as String)

Plugin Version: 18.2, Platform: macOS, Targets: All.

Function: Localized lowercase.

Notes: Locale identifier can be "de", "de_DE" or "German" style.

Raises RaiseUnsupportedOperationException if locale identifier is not known.

10.24.10 LocalizedUppercase(LocaleIdentifier as String)

Plugin Version: 18.2, Platform: macOS, Targets: All.

Function: Localized uppercase.

Example:

```
dim m1 as new CFMutableStringMBS("i")
dim m2 as new CFMutableStringMBS("i")
```

```
m1.Uppercase
m2.LocalizedUppercase("Turkish")
```

```
MsgBox m1.Str+EndOfLine+m2.Str
// shows to variants of capital I
```

Notes: Locale identifier can be "de", "de_DE" or "German" style.
 Raises RaiseUnsupportedOperationException if locale identifier is not known.

10.24.11 Lowercase

Platform: macOS, Targets: All.

Function: Changes all uppercase alphabetical characters in a mutable CFStringMBS to lowercase.

10.24.12 Normalize(NormalizationForm as Integer)

Plugin Version: 4.3, Platform: macOS, Targets: All.

Function: Normalizes the string into the specified form as described in Unicode Technical Report #15.

Example:

```
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS
dim m as CFMutableStringMBS

s=NewCFStringMBS("Hello √©")
m=s.Normalize(kCFStringNormalizationFormD)

MsgBox str(s.Len)+" "+str(m.Len)

// decomposed the length is one more.
```

Notes: Requires Mac OS X 10.2 or newer.

10.24.13 Pad(padstr as CFStringMBS,len as Integer,indexIntoPad as Integer)

Platform: macOS, Targets: All.

Function: Enlarges the string represented by a CFStringMBS object, padding it with specified characters, or truncates the string.

Notes: The CFStringMBS.Pad function has two purposes. It either enlarges the character buffer of a mutable CFStringMBS object to a given length, padding the added length with a given character or characters,

or it truncates the character buffer to a smaller size. The key parameter for this behavior is the length parameter; if it is greater than the current length of the represented string, padding takes place, and if it less than that length, truncation occurs.

For example, say you have a mutable CFStringMBS (aMutStr) containing the characters "abcdef". The call

```
CFStringMBS.Pad(newcfstring(" "), 12, 1)
```

results in aMutStr containing "abcdef . . .". However, the following call

```
CFStringMBS.Pad( nil, 3, 0)
```

results in aMutStr containing "abc".

10.24.14 Replace(newstr as CFStringMBS)

Platform: macOS, Targets: All.

Function: Replaces the content of this CFMutableStringMBS with the one from newstr.

See also:

- 10.24.15 Replace(pos as Integer,len as Integer,newstr as CFStringMBS) 422

10.24.15 Replace(pos as Integer,len as Integer,newstr as CFStringMBS)

Platform: macOS, Targets: All.

Function: Replaces the substring with the given range of this CFMutableStringMBS with the one from newstr.

See also:

- 10.24.14 Replace(newstr as CFStringMBS) 422

10.24.16 Trim

Platform: macOS, Targets: All.

Function: Trims whitespace from the beginning and end of the characters represented by a mutable CFStringMBS object.

See also:

- 10.24.17 Trim(trimchar as CFStringMBS) 423

10.24.17 Trim(trimchar as CFStringMBS)

Platform: macOS, Targets: All.

Function: Trims a specified substring from the beginning and end of the character contents represented by a mutable CFStringMBS object.

See also:

- 10.24.16 Trim

422

10.24.18 Truncate(len as Integer)

Platform: macOS, Targets: All.

Function: If the string is longer than len, it is truncated to len.

10.24.19 Uppercase

Platform: macOS, Targets: All.

Function: Changes all lowercase alphabetical characters in a mutable CFStringMBS object to uppercase.

10.25 class CFNumberMBS

10.25.1 class CFNumberMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation number.

Example:

```
dim n as CFNumberMBS = NewCFNumberMBSDouble(4.3)
```

```
MsgBox str(n.doubleValue)
```

Notes: If the release property is true, the destructor of this class will release the number reference. Subclass of the CFObjectMBS class.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 15.4pr4](#)

10.25.2 Methods

10.25.3 Compare(other as CFNumberMBS) as Integer

Platform: macOS, Targets: All.

Function: Compares two CFNumbers.

Notes: Return values:

Less Than	-1
Equal To	0
Greater Than	1

From CFNumberMBS.h:

Compares the two CFNumberMBS instances. If conversion of the types of the values is needed, the conversion and comparison follow human expectations and not C's promotion and comparison rules. Negative zero compares less than positive zero.

Positive infinity compares greater than everything except itself, to which it compares equal. Negative infinity compares less than everything except itself, to which it compares equal. Unlike standard practice, if both numbers are NaN, then they compare equal; if only one of the numbers is NaN, then the NaN compares greater than the other number if it is negative, and smaller than the other number if it is positive.

10.25.4 NewWithDouble(value as Double) as CFNumberMBS

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Creates a new CFNumberMBS with a 64bit float value.

10.25.5 NewWithInt16(value as Int16) as CFNumberMBS

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Creates a new CFNumberMBS with a 16bit integer value.

10.25.6 NewWithInt32(value as Int32) as CFNumberMBS

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Creates a new CFNumberMBS with a 32bit integer value.

10.25.7 NewWithInt64(value as Int64) as CFNumberMBS

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Creates a new CFNumberMBS with a 64bit integer value.

Example:

```
dim c as CFNumberMBS = CFNumberMBS.NewWithInt64(123456789123456789)
```

```
// shows type. 4 is signed 64-bit integer
```

```
MsgBox str(c.NumberType)+" : "+str(c.int64Value)
```

10.25.8 NewWithInt8(value as Int8) as CFNumberMBS

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Creates a new CFNumberMBS with a 8bit integer value.

10.25.9 NewWithSingle(value as Single) as CFNumberMBS

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Creates a new CFNumberMBS with a 32bit float value.

10.25.10 Properties

10.25.11 ByteSize as Integer

Platform: macOS, Targets: All.

Function: Returns the size in bytes of the type of the number.

Notes: (Read only property)

10.25.12 doubleValue as Double

Platform: macOS, Targets: All.

Function: The value of this CFNumberMBS object.

Notes: (Read only property)

10.25.13 int16Value as Int16

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Queries value as 16bit integer.

Notes: (Read only property)

10.25.14 int32Value as Int32

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Queries value as 32bit integer.

Notes: (Read only property)

10.25.15 int64Value as Int64

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Queries value as 64bit integer.

Example:

```
dim c as CFNumberMBS = CFNumberMBS.NewWithInt64(123456789123456789)
```

```
// shows type. 4 is signed 64-bit integer
MsgBox str(c.NumberType)+" ": "+str(c.int64Value)
```

Notes: (Read only property)

10.25.16 int8Value as Int8

Plugin Version: 15.4, Platform: macOS, Targets: All.

Function: Queries value as 8bit integer.

Notes: (Read only property)

10.25.17 integerValue as Integer

Platform: macOS, Targets: All.

Function: The value of this CFNumberMBS object.

Example:

```
dim n as CFNumberMBS

n=NewCFNumberMBSInteger(45)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSSingle(45.67)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSDouble(45.6789)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

// in version 5.1 of the plugins:
// 45 45 45
// 45.67 0 45.67
// 45.6789 0 0
//
// in version 5.2 of the plugins: (after a fix)
// 45 45 45
// 45.67 45 45.67
```

```
// 45.6789 45 45.6789
```

Notes: Returns a truncated value if the number is not storeable in an integer.
(Read only property)

10.25.18 isFloat as boolean

Platform: macOS, Targets: All.

Function: Returns TRUE if the type of the CFNumberMBS's value is one of the defined floating point types.

Notes: (Read only property)

10.25.19 NumberType as Integer

Platform: macOS, Targets: All.

Function: Returns the storage format of the CFNumberMBS's value.

Notes: Possible values:

Name	Value	Xojo Datatype
SInt8	1	-
SInt16	2	-
SInt32	3	integer
SInt64	4	-
Float32	5	single
Float64	6	double
Char	7	-
Short	8	-
Int	9	-
Long	10	integer
LongLong	11	-
Float	12	single
Double	13	double
CFIndex	14	integer

(Read only property)

10.25.20 singleValue as single

Platform: macOS, Targets: All.

Function: The value of this CFNumberMBS object.

Example:

```
dim n as CFNumberMBS

n=NewCFNumberMBSInteger(45)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSSingle(45.67)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSDouble(45.6789)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

// in version 5.1 of the plugins:
// 45 45 45
// 45.67 0 45.67
// 45.6789 0 0
//
// in version 5.2 of the plugins: (after a fix)
// 45 45 45
// 45.67 45 45.67
// 45.6789 45 45.6789
```

Notes: Returns a truncated value if the number is not storeable in a single.
(Read only property)

10.26 class CObjectMBS

10.26.1 class CObjectMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation object.

Example:

```
// is object is a CFStringMBS, return it a Xojo string.  
Function st(o as CObjectMBS) As string  
if o isa CFStringMBS then  
return CFStringMBS(o).str  
end if  
End Function
```

Notes: If the release property is true, the destructor of this class will release the object reference.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 17.1pr1](#)
- [MBS Xojo / Real Studio Plugins, version 14.3pr2](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr10](#)
- [MBS Xojo / Real Studio Plugins, version 13.2pr5](#)
- [MBS Real Studio Plugins, version 13.0fc1](#)

10.26.2 Methods

10.26.3 close

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

10.26.4 DeepCopy as CObjectMBS

Platform: macOS, Targets: All.

Function: Creates a deep copy of the CObject.

Notes: Copies all sub objects if the Object has sub objects (like the Dictionary).

10.26.5 EncodedData as MemoryBlock

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Returns the content of the object and all subobjects as a binary encoded plist file content.

Notes: Returns nil on any error. For example if you have CFDictionary with keys not being CFStringMBS objects.

You can write this to a plist file.

10.26.6 Equal(o as CObjectMBS) as boolean

Platform: macOS, Targets: All.

Function: Returns true if both CObjects are equal in type and content.

10.26.7 NewCObject(handle as Integer) as CObjectMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates new plugin CObjectMBS around a handle of a CF Type.

Example:

```

// make string
dim s as CFStringMBS = NewCFStringMBS("Hello World")

// get handle
dim h as Integer = s.Handle

// get back from handel to plugin object
dim o as CObjectMBS = CObjectMBS.NewCObject(h)

// and see if plugin detected a string
if o isa CFStringMBS then
dim t as CFStringMBS = CFStringMBS(o)

MsgBox t.str
end if

```

10.26.8 ReleaseObject

Platform: macOS, Targets: All.

Function: Decreases the retain count of this object.

Notes: If the retain count falls below 1, the object is destroyed.

10.26.9 RetainCount as Integer

Platform: macOS, Targets: All.

Function: Returns the reference counter of the object.

Example:

```
dim o as CFObjectMBS
dim s as CFStringMBS

s=NewCFStringMBS("Hello")

MsgBox "s has "+str(s.RetainCount)+" refs in CF"
o=s

MsgBox "o has "+str(o.RetainCount)+" refs in CF"

o.RetainObject

MsgBox "o has "+str(o.RetainCount)+" refs in CF"

o.ReleaseObject

MsgBox "o has "+str(o.RetainCount)+" refs in CF"

o.Close

MsgBox "o has "+str(o.RetainCount)+" refs in CF"
```

Notes: If the retain count falls below 1, the object is destroyed.

10.26.10 RetainObject

Platform: macOS, Targets: All.

Function: Increases the retain count of this object.

Example:

```
Function CFDateFromCFObject(o as cfojectMBS) As cfddateMBS
dim d as CFDateMBS
```

```

if o<>nil then
if o.Type=kCFDateMBSTypeID then
d=new CFDateMBS
d.Handle=o.Handle
d.RetainObject
end if
end if

```

```

Exception
End Function

```

Notes: If the retain count falls below 1, the object is destroyed.

10.26.11 XML as CFBinaryDataMBS

Platform: macOS, Targets: All.

Function: Returns the content of the object and all subobjects as a XML file content.

Example:

```

// Save a dictionary in a XML file:

dim d as CFMutableDictionaryMBS
dim f as FolderItem
dim t as TextOutputStream

// Create dictionary
d=NewCFMutableDictionaryMBS
// Fill dictionary
d.Add NewCFStringMBS("Key"),NewCFStringMBS("Value")

// get file name
f=GetFolderItem("CF XML Test.txt")

// create file
t=f.CreateTextFile
// Write XML
t.Write d.XML.Str
// close file
t.Close

```

Notes: Returns nil on any error. For example if you have CFDictionary with keys not being CFStringMBS objects.

You can write this to a plist file.

10.26.12 XMLdata as String

Plugin Version: 19.0, Platform: macOS, Targets: All.

Function: Returns the content of the object and all subobjects as a XML file content.

Notes: Returns empty string on any error. For example if you have CFDictionary with keys not being CFStringMBS objects.

You can write this to a plist file.

10.26.13 Properties

10.26.14 Handle as Integer

Platform: macOS, Targets: All.

Function: The core foundation object references.

Notes: (Read and Write property)

10.26.15 Hash as Integer

Platform: macOS, Targets: All.

Function: Returns a hash code for this object.

Notes: (Read only property)

10.26.16 Lasterror as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The last error code reported.

Notes: Please check each function on whether it sets the lasterror property.
(Read and Write property)

10.26.17 Type as Integer

Platform: macOS, Targets: All.

Function: Returns the Type ID for this object.

Notes: (Read only property)

10.26.18 TypeDescription as String

Platform: macOS, Targets: All.

Function: Returns the type description for this object.

Notes: e.g. "CFString" or "CFNumber".

(Read only property)

10.27 class CFPreferencesMBS

10.27.1 class CFPreferencesMBS

Platform: macOS, Targets: All.

Function: A class for the core foundation preferences services.

Example:

```
Sub Open()
// in a listbox on a window, list all preferences applications for the current user
dim c as CFArrayMBS
dim p as CFPreferencesMBS
dim i as Integer
dim count as Integer
dim o as CFOBJECTMBS
dim s as CFStringMBS

p=new CFPreferencesMBS
c=p.CopyApplicationList(p.kCFPreferencesCurrentUser, p.kCFPreferencesAnyHost)

count=c.Count-1
for i=0 to count
o=c.Item(i)
if o isa CFStringMBS then
s=CFStringMBS(o)
window1.listbox1.AddRow s.str
end if
next

Title=str(ListBox1.ListCount)+" "+Title
End Sub
```

Notes: Search for Apple Developer documentation on CFPreferences for details on functionality these plugin functions provide.

Blog Entries

- [MBS Real Studio Plugins, version 12.1pr4](#)

10.27.2 Methods

10.27.3 AddSuitePreferencesToApp(ApplicationID as CFStringMBS, SuiteID as CFStringMBS)

Platform: macOS, Targets: All.

Function: Adds a new suite to the application preferences.

10.27.4 AppSynchronize(ApplicationID as CFStringMBS) as boolean

Platform: macOS, Targets: All.

Function: Synchronizes the values in the RAM with the disk for the given application.

Notes: Returns false on any error.

10.27.5 CopyAppBooleanValue(Key as CFStringMBS, ApplicationID as CFStringMBS) as boolean

Platform: macOS, Targets: All.

Function: Copies the application preferences boolean value.

Notes: On an error it returns false and KeyExistsAndHasValidFormat is set to false.

10.27.6 CopyAppIntegerValue(Key as CFStringMBS, ApplicationID as CFStringMBS) as Integer

Platform: macOS, Targets: All.

Function: Copies the application preferences integer value.

Notes: On an error it returns false and KeyExistsAndHasValidFormat is set to false.

10.27.7 CopyApplicationList(userName as CFStringMBS, hostName as CFStringMBS) as CFArrayMBS

Platform: macOS, Targets: All.

Function: Returns a list of all applications which have preferences.

Example:

```
Sub Open()
// in a listbox on a window, list all preferences applications for the current user
dim c as CFArrayMBS
dim p as CFPreferencesMBS
dim i as Integer
dim count as Integer
dim o as CFOBJECTMBS
dim s as CFStringMBS
```

```

p=new CFPreferencesMBS
c=p.CopyApplicationList(p.kCFPreferencesCurrentUser, p.kCFPreferencesAnyHost)

count=c.Count-1
for i=0 to count
o=c.Item(i)
if o isa CFStringMBS then
s=CFStringMBS(o)
ListBox1.AddRow s.str
end if
next

Title=str(ListBox1.ListCount)+" "+Title
End Sub

```

Notes: Returns false on any error.

10.27.8 CopyAppValue(Key as CFStringMBS, ApplicationID as CFStringMBS) as CObjectMBS

Platform: macOS, Targets: All.

Function: Copies the application preferences value.

Example:

```

// copy names of recent items in Xojo Preferences

dim names() as string
dim c as new CFPreferencesMBS

dim o as CObjectMBS = c.CopyAppValue(NewCFStringMBS("Recent Items Dict"), NewCFStringMBS("com.re-
alsoftware.realstudio"))

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

dim u as Integer = a.Count-1
for i as Integer = 0 to u

o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)

```

```

dim no as CObjectMBS = d.Value(NewCFStringMBS("Name"))
if no isa CFStringMBS then

dim ns as CFStringMBS = CFStringMBS(no)

names.Append ns.str
end if
end if
next
end if

MsgBox Join(names,EndOfLine)

```

Notes: Returns nil on any error.

10.27.9 CopyDictionary(ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFDictionaryMBS

Plugin Version: 12.1, Platform: macOS, Targets: All.

Function: Copies all preferences value.

Example:

```

dim p as new CPreferencesMBS

p.SetValue(NewCFStringMBS("TestString"), NewCFStringMBS("Hello World"), p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)
p.SetValue(NewCFStringMBS("TestDouble"), NewCFNumberMBSDouble(5.6), p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)
p.SetValue(NewCFStringMBS("TestInteger"), NewCFNumberMBSInteger(3), p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)

dim d as CFDictionaryMBS = p.CopyDictionary(p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)
dim x as CFBinaryDataMBS = d.XML
dim s as string = x.Str

break
// check data in variable s with xml of all properties

```

Notes: Returns nil on any error.

10.27.10 CopyKeyList(ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFArrayMBS

Platform: macOS, Targets: All.

Function: Returns a list of all preferences keys for the given application.

Notes: Returns false on any error.

10.27.11 CopyMultiple(Key as CFArrayMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFDictionaryMBS

Platform: macOS, Targets: All.

Function: Copies several preferences value.

Notes: Returns nil on any error.

10.27.12 CopyValue(Key as CFStringMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFObjectMBS

Platform: macOS, Targets: All.

Function: Copies a preferences value.

Example:

```

dim c as CFPreferencesMBS
dim o as CFObjectMBS
dim a as CFStringMBS // application
dim k as CFStringMBS // key

k=NewCFStringMBS("AvailableLanguages")
a=NewCFStringMBS("com.apple.systempreferences")

c=new CFPreferencesMBS

o=c.CopyValue(k,a,c.kCFPreferencesCurrentUser,c.kCFPreferencesAnyHost)

CFShowMBS o

// Shows in the console application something like this:
//
// <CFArray >{ type = mutable-small, count = 2, values = (
// 0 : <CFString >{ contents = "en" }

```

```
// 1 : <CFString >{ contents = "de" }  
// ) }
```

Notes: Returns nil on any error.

10.27.13 kCFPreferencesAnyApplication as CFStringMBS

Platform: macOS, Targets: All.

Function: A constant for preferences functions of Mac OS X.

10.27.14 kCFPreferencesAnyHost as CFStringMBS

Platform: macOS, Targets: All.

Function: A constant for preferences functions of Mac OS X.

10.27.15 kCFPreferencesAnyUser as CFStringMBS

Platform: macOS, Targets: All.

Function: A constant for preferences functions of Mac OS X.

10.27.16 kCFPreferencesCurrentApplication as CFStringMBS

Platform: macOS, Targets: All.

Function: A constant for preferences functions of Mac OS X.

10.27.17 kCFPreferencesCurrentHost as CFStringMBS

Platform: macOS, Targets: All.

Function: A constant for preferences functions of Mac OS X.

10.27.18 kCFPreferencesCurrentUser as CFStringMBS

Platform: macOS, Targets: All.

Function: A constant for preferences functions of Mac OS X.

10.27.19 RemoveSuitePreferencesFromApp(ApplicationID as CFStringMBS, SuiteID as CFStringMBS)

Platform: macOS, Targets: All.

Function: Removes a new suite to the application preferences.

10.27.20 SetAppValue(Key as CFStringMBS, value as CObjectMBS, ApplicationID as CFStringMBS)

Platform: macOS, Targets: All.

Function: Sets an application preferences value.

Notes: Note that on saving all strings are internally converted to UTF-8.

10.27.21 SetMultiple(KeysToSet as CFDictionaryMBS, KeysToRemove as CFArrayMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS)

Platform: macOS, Targets: All.

Function: Sets several preferences values.

Notes: Note that on saving all strings are internally converted to UTF-8.

10.27.22 SetValue(Key as CFStringMBS, Value as CObjectMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS)

Platform: macOS, Targets: All.

Function: Sets a preferences value.

Notes: Note that on saving all strings are internally converted to UTF-8.

10.27.23 Synchronize(ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as boolean

Platform: macOS, Targets: All.

Function: Synchronizes the values in the RAM with the disk for the given application.

Notes: Returns false on any error.

10.27.24 Properties

10.27.25 KeyExistsAndHasValidFormat as Boolean

Platform: macOS, Targets: All.

Function: Set by CopyAppBooleanValue and CopyAppIntegerValue.

Notes: (Read and Write property)

10.28 class CFRangeMBS

10.28.1 class CFRangeMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: The class for a CFRange.

Notes: A range of sequential items in a container, such as characters in a buffer or elements in a collection.

Blog Entries

- [MBS Xojo / Real Studio plug-ins in version 14.2](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr10](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr9](#)

Xojo Developer Magazine

- [12.4, page 9: News](#)

10.28.2 Methods

10.28.3 Constructor(location as Integer = 0, length as Integer = 0)

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates a new range with given values.

10.28.4 Properties

10.28.5 length as Integer

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: An integer representing the number of items in the range.

Notes: (Read and Write property)

10.28.6 location as Integer

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: An integer representing the starting location of the range.

Notes: (Read and Write property)

10.29 class CFSetListMBS

10.29.1 class CFSetListMBS

Platform: macOS, Targets: All.

Function: A class for the items of a CFSetMBS.

10.29.2 Methods

10.29.3 Value(index as Integer) as CObjectMBS

Platform: macOS, Targets: All.

Function: Returns the value with the given index.

10.29.4 Properties

10.29.5 Count as Integer

Platform: macOS, Targets: All.

Function: Counts the items in the set.

Notes: (Read and Write property)

10.30 class CFSetMBS

10.30.1 class CFSetMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation set.

Notes: If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFObjectMBS class.

10.30.2 Methods

10.30.3 clone as CFSetMBS

Platform: macOS, Targets: All.

Function: Clones the set and all values.

10.30.4 Constructor

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: Creates a new editable set object.

Example:

```
dim e as new CFMutableSetMBS
e.Add(NewCFStringMBS("Hello"))
MsgBox str(e.Count)
```

10.30.5 ContainsValue(value as CFObjectMBS) as boolean

Platform: macOS, Targets: All.

Function: Does the set contain this value?

10.30.6 CountValue(value as CFObjectMBS) as Integer

Platform: macOS, Targets: All.

Function: Counts how often this value is inside the set.

10.30.7 edit as CFMutableSetMBS

Platform: macOS, Targets: All.

Function: To edit a set, this method returns you a CFMutableSetMBS.

10.30.8 list as CFSetListMBS

Platform: macOS, Targets: All.

Function: Returns a list of all values.

Notes: This list will be invalid whenever this set is destroyed.

10.30.9 Value(value as CObjectMBS) as CObjectMBS

Platform: macOS, Targets: All.

Function: If the value is found the value is returned.

Notes: Returns nil if key is not found.

10.30.10 Properties

10.30.11 Count as Integer

Platform: macOS, Targets: All.

Function: Counts all values.

Example:

```
dim x as new CFMutableSetMBS
x.Set(NewCFStringMBS("Hello"))
MsgBox str(x.Count)
```

Notes: (Read only property)

10.31 class CFStringMBS

10.31.1 class CFStringMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation string.

Example:

```
dim s as CFStringMBS
dim t as CFStringMBS
dim x as string
dim o as CObjectMBS

s=NewCFStringMBS("hello")

// make XML as string
x=s.XML.str

// recreate object from XML
o=NewCObjectMBSFromXML(NewCFBinaryDataMBSStr(x))

if o isa CFStringMBS then
t=CFStringMBS(o)

// show string content
MsgBox t.str
end if
```

Notes: If the release property is true, the destructor of this class will release the string reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 22.5pr1](#)
- [MBS Xojo / Real Studio Plugins, version 16.4pr4](#)
- [MBS Xojo / Real Studio Plugins, version 13.4pr2](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)
- [MBS Real Studio Plugins, version 12.1pr10](#)
- [MBS Plugins 11.1 Release notes](#)
- [MBS Real Studio Plugins, version 11.1pr8](#)

10.31.2 Methods**10.31.3 Character(index as Integer) as string**

Platform: macOS, Targets: All.

Function: Returns the character from this string with the given index.

Notes: The returned Xojo string contains a Unicode character.

10.31.4 Characters(pos as Integer,len as Integer) as string

Platform: macOS, Targets: All.

Function: Returns the characters from this string in the given range.

Notes: The returned Xojo string contains Unicode characters.

10.31.5 Compare(other as CFStringMBS) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Compares two strings.

Notes: Return values:

Less Than	-1
Equal To	0
Greater Than	1
Function not available	-2

See also:

- 10.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer 449
- 10.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer 450
- 10.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer 451

10.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer

Plugin Version: 2.8, Platform: macOS, Targets: All.

Function: Compares two strings.

Notes: Return values:

Less Than	-1
Equal To	0
Greater Than	1
Function not available	-2

See also:

- 10.31.5 Compare(other as CFStringMBS) as Integer 449
- 10.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer 450
- 10.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer 451

10.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Compares two strings.

Example:

```
dim s as CFStringMBS
dim t as CFStringMBS
dim n1,n2 as Integer
```

```
s=NewCFStringMBS("Hello7.txt")
t=NewCFStringMBS("Hello10.txt")
n1=s.Compare(t,false)
```

```
n2=s.Compare(t,false,true)
```

```
MsgBox "Without nummerical: "+str(n1)+", With nummerical: "+str(n2)+""
```

Notes: Numerically works only if Mac OS X 10.2 or newer is running.

Return values:

See also:

- 10.31.5 Compare(other as CFStringMBS) as Integer 449

Less Than	-1
Equal To	0
Greater Than	1
Function not available	-2

- 10.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer 449
- 10.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer 451

10.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer

Plugin Version: 7.1, Platform: macOS, Targets: All.

Function: Compares two strings.

Example:

// Just a quick and dirty test for this function:

```
dim s(10) as string
dim i as Integer
dim temp as string
dim isDirty as boolean
dim a,b as CFStringMBS
```

```
s(1)="Apfel"
s(2)="Strasse"
s(3)="B√§um"
s(4)="Stra√§ie"
s(5)="Zaun"
s(6)="√§pfel"
s(7)="b√§um"
s(8)="Baum"
s(9)="√§pfel"
s(10)="Ende"
```

// if kCFCompareLocalized is used, the √§pfel come near Apfel.

```
const kCFCompareCaseInsensitive = 1
const kCFCompareBackwards = 4 /* Starting from the end of the string */
const kCFCompareAnchored = 8 /* Only at the specified starting point */
const kCFCompareNonliteral = 16 /* If specified, loose equivalence is performed (o-umlaut == o, umlaut)
*/
const kCFCompareLocalized = 32 /* User's default locale is used for the comparisons */
const kCFCompareNumerically = 64 /* Numeric comparison is used; that is, Foo2.txt < Foo7.txt < Foo25.txt
*/
```

```

'Sortieren
do
isDirty = false// we haven't touched anything yet
for i = 1 to 10-1// loop through all the numbers

a=NewCFStringMBS(s(i))
b=NewCFStringMBS(s(i+1))

if a.Compare(b,kCFCompareLocalized)>0 then
temp = s(i+1)
s(i+1) = s(i)
s(i) = temp
isDirty = true// we touched the data so mark it as dirty
end
next
loop until isDirty = false// if we made it without touching the data thenwe are done

for i=1 to 10
EditField1.text=EditField1.text + s(i) + chr(13)
next i

```

Notes: Numerically works only if Mac OS X 10.2 or newer is running.

Return values:

Less Than	-1
Equal To	0
Greater Than	1
Function not available	-2

See also:

- 10.31.5 Compare(other as CFStringMBS) as Integer 449
- 10.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer 449
- 10.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer 450

10.31.9 Constructor(text as string = "")

Plugin Version: 13.4, Platform: macOS, Targets: All.

Function: Creates a new CFString.

Example:

```
dim c as new CFStringMBS("Hello")
MsgBox c
```

10.31.10 Edit as CFMutableStringMBS

Platform: macOS, Targets: All.

Function: Returns a mutable string.

10.31.11 ExactFind(stringtofind as CFStringMBS) as Integer

Platform: macOS, Targets: All.

Function: Finds the given string.

Notes: Exactly, so case sensitive.

10.31.12 Find(stringtofind as CFStringMBS) as Integer

Platform: macOS, Targets: All.

Function: Finds the given string.

10.31.13 HasPrefix(s as CFStringMBS) as boolean

Platform: macOS, Targets: All.

Function: Does this string start with s.

10.31.14 HasSuffix(s as CFStringMBS) as boolean

Platform: macOS, Targets: All.

Function: Does this string end with s.

10.31.15 Mid(pos as Integer,len as Integer) as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns a new CFStringMBS with a substring from the current CFStringMBS.

Notes: Compare to Mid in RB.

10.31.16 Normalize(NormalizationForm as Integer) as CFMutableStringMBS

Plugin Version: 4.3, Platform: macOS, Targets: All.

Function: Normalizes the string into the specified form as described in Unicode Technical Report #15.

Example:

```
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition
```

```
dim s as CFStringMBS
dim m as CFMutableStringMBS
```

```
s=NewCFStringMBS("Hello √©")
m=s.Normalize(kCFStringNormalizationFormD)
```

```
MsgBox str(s.Len)+" "+str(m.Len)
```

```
// decomposed the length is one more.
```

Notes: Requires Mac OS X 10.2 or newer.

Returns nil on any error.

10.31.17 Operator_Convert as String

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: An internal method for Xojo 5.x.

Example:

```
dim s as cfstringmbs
s=NewCFStringMBS("Hello")
msgbox s
```

Notes: This method is used by Xojo 5.x to allow you to directly create a Xojo string based on a CoreFoundation string.

Xojo may create a NilObjectException if the cfstring object is nil.

See also:

- 10.31.18 Operator_Convert(v As String) 455

10.31.18 Operator_Convert(v As String)

Plugin Version: 4.0, Platform: macOS, Targets: All.

Function: An internal method for Xojo 5.x.

Example:

```
dim s as cfstringmbs
s="Hello"
// replaces: s=NewCFStringMBS("Hello")
```

Notes: This method is used by Xojo 5.x to allow you to directly create a corefoundation string object based on a Xojo string.

See also:

- 10.31.17 Operator_Convert as String 454

10.31.19 stringWithHandle(Handle as Integer) as CFStringMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: Creates a new string object based on a handle value.

Notes: Will retain the reference.

10.31.20 Properties

10.31.21 DisplayString as String

Plugin Version: 10.1, Platform: macOS, Targets: All.

Function: For the debugger the string of this CFString reduced to maximum of 1000 characters.

Notes: (Read only property)

10.31.22 DoubleValue as Double

Platform: macOS, Targets: All.

Function: Returns the string interpreted as an double value.

Example:

```
dim d as CFStringMBS = NewCFStringMBS("3.4")
MsgBox str(d.DoubleValue)
```

Notes: Compare to val.

Skips whitespace; returns 0.0 on error.

(Read only property)

10.31.23 FastestEncoding as Integer

Platform: macOS, Targets: All.

Function: Obtains the encoding for the characters in a CFString that requires the least conversion time.

Notes: -1 on Windows.

(Read only property)

10.31.24 IntegerValue as Integer

Platform: macOS, Targets: All.

Function: Returns the string interpreted as an integer value.

Example:

```
dim d as CFStringMBS = NewCFStringMBS("3.4")
MsgBox str(d.IntegerValue) // shows 3
```

Notes: Compare to val.

Skips whitespace; returns 0 on error, MAX or -MAX on overflow.

(Read only property)

10.31.25 Len as Integer

Platform: macOS, Targets: All.

Function: Returns the length in chars of the string.

Notes: (Read only property)

10.31.26 SmallestEncoding as Integer

Platform: macOS, Targets: All.

Function: Obtains the smallest encoding on the current system for the character contents of a CFString object.

Notes: Value is -1 on Windows and Mac OS Classic.
(Read only property)

10.31.27 Str as String

Platform: macOS, Targets: All.

Function: Returns the string data as Xojo string.

Notes: Returns the string in a one byte encoding. If possible ASCII string, else if possible MacRoman encoded else UTF8.

(Read and Write computed property)

10.31.28 UStr as String

Platform: macOS, Targets: All.

Deprecated: This item is deprecated and should no longer be used. You can use Str instead. **Function:** Returns the string data as Xojo unicode string (16bit).

Notes: If the string can not be returned as a unicode string, this function returns it as a normal string in System script (e.g. MacRoman).

(Read and Write computed property)

10.32 class CFTimeIntervalMBS

10.32.1 class CFTimeIntervalMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: A class for a time interval value.

Notes: The time interval is basically a double property inside the class.

10.32.2 Properties

10.32.3 Value as Double

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The value of the class.

Notes: (Read and Write property)

10.33 class CFTimeZoneMBS

10.33.1 class CFTimeZoneMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: A class for a core foundation time zone.

Example:

```
dim t as new CFTimeZoneMBS
MsgBox t.Name.str
```

Notes: Subclass of the CFObjectMBS class.

10.33.2 Methods

10.33.3 Abbreviation(atTime as CFAbsoluteTimeMBS) as CFStringMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The abbreviation for the given timezone name.

Example:

```
dim t as new CFTimeZoneMBS
MsgBox t.Abbreviation(nil)
```

Notes: Returns nil on any error.

As the name may change depending on whether it's daylight saving time, you should give an absolute time value.

10.33.4 Constructor

Plugin Version: 10.0, Platform: macOS, Targets: All.

Function: A constructor which fills the object with the system timezone.

Example:

```
dim CFDateLocal as new CFAbsoluteTimeMBS
dim CFTimeZone as new CFTimeZoneMBS
```

```
dim MyDSTState as Boolean = CFTimeZone.IsDaylightSavingTime(CFDateLocal)
```

```
MsgBox str(MyDSTState)
```

10.33.5 Data as CFBinaryDataMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The binary data for the timezone.

Example:

```
dim t as new CFTimeZoneMBS
MsgBox t.Data.Str
```

10.33.6 IsDaylightSavingTime(atTime as CFAbsoluteTimeMBS) as boolean

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: whether it's daylight saving time at the given absolute time.

Example:

```
// get current timezone
dim c as CFTimeZoneMBS = SystemCFTimeZoneMBS

// and current time
dim time as CFAbsoluteTimeMBS = CurrentCFAbsoluteTimeMBS

// Do we have daylight saving time?
MsgBox str(c.IsDaylightSavingTime(time))
```

10.33.7 Name as CFStringMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The name of the timezone.

Example:

```
dim s as CFTimeZoneMBS
s=SystemCFTimeZoneMBS
MsgBox s.Name
```

10.33.8 SecondsFromGMT(atTime as CFAbsoluteTimeMBS) as CFTimeIntervalMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns the time difference to GMT for the given time (for daylight saving).

Example:

```
dim s as cfTimeZoneMBS
s=SystemCFTimeZoneMBS
MsgBox str(s.SecondsFromGMT(nil).Value) // 3600 in Germany
```

Notes: Returns nil on any error.

10.34 class CFURLMBS

10.34.1 class CFURLMBS

Platform: macOS, Targets: All.

Function: A class for a core foundation boolean.

Notes: If the release property is true, the destructor of this class will release the url reference.

This class works on Windows with QuickTime 7 installed.

Subclass of the CFOjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 20.5pr6](#)
- [MBS Xojo Plugins, version 17.4pr2](#)
- [MBS Xojo Plugins, version 17.1pr4](#)
- [MBS Xojo / Real Studio Plugins, version 16.4pr3](#)
- [MBS Xojo / Real Studio Plugins, version 14.1pr2](#)
- [MBS Real Studio Plugins, version 13.0pr1](#)
- [MBS Real Studio Plugins, version 12.1pr10](#)

10.34.2 Methods

10.34.3 AbsoluteURL as CFURLMBS

Platform: macOS, Targets: All.

Function: Returns the absolute URL.

Notes: A URL contains normally a base and a relative part. This function creates one absolute URL from those parts.

10.34.4 AppendPathComponent(pathcomponent as CFStringMBS,isDirectory as boolean) as CFURLMBS

Platform: macOS, Targets: All.

Function: Appends a path component to this URL.

10.34.5 AppendPathExtension(extension as CFStringMBS) as CFURLMBS

Platform: macOS, Targets: All.

Function: Appends a path extension to this URL.

10.34.6 BaseURL as CFURLMBS

Platform: macOS, Targets: All.

Function: Returns the base URL.

Notes: A URL contains normally a base and a relative part.

10.34.7 CanBeDecomposed as boolean

Platform: macOS, Targets: All.

Function: Can this url be decomposed?

10.34.8 Constructor(File as FolderItem)

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Creates new CFURLMBS based on given folderitem.

Notes: Raises exception if not called on macOS or called with invalid URL.

See also:

- 10.34.9 Constructor(URL as string)

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10.34.9 Constructor(URL as string)

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Creates new CFURLMBS based on given URL.

Notes: Raises exception if not called on macOS or called with invalid URL.

See also:

- 10.34.8 Constructor(File as FolderItem)

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10.34.10 `Data(encoding as Integer, escapeWhitespace as boolean) as CFBinaryDataMBS`

Platform: macOS, Targets: All.

Function: Returns the URL as binary data using the given encoding.

10.34.11 `DeleteLastPathComponent as CFURLMBS`

Platform: macOS, Targets: All.

Function: Deletes the last path component of this URL.

10.34.12 `DeletePathExtension as CFURLMBS`

Platform: macOS, Targets: All.

Function: Deletes the path extension of this URL.

10.34.13 `DisplayName as CFStringMBS`

Plugin Version: 2.9, Platform: macOS, Targets: All.

Function: Returns the display name for the url.

Notes: Returns "" on any error.

10.34.14 `file as folderitem`

Plugin Version: 2.7, Platform: macOS, Targets: All.

Function: Returns the URL as a folderitem.

Notes: Works only on RB 4.5 or later and if the file exists.

10.34.15 `Fragment(charactersToLeaveEscaped as CFStringMBS) as CFStringMBS`

Platform: macOS, Targets: All.

Function: Returns the Fragment part of this URL.

10.34.16 HasDirectoryPath as boolean

Platform: macOS, Targets: All.

Function: Has this URL a directory path?

10.34.17 HFSFilePath as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the URL as HFSFilePath.

10.34.18 HostName as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the HostName part of this URL.

10.34.19 isAbsolutePath as boolean

Platform: macOS, Targets: All.

Function: Is the path an absolute path?

10.34.20 kCFURLAddedToDirectoryDateKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The date the resource was created, or renamed into or within its parent directory. Note that inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes. (Read-only, value type CFDateMBS)
for macOS 10.10 or later.

10.34.21 kCFURLApplicationIsScriptableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True if the resource is scriptable. Only applies to applications. (Read-only, value type CFBoolean-

MBS)

for macOS 10.11 or later.

10.34.22 kCFURLAttributeModificationDateKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The time the resource's attributes were last modified (Read-only, value type CFDateMBS)

10.34.23 kCFURLCanonicalPathKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: the URL's path as a canonical absolute file system path (Read-only, value type CFStringMBS) for macOS 10.12 or later.

10.34.24 kCFURLContentAccessDateKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The date the resource was last accessed (Read-only, value type CFDateMBS)

10.34.25 kCFURLContentModificationDateKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The time the resource content was last modified (Read-write, value type CFDateMBS)

10.34.26 kCFURLCreationDateKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The date the resource was created (Read-write, value type CFDateMBS)

10.34.27 kCFURLDocumentIdentifierKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The document identifier – a value assigned by the kernel to a document (which can be either a file or directory) and is used to identify the document regardless of where it gets moved on a volume. The document identifier survives "safe save" operations; i.e it is sticky to the path it was assigned to (NSURL -replaceItemAtURL:withItemAtURL:backupItemName:options:resultingItemURL:error: is the preferred safe-save API). The document identifier is persistent across system restarts. The document identifier is not transferred when the file is copied. Document identifiers are only unique within a single volume. This property is not supported by all volumes. (Read-only, value type CFNumberMBS) for macOS 10.10 or later.

10.34.28 kCFURLFileAllocatedSizeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total size allocated on disk for the file in bytes (number of blocks times block size) (Read-only, value type CFNumberMBS)

10.34.29 kCFURLFileResourceIdentifierKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: An identifier which can be used to compare two file system objects for equality using CFObjectMBS.Equal (i.e, two object identifiers are equal if they have the same file system path or if the paths are linked to same inode on the same file system). This identifier is not persistent across system restarts. (Read-only, value type CFObjectMBS)

10.34.30 kCFURLFileResourceTypeBlockSpecial as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: Special block device.

10.34.31 kCFURLFileResourceTypeCharacterSpecial as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: Special charset device.

10.34.32 kCFURLFileResourceTypeDirectory as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: A folder.

10.34.33 kCFURLFileResourceTypeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Returns the file system object type. (Read-only, value type CFStringMBS) for macOS 10.7 or later.

10.34.34 kCFURLFileResourceTypeNamedPipe as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: A named pipe.

10.34.35 kCFURLFileResourceTypeRegular as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: Regular file.

10.34.36 kCFURLFileResourceTypeSocket as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: A network socket.

10.34.37 kCFURLFileResourceTypeSymbolicLink as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: An symbolic link.

10.34.38 kCFURLFileResourceTypeUnknown as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the file resource type values.

Notes: Unknown.

10.34.39 kCFURLFileSecurityKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The file system object's security information encapsulated in a CFFileSecurity object. (Read-write, value type CFFileSecurity)

10.34.40 kCFURLFileSizeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total file size in bytes (Read-only, value type CFNumberMBS)

10.34.41 kCFURLGenerationIdentifierKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: An opaque generation identifier which can be compared using CFOBJECTMBS.Equal() to determine if the data in a document has been modified. For URLs which refer to the same file inode, the generation identifier will change when the data in the file's data fork is changed (changes to extended attributes or other

file system metadata do not change the generation identifier). For URLs which refer to the same directory inode, the generation identifier will change when direct children of that directory are added, removed or renamed (changes to the data of the direct children of that directory will not change the generation identifier). The generation identifier is persistent across system restarts. The generation identifier is tied to a specific document on a specific volume and is not transferred when the document is copied to another volume. This property is not supported by all volumes. (Read-only, value type CFObjectMBS) for macOS 10.10 or later.

10.34.42 kCFURLHasHiddenExtensionKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for resources whose filename extension is removed from the localized name property (Read-write, value type CFBooleanMBS)

10.34.43 kCFURLIsAliasFileKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the resource is a Finder alias file or a symlink, false otherwise (Read-only, value type CFBooleanMBS)

10.34.44 kCFURLIsApplicationKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True if resource is an application (Read-only, value type CFBooleanMBS) for macOS 10.11 or later.

10.34.45 kCFURLIsDirectoryKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for directories (Read-only, CFBooleanMBS)

10.34.46 kCFURLIsExcludedFromBackupKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if resource should be excluded from backups, false otherwise (Read-write, value type CFBooleanMBS). This property is only useful for excluding cache and other application support files which are not needed in a backup. Some operations commonly made to user documents will cause this property to be reset to false and so this property should not be used on user documents.
for macOS 10.8 or later.

10.34.47 kCFURLIsExecutableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if this process (as determined by EUID) can execute a file resource or search a directory resource. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or later.

10.34.48 kCFURLIsHiddenKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for resources normally not displayed to users (Read-write, value type CFBooleanMBS).

If the resource is a hidden because its name starts with a period, setting this property to false will not change the property.

10.34.49 kCFURLIsMountTriggerKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if this URL is a file system trigger directory. Traversing or opening a file system trigger will cause an attempt to mount a file system on the trigger directory. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or later.

10.34.50 kCFURLIsPackageKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim c as CFURLMBS = NewCFURLMBSFile(f)

dim v as Variant
dim e as CFErrorMBS

if c.ResourcePropertyForKey(c.kCFURLIsPackageKey, v1, e) then
dim p as CFBooleanMBS = v

MsgBox "IsPackage: "+str(p.Value)
else
MsgBox "Error: "+e.Description
end if
```

Notes: True for packaged directories (Read-only 10.6 and 10.7, read-write 10.8, value type CFBooleanMBS).

You can only set or clear this property on directories; if you try to set this property on non-directory objects, the property is ignored. If the directory is a package for some other reason (extension type, etc), setting this property to false will have no effect.

10.34.51 kCFURLIsReadableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if this process (as determined by EUID) can read the resource. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or later.

10.34.52 kCFURLIsRegularFileKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for regular files (Read-only, value type CFBooleanMBS)

10.34.53 kCFURLIsSymbolicLinkKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for symlinks (Read-only, value type CFBooleanMBS)

10.34.54 kCFURLIsSystemImmutableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for system-immutable resources (Read-write, value type CFBooleanMBS)

10.34.55 kCFURLIsUbiquitousItemKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if this item is synced to the cloud, false if it is only a local file. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or newer.

10.34.56 kCFURLIsUserImmutableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for user-immutable resources (Read-write, value type CFBooleanMBS)

10.34.57 kCFURLIsVolumeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: True for the root directory of a volume (Read-only, value type CFBooleanMBS)

10.34.58 kCFURLIsWritableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if this process (as determined by EUID) can write to the resource. (Read-only, value type CFBooleanMBS)

for mac OS 10.7 or later.

10.34.59 kCFURLLabelNumberKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The label number assigned to the resource (Read-write, value type CFNumberMBS)

10.34.60 kCFURLLinkCountKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Number of hard links to the resource (Read-only, value type CFNumberMBS)

10.34.61 kCFURLLocalizedLabelKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The user-visible label text (Read-only, value type CFStringMBS)

10.34.62 kCFURLLocalizedNameKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Localized or extension-hidden name as displayed to users (Read-only, value type CFStringMBS)

10.34.63 kCFURLLocalizedTypeDescriptionKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: User-visible type or "kind" description (Read-only, value type CFStringMBS)

10.34.64 kCFURLNameKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The resource name provided by the file system (Read-write, value type CFStringMBS)

10.34.65 kCFURLParentDirectoryURLKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The resource's parent directory, if any (Read-only, value type CFURLMBS)

10.34.66 kCFURLPathKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: the URL's path as a file system path (Read-only, value type CFStringMBS) for macOS 10.8 or later.

10.34.67 kCFURLPreferredIOBlockSizeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The optimal block size when reading or writing this file's data, or NULL if not available. (Read-only, value type CFNumberMBS)

10.34.68 kCFURLQuarantinePropertiesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Example:

```
Dim f As FolderItem = SpecialFolder.UserHome.Child("Downloads").Child("Installation.pdf")
Dim n As New CFURLMBS(f)
```

```
Dim d As CFDictionaryMBS
```

```
Dim v As Variant
```

```
Dim e As CFErrorMBS
```

```
If n.ResourcePropertyForKey(n.kCFURLQuarantinePropertiesKey, v, e) Then
```

```
  d = v
```

```
  Dim dic As Dictionary = d.Dictionary
```

```
  Break // inspect in debugger
```

```
Else
```

```
  Break // failed
```

```
End If
```

Notes: The quarantine properties as defined in LSQuarantine.h. To remove quarantine information from a file, pass kCFNull as the value when setting this property. (Read-write, value type CFDictionaryMBS) for macOS 10.10 or later.

10.34.69 kCFURLTagNamesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The array of Tag names (Read-write, value type CFArrayMBS of CFStringMBS) for macOS 10.9 or later.

10.34.70 kCFURLTotalFileAllocatedSizeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total allocated size of the file in bytes (this may include space used by metadata), or nil if not available. This can be less than the value returned by kCFURLTotalFileSizeKey if the resource is compressed. (Read-only, value type CFNumberMBS)

10.34.71 kCFURLTotalFileSizeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total displayable size of the file in bytes (this may include space used by metadata), or NULL if not available. (Read-only, value type CFNumberMBS)

10.34.72 kCFURLTypeIdentifierKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Uniform type identifier (UTI) for the resource (Read-only, value type CFStringMBS)

10.34.73 kCFURLUbiquitousItemDownloadingErrorKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: returns the error when downloading the item from iCloud failed. See the NSUbiquitousFile section in FoundationErrors.h. (Read-only, value type CFErrorMBS) for macOS 10.9 or later.

10.34.74 kCFURLUbiquitousItemDownloadingStatusCurrent as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the download status values.

Notes: there is a local version of this item and it is the most up-to-date version known to this device. for macOS 10.9 or later.

10.34.75 kCFURLUbiquitousItemDownloadingStatusDownloaded as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the download status values.

Notes: there is a local version of this item available. The most current version will get downloaded as soon as possible. for macOS 10.9 or later.

10.34.76 kCFURLUbiquitousItemDownloadingStatusKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Returns the download status of this item. (Read-only, value type CFStringMBS). for macOS 10.9 or later.

10.34.77 kCFURLUbiquitousItemDownloadingStatusNotDownloaded as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the download status values.

Notes: this item has not been downloaded yet. Use `NSFileManager`'s `startDownloadingUbiquitousItemAtURL:error:` to download it.
for macOS 10.9 or later.

10.34.78 kCFURLUbiquitousItemHasUnresolvedConflictsKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if this item has conflicts outstanding. (Read-only, value type `CFBooleanMBS`)

10.34.79 kCFURLUbiquitousItemIsDownloadedKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Equivalent to `NSURLUbiquitousItemDownloadingStatusKey = NSURLUbiquitousItemDownloadingStatusCurrent`. Has never behaved as documented in earlier releases, hence deprecated. (Read-only, value type `CFBooleanMBS`)

10.34.80 kCFURLUbiquitousItemIsDownloadingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if data is being downloaded for this item. (Read-only, value type `CFBooleanMBS`)

10.34.81 kCFURLUbiquitousItemIsExcludedFromSyncKey as CFStringMBS

Plugin Version: 21.5, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Value is a boolean.

The item is excluded from sync, which means it is locally on disk but won't be available on the server. An excluded item is no longer ubiquitous.

10.34.82 kCFURLUbiquitousItemIsUploadedKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if there is data present in the cloud for this item. (Read-only, value type CFBooleanMBS)

10.34.83 kCFURLUbiquitousItemIsUploadingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if data is being uploaded for this item. (Read-only, value type CFBooleanMBS)

10.34.84 kCFURLUbiquitousItemPercentDownloadedKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Percent downloaded.

Use NSMetadataQuery and NSMetadataUbiquitousItemPercentDownloadedKey on NSMetadataItem instead.

10.34.85 kCFURLUbiquitousItemPercentUploadedKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Percent uploaded.

Use NSMetadataQuery and NSMetadataUbiquitousItemPercentUploadedKey on NSMetadataItem instead

10.34.86 kCFURLUbiquitousItemUploadingErrorKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: returns the error when uploading the item to iCloud failed. See the NSUbiquitousFile section in FoundationErrors.h. (Read-only, value type CFErrorMBS)
for macOS 10.9 or later.

10.34.87 kCFURLVolumeAvailableCapacityKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total free space in bytes (Read-only, value type CFNumberMBS)

10.34.88 kCFURLVolumeCreationDateKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The volume's creation date, or nil if this cannot be determined. (Read-only, value type CFDateMBS)

10.34.89 kCFURLVolumeIdentifierKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: An identifier that can be used to identify the volume the file system object is on. Other objects on the same volume will have the same volume identifier and can be compared using for equality using `CFObjectMBS.Equal`. This identifier is not persistent across system restarts. (Read-only, value type `CFObjectMBS`)

10.34.90 kCFURLVolumeIsAutomountedKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume is automounted. Note: do not mistake this with the functionality provided by `kCFURLVolumeSupportsBrowsingKey`. (Read-only, value type `CFBooleanMBS`)

10.34.91 kCFURLVolumeIsBrowsableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume should be visible via the GUI (i.e., appear on the Desktop as a separate volume). (Read-only, value type `CFBooleanMBS`)

10.34.92 kCFURLVolumeIsEjectableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume's media is ejectable from the drive mechanism under software control. (Read-only, value type CFBooleanMBS)

10.34.93 kCFURLVolumeIsEncryptedKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume is encrypted. (Read-only, value type CFBooleanMBS) for macOS 10.12 or later.

10.34.94 kCFURLVolumeIsInternalKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume's device is connected to an internal bus, false if connected to an external bus, or nil if not available. (Read-only, value type CFBooleanMBS)

10.34.95 kCFURLVolumeIsJournalingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume is currently using a journal for speedy recovery after an unplanned restart. (Read-only, value type CFBooleanMBS)

10.34.96 kCFURLVolumeIsLocalKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume is stored on a local device. (Read-only, value type CFBooleanMBS)

10.34.97 kCFURLVolumeIsReadOnlyKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume is read-only. (Read-only, value type CFBooleanMBS)

10.34.98 kCFURLVolumeIsRemovableKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume's media is removable from the drive mechanism. (Read-only, value type CFBooleanMBS)

10.34.99 kCFURLVolumeIsRootFileSystemKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume is the root filesystem. (Read-only, value type CFBooleanMBS) for macOS 10.12 or later.

10.34.100 kCFURLVolumeLocalizedFormatDescriptionKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The user-visible volume format (Read-only, value type CFStringMBS)

10.34.101 kCFURLVolumeLocalizedNameKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The user-presentable name of the volume (Read-only, value type CFStringMBS)

10.34.102 kCFURLVolumeMaximumFileSizeKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The largest file size (in bytes) supported by this file system, or nil if this cannot be determined.
(Read-only, value type CFNumberMBS)

10.34.103 kCFURLVolumeNameKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The name of the volume (Read-write, settable if kCFURLVolumeSupportsRenamingKey is true and permissions allow, value type CFStringMBS)

10.34.104 kCFURLVolumeResourceCountKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total number of resources on the volume (Read-only, value type CFNumberMBS)

10.34.105 kCFURLVolumeSupportsAdvisoryFileLockingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume implements whole-file flock(2) style advisory locks, and the O_EXLOCK and O_SHLOCK flags of the open(2) call. (Read-only, value type CFBooleanMBS)

10.34.106 kCFURLVolumeSupportsCasePreservedNamesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format preserves the case of file and directory names. Otherwise the volume may change the case of some characters (typically making them all upper or all lower case). (Read-only, value type CFBooleanMBS)

10.34.107 kCFURLVolumeSupportsCaseSensitiveNamesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format treats upper and lower case characters in file and directory names as different. Otherwise an upper case character is equivalent to a lower case character, and you can't have two names that differ solely in the case of the characters. (Read-only, value type CFBooleanMBS)

10.34.108 kCFURLVolumeSupportsCompressionKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume supports transparent decompression of compressed files using decmpfs. (Read-only, value type CFBooleanMBS)
for macOS 10.12.

10.34.109 kCFURLVolumeSupportsExclusiveRenamingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume supports `renamex_np(2)`'s `RENAME_EXCL` option (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

10.34.110 kCFURLVolumeSupportsExtendedSecurityKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume implements extended security (ACLs). (Read-only, value type CFBooleanMBS)

10.34.111 kCFURLVolumeSupportsFileCloningKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume supports `clonefile(2)` (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

10.34.112 kCFURLVolumeSupportsHardLinksKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format supports hard links (Read-only, value type CFBooleanMBS)

10.34.113 kCFURLVolumeSupportsJournalingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format supports a journal used to speed recovery in case of unplanned restart (such as a power outage or crash). This does not necessarily mean the volume is actively using a journal. (Read-only, value type CFBooleanMBS)

10.34.114 kCFURLVolumeSupportsPersistentIDsKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format supports persistent object identifiers and can look up file system objects by their IDs (Read-only, value type CFBooleanMBS)

10.34.115 kCFURLVolumeSupportsRenamingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume can be renamed. (Read-only, value type CFBooleanMBS)

10.34.116 kCFURLVolumeSupportsRootDirectoryDatesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume supports reliable storage of times for the root directory. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or later.

10.34.117 kCFURLVolumeSupportsSparseFilesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format supports sparse files, that is, files which can have 'holes' that have never been written to, and thus do not consume space on disk. A sparse file may have an allocated size on disk that is less than its logical length. (Read-only, value type CFBooleanMBS)

10.34.118 kCFURLVolumeSupportsSwapRenamingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume supports `renamex_np(2)`'s `RENAME_SWAP` option (Read-only, value type `CFBooleanMBS`) for macOS 10.12 or later.

10.34.119 kCFURLVolumeSupportsSymbolicLinksKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume format supports symbolic links (Read-only, value type `CFBooleanMBS`)

10.34.120 kCFURLVolumeSupportsVolumeSizesKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: true if the volume supports returning volume size values (`kCFURLVolumeTotalCapacityKey` and `kCFURLVolumeAvailableCapacityKey`). (Read-only, value type `CFBooleanMBS`)

10.34.121 kCFURLVolumeSupportsZeroRunsKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: For security reasons, parts of a file (runs) that have never been written to must appear to contain zeroes. true if the volume keeps track of allocated but unwritten runs of a file so that it can substitute zeroes without actually writing zeroes to the media. (Read-only, value type `CFBooleanMBS`)

10.34.122 kCFURLVolumeTotalCapacityKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: Total volume capacity in bytes (Read-only, value type `CFNumberMBS`)

10.34.123 kCFURLVolumeURLForRemountingKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The CFURLMBS needed to remount a network volume, or nil if not available. (Read-only, value type CFURLMBS)

10.34.124 kCFURLVolumeURLKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: URL of the volume on which the resource is stored (Read-only, value type CFURLMBS)

10.34.125 kCFURLVolumeUUIDStringKey as CFStringMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: One of the resource keys.

Notes: The volume's persistent UUID as a string, or nil if a persistent UUID is not available for the volume. (Read-only, value type CFStringMBS)

10.34.126 Kind as CFStringMBS

Plugin Version: 2.9, Platform: macOS, Targets: All.

Function: Returns the kind string for the file.

10.34.127 LastPathComponent as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the LastPathComponent part of this URL.

10.34.128 Launch as Integer

Plugin Version: 2.9, Platform: macOS, Targets: All.

Function: Launches a file.

Notes: Returns a Mac OS error string or -1 if the function is not available.

10.34.129 NetLocation as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the NetLocation part of this URL.

10.34.130 ParameterString(charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the ParameterString part of this URL.

10.34.131 Password as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the Password part of this URL.

10.34.132 Path as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the Path part of this URL.

See also:

- 10.34.133 Path(resolveAgainstBase as boolean) as string

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10.34.133 Path(resolveAgainstBase as boolean) as string

Platform: macOS, Targets: All.

Function: Returns the path of this URL.

See also:

- 10.34.132 Path as CFStringMBS

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10.34.134 PathExtension as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the PathExtension part of this URL.

10.34.135 PortNumber as Integer

Platform: macOS, Targets: All.

Function: Returns the PortNumber part of this URL.

Notes: Returns -1 if no port specified and -2 on Windows and Mac OS Classic.

10.34.136 PosixFilePath as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the URL as PosixFilePath.

10.34.137 QueryString(charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the QueryString part of this URL.

10.34.138 ResourcePropertyForKey(key as CFStringMBS, byref value as Variant, byref error as CFErrorMBS) as boolean

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Returns the resource value identified by a given resource key.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim c as CFURLMBS = NewCFURLMBSFile(f)
```

```
dim v as Variant
dim e as CFErrorMBS
```

```
if c.ResourcePropertyForKey(c.kCFURLIsPackageKey, v1, e) then
dim p as CFBooleanMBS = v
```

```

MsgBox "IsPackage: "+str(p.Value)
else
MsgBox "Error: "+e.Description
end if

```

Notes: key: The resource key that identifies the resource property.
 Value: On output when the result is true, the resource value or nil.
 error: On output when the result is false, the error that occurred.

Returns true if value is successfully populated; false if an error occurs.

ResourcePropertyForKey first checks if the URL object already caches the resource value. If so, it returns the cached resource value to the caller. If not, then ResourcePropertyForKey synchronously obtains the resource value from the backing store, adds the resource value to the URL object's cache, and returns the resource value to the caller. The type of the resource value varies by resource property (see resource key definitions). If this function returns true and value is populated with nil, it means the resource property is not available for the specified resource and no errors occurred when determining the resource property was not available. If this function returns false, the optional error is populated. This function is currently applicable only to URLs for file system resources.

10.34.139 ResourceSpecifier as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the ResourceSpecifier part of this URL.

10.34.140 Scheme as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the scheme part of this URL.

10.34.141 SetResourcePropertyForKey(key as CFStringMBS, value as Variant, byref error as CFErrorMBS) as boolean

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Sets the resource value identified by a given resource key.

Example:

```

Dim f As FolderItem = SpecialFolder.Desktop.Child("test")
Dim c As CFURLMBS = NewCFURLMBSFile(f)

Dim e As CFErrorMBS

If c.SetResourcePropertyForKey(c.kCFURLIsPackageKey, NewCFBooleanMBS(true), e) Then
MsgBox "OK"
Else
MsgBox "Error: "+e.Description
End If

```

Notes: key: The resource key that identifies the resource property.

Value: The resource value.

error: On output when the result is false, the error that occurred.

Returns true if the attempt to set the resource value completed with no errors; otherwise, false.

CFURLSetResourcePropertyForKey writes the new resource value out to the backing store. Attempts to set a read-only resource property or to set a resource property not supported by the resource are ignored and are not considered errors. If this function returns false, the optional error is populated. This function is currently applicable only to URLs for file system resources.

10.34.142 Str as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the URL as binary data.

10.34.143 StrictPath as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the StrictPath part of this URL.

10.34.144 URLWithHandle(Handle as Integer) as CFURLMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: Creates a new URL object based on a handle value.

Notes: Will retain the reference.

10.34.145 Username as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the Username part of this URL.

10.34.146 WindowsFilePath as CFStringMBS

Platform: macOS, Targets: All.

Function: Returns the URL as WindowsFilePath.

10.34.147 Properties**10.34.148 AddedToDirectoryDate as CFDateMBS**

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: The date the resource was created, or renamed into or within its parent directory.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.AddedToDirectoryDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianCalendarMBS = d.AbsoluteTime.GregorianCalendar(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "AddedToDirectoryDate: " + y.SQLiteDateTime
```

Notes: Note that inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes.

(Read only property)

10.34.149 AttributeModificationDate as CFDateMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: The time the resource's attributes were last modified.

Example:

```

dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.AttributeModificationDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianCalendarMBS = d.AbsoluteTime.GregorianCalendar(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "AttributeModificationDate: " + y.SQLiteDateTime

```

Notes: (Read only property)

10.34.150 ContentAccessDate as CFDateMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: The date the resource was last accessed.

Example:

```

dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.ContentAccessDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianCalendarMBS = d.AbsoluteTime.GregorianCalendar(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "ContentAccessDate: " + y.SQLiteDateTime

```

Notes: (Read only property)

10.34.151 ContentModificationDate as CFDateMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: The time the resource content was last modified.

Example:

```

dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.ContentModificationDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianCalendarMBS = d.AbsoluteTime.GregorianCalendar(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "ContentModificationDate: " + y.SQLiteDateTime

```

Notes: (Read only property)

10.34.152 CreationDate as CFDateMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: The date the resource was created.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.CreationDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianCalendarMBS = d.AbsoluteTime.GregorianCalendar(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "CreationDate: " + y.SQLiteDateTime
```

Notes: (Read only property)

10.34.153 HasHiddenExtension as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for resources whose filename extension is removed from the localized name property.

Notes: (Read only property)

10.34.154 IsAlias as CFBooleanMBS

Plugin Version: 20.5, Platform: macOS, Targets: All.

Function: Whether this is an alias file.

Notes: true if the resource is a Finder alias file or a symlink, false otherwise.

(Read only property)

10.34.155 IsApplication as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True if resource is an application.

Notes: (Read only property)

10.34.156 IsDirectory as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for directories.

Notes: (Read only property)

10.34.157 IsHidden as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for resources normally not displayed to users.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox "IsHidden: "+str(u.IsHidden.Value)
```

Notes: If the resource is a hidden because its name starts with a period, setting this property to false will not change the property.

(Read only property)

10.34.158 IsPackage as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for packaged directories.

Notes: Note: You can only set or clear this property on directories; if you try to set this property on non-directory objects, the property is ignored. If the directory is a package for some other reason (extension type, etc), setting this property to false will have no effect.

(Read only property)

10.34.159 IsRegularFile as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for regular files.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox "IsRegularFile: "+str(u.IsRegularFile.Value)
```

Notes: (Read only property)

10.34.160 IsSymbolicLink as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for symlinks.

Notes: (Read only property)

10.34.161 IsSystemImmutable as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for system-immutable resources.

Notes: (Read only property)

10.34.162 IsUserImmutable as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for user-immutable resources.

Notes: (Read only property)

10.34.163 IsVolume as CFBooleanMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: True for the root directory of a volume.

Notes: (Read only property)

10.34.164 LocalizedName as CFStringMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: Localized or extension-hidden name as displayed to users.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox u.LocalizedName
```

Notes: (Read only property)

10.34.165 Name as CFStringMBS

Plugin Version: 16.4, Platform: macOS, Targets: All.

Function: The resource name provided by the file system.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox u.Name
```

Notes: (Read only property)

10.35 class CFUUIDMBS

10.35.1 class CFUUIDMBS

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: The Core Foundation class for an unique identifier.

Example:

```
dim u as new CFUUIDMBS
MsgBox u.StringValue
```

Notes: CFUUID objects are used by plug-ins to uniquely identify types, interfaces, and factories. When creating a new type, host developers must generate UUIDs to identify the type as well as its interfaces and factories.

UUIDs (Universally Unique Identifiers), also known as GUIDs (Globally Unique Identifiers) or IIDs (Interface Identifiers), are 128-bit values guaranteed to be unique. A UUID is made unique over both space and time by combining a value unique to the computer on which it was generated—usually the Ethernet hardware address—and a value representing the number of 100-nanosecond intervals since October 15, 1582 at 00:00:00.

The standard format for UUIDs represented in ASCII is a string punctuated by hyphens, for example 68753A44-4D6F-1226-9C60-0050E4C00067. The hex representation looks, as you might expect, like a list of numerical values preceded by &h. For example, &hD7, &h36, &h95, &h0A, &h4D, &h6E, &h12, &h26, &h80, &h3A, &h00, &h50, &hE4, &hC0, &h00, &h67 . To use a UUID, you simply create it and then copy the resulting strings into your header and C language source files. Because a UUID is expressed simply as an array of bytes, there are no endianness considerations for different platforms.

You can create a CFUUID object, and thereby generate a UUID, using any one of the Constructors. Subclass of the CFObjectMBS class.

Blog Entries

- [MBS REALbasic Plugins, version 10.5pr5](#)

10.35.2 Methods

10.35.3 Bytes as Memoryblock

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns the value of a UUID object as raw bytes.

Example:

```
// create new UUID
```

```

dim u as new CFUUIDMBS
// get raw data
dim m as MemoryBlock = u.Bytes
// display
MsgBox EncodingToHexMBS(m)+EndOfLine+u.StringValue

```

Notes: Returns the value of uuid represented as raw bytes.

10.35.4 Constructor

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Creates a Universally Unique Identifier (UUID) object.

Example:

```

dim u as new CFUUIDMBS
MsgBox u.StringValue

```

Notes: Returns a new CFUUID object or nil on any failure.
See also:

- 10.35.5 Constructor(Bytes as Memoryblock) 500
- 10.35.6 Constructor(uuidStr as string) 501

10.35.5 Constructor(Bytes as Memoryblock)

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Creates a CFUUID object from raw UUID bytes.

Example:

```

// create new UUID
dim u as new CFUUIDMBS
// get raw data

```

```

dim m as MemoryBlock = u.Bytes

// create new UUID with this bytes

dim v as new CFUUIDMBS(m)

// display UUIDs:

MsgBox u.StringValue+EndOfLine+v.StringValue

if u.Equal(v) then
MsgBox "equal"
else
MsgBox "not equal"
end if

```

Notes: bytes: Raw UUID bytes to use to create the CFUUID object.

Returns a new CFUUID object or nil on any error.
See also:

- 10.35.4 Constructor 500
- 10.35.6 Constructor(uuidStr as string) 501

10.35.6 Constructor(uuidStr as string)

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Creates a CFUUID object for a specified string.

Example:

```

// create new UUID

dim u as new CFUUIDMBS

// get string

dim s as string = u.StringValue

// create new UUID with this string

dim v as new CFUUIDMBS(s)

// display UUIDs:

```

```
MsgBox u.StringValue+EndOfLine+v.StringValue
```

```
if u.Equal(v) then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

Notes: uuidStr: A string containing a UUID. The standard format for UUIDs represented in ASCII is a string punctuated by hyphens, for example 68753A44-4D6F-1226-9C60-0050E4C00067.

Returns a new CFUUID object, or if a CFUUID object of the same value already exists, the existing instance with its reference count incremented. Returns nil on any error.

If you need to validate a GUID or UUID, please check the IsGUID function in our FAQ.
See also:

- 10.35.4 Constructor 500
- 10.35.5 Constructor(Bytes as Memoryblock) 500

10.35.7 StringValue as string

Plugin Version: 10.5, Platform: macOS, Targets: All.

Function: Returns the string representation of a specified CFUUID object.

Example:

```
dim u as new CFUUIDMBS
MsgBox u.StringValue
```

Chapter 11

CoreFoundation Network

11.1 class CFHostMBS

11.1.1 class CFHostMBS

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: A class for the CFHost API in CoreFoundation.

Notes: You can asynchronously resolve hostnames to IPs and back.

IPv6 compatible.

Subclass of the CFObjectMBS class.

Xojo Developer Magazine

- [3.6, page 6: News](#)

11.1.2 Methods

11.1.3 LookupAddress(address as string) as boolean

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Starts the asynchronous lookup process for the given address.

Notes: Address must be an IPv4 or IPv6 address.

Returns true on success or false on failure.

11.1.4 LookupName(hostname as CFStringMBS) as boolean

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Starts an asynchron lookup process to find the IP addresses for the given domain name.

Notes: Returns true on success and false on failure.

11.1.5 Events

11.1.6 Error(ErrorDomain as Integer, ErrorCode as Integer)

Plugin Version: 5.2, Platform: macOS, Targets: .

Function: An error occurred.

11.1.7 GotAddress(address as string, addressIndex as Integer, count as Integer)

Plugin Version: 5.2, Platform: macOS, Targets: .

Function: An IP address was found.

Notes: As plugins can't create arrays, the plugin will call this event count times with addressIndex going from 0 to count-1.

Name is the IP address, e.g. "12.34.56.78".

11.1.8 GotName(name as CFStringMBS, nameIndex as Integer, count as Integer)

Plugin Version: 5.2, Platform: macOS, Targets: .

Function: A name was found.

Notes: As plugins can't create arrays, the plugin will call this event count times with nameIndex going from 0 to count-1.

Name is the domain name, e.g. "apple.com".

11.2 class CFHTTPMessageMBS

11.2.1 class CFHTTPMessageMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a HTTP message.

Notes: Subclass of the CObjectMBS class.

11.2.2 Methods

11.2.3 AddAuthentication(authenticationFailureResponse as CFHTTPMessageMBS, username as CFStringMBS, password as CFStringMBS, authenticationScheme as CFStringMBS, forProxy as Boolean) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Adds authentication details.

Notes: Tries to modify request to contain the authentication information requested by authenticationFailureResponse (which presumably is a 401 or 407 response). Returns TRUE if successful; FALSE otherwise (leaving request unmodified). If authenticationScheme is NULL, the strongest supported scheme listed in failedResponse will be used.

11.2.4 AppendBytes(s as string) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Adds additional bytes to the message.

Notes: The following function appends the given bytes to the message given (parsing out any control information if appropriate).

Returns FALSE if a parsing error occurs while processing the new data.

11.2.5 Copy as CFHTTPMessageMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a copy of the HTTP message.

Notes: Returns nil on any error.

11.2.6 HeaderFields as CFDictionaryMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: All header fields in one big CFDictionary.

11.2.7 IsHeaderComplete as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Whether further header data is expected by the message.

11.2.8 IsRequest as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Whether the message is a response or a request.

11.2.9 kCFHTTPAuthenticationSchemeBasic as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A possible value you can pass when creating a HTTPMessage.

11.2.10 kCFHTTPAuthenticationSchemeDigest as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A possible value you can pass when creating a HTTPMessage.

11.2.11 kCFHTTPVersion1_0 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A possible value you can pass when creating a HTTPMessage.

11.2.12 kCFHTTPVersion1_1 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A possible value you can pass when creating a HTTPMessage.

11.2.13 RequestMethod as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The request method.

11.2.14 RequestURL as CFURLMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The request URL.

11.2.15 ResponseStatusCode as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The response status code.

Notes: See RFC 2616 for the codes.

11.2.16 ResponseStatusLine as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The response status line.

11.2.17 SerializedMessage as CFBinaryDataMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: This message with all data stored in one CFBinaryData object to store in e.g. a file.

11.2.18 Version as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The HTTP version of the message.

11.2.19 Properties

11.2.20 Body as CFBinaryDataMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The body of this message.

Notes: (Read and Write computed property)

11.2.21 HeaderField(headerfield as CFStringMBS) as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Set or Get one of the header fields of the Message.

Notes: (Read and Write computed property)

11.3 Globals

11.3.1 CFStreamCreatePairWithSocketMBS(TheSocket as CFSocketMBS, readstream as CFReadStreamMBS, writestream as CFWriteStreamMBS)

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates two streams based on one socket.

Notes: You need to pass in stream objects to get those objects filled.

If you forget one of this objects the stream will be readonly or writeonly.

11.3.2 CFStreamCreatePairWithSocketToHostMBS(host as CFStringMBS, port as Integer, readstream as CFReadStreamMBS, writestream as CFWriteStreamMBS)

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a pair of streams based on a socket which connects to the given host.

11.3.3 CFHTTPMessageCreateEmptyMBS(isRequest as boolean) as CFHTTPMessageMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new empty http message.

Notes: Returns nil on any error.

Creates an empty request or response, which you can then append bytes to via CFHTTPMessage.AppendBytes(). The HTTP header information will be parsed out as the bytes are appended.

11.3.4 CFHTTPMessageCreateRequestMBS(requestMethod as CFStringMBS, url as CFURLMBS, httpVersion as CFStringMBS) as CFHTTPMessageMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new HTTP message as a request.

11.3.5 CFHTTPMessageCreateResponseMBS(statusCode as Integer, statusDescription as CFStringMBS, httpVersion as CFStringMBS) as CFHTTPMessageMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new HTTP message as a response.

Notes: Pass nil to use the standard description for the given status code, as found in RFC 2616.

11.3.6 kCFHostMBSGetTypeID as Integer

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFHostMBS object.

11.3.7 kCFHTTPMessageMBSGetTypeID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFHTTPMessageMBS object.

11.3.8 kCFReadStreamMBSGetTypeID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFReadStreamMBS object.

11.3.9 kCFSocketMBSGetTypeID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFSocketMBS object.

11.3.10 kCFWriteStreamMBSGetTypeID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns the Type ID of a CFWriteStreamMBS object.

11.4 class CFProxyMBS

11.4.1 class CFProxyMBS

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: The class for proxy queries.

Notes: These APIs return arrays of dictionaries, where each dictionary describes a single proxy.

The arrays represent the order in which the proxies should be tried - try to download the URL using the first entry in the array, and if that fails, try using the second entry, and so on.

The keys to the proxy dictionaries follow the function declarations; every proxy dictionary will have an entry for `kCFProxyTypeKey`. If the type is anything except `kCFProxyTypeAutoConfigurationURL`, the dictionary will also have entries for the proxy's host and port (under `kCFProxyHostNameKey` and `kCFProxyPortNumberKey` respectively). If the type is `kCFProxyTypeAutoConfigurationURL`, it will have an entry for `kCFProxyAutoConfigurationURLKey`.

The keys for username and password are optional and will only be present if the username or password could be extracted from the information passed in (i.e. either the URL itself or the proxy dictionary supplied). These APIs do not consult any external credential stores (such as the Keychain).

All the class methods require Mac OS X 10.5 or newer.

Blog Entries

- [MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1](#)
- [MBS Xojo / Real Studio Plugins, version 14.1pr1](#)

11.4.2 Methods

11.4.3 `ExecuteProxyAutoConfigurationScript(proxyAutoConfigurationScript as string, targetURL as string) as boolean`

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Begins the process of executing `proxyAutoConfigurationScript` to determine the correct proxy to use to retrieve `targetURL`.

Notes: When the results are found, the event will be called on the main thread, passing a valid `proxyList` and `nil` error upon success, or a `nil` `proxyList` and valid error on failure.

`proxyAutoConfigurationScript`: A string containing the code of the script to be executed.

`targetURL`: The URL that should be passed to the autoconfiguration script.

Returns true if the request was started.

11.4.4 `ExecuteProxyAutoConfigurationURL(proxyAutoConfigURL as string, targetURL as string)` as boolean

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Executes the proxy auto configuration URL and returns which proxy to use.

Notes: As `ExecuteProxyAutoConfigurationScript()`, except that `ExecuteProxyAutoConfigurationURL` will additionally download the contents of `proxyAutoConfigURL`, convert it to a JavaScript string, and then execute that script.

11.4.5 `kCFNetworkProxiesExceptionsList` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the list of host name patterns that should bypass the proxy.

Notes: Value is an array of strings.

11.4.6 `kCFNetworkProxiesExcludeSimpleHostnames` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key whose value indicates if simple hostnames will be excluded

Notes: Value is a number.

Simple hostnames will be excluded if the key is present and has a non-zero value.

11.4.7 `kCFNetworkProxiesFTPEnable` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the enabled status of the ftp proxy.

Notes: Value is a number.

The proxy is enabled if the key is present and has a non-zero value.

11.4.8 `kCFNetworkProxiesFTPPassive` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the state of passive mode for the ftp proxy.

Notes: Value is a Number.

A value of one indicates that passive mode is enabled, a value of zero indicates that passive mode is not enabled.

11.4.9 kCFNetworkProxiesFTPPort as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the port number associated with the ftp proxy.

Notes: Value is a number which is the port number.

11.4.10 kCFNetworkProxiesFTPProxy as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the host name associated with the ftp proxy.

Notes: Value is a string which is the proxy host name.

11.4.11 kCFNetworkProxiesHTTPPort as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the port number associated with the HTTP proxy.

Notes: Value is a number which is the port number.

11.4.12 kCFNetworkProxiesHTTPProxy as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the host name associated with the HTTP proxy.

Notes: Value is a string which is the proxy host name.

11.4.13 kCFNetworkProxiesHTTPSEnable as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the enabled status of the HTTPS proxy; value is a number.

Notes: The proxy is enabled if the key is present and has a non-zero value.

11.4.14 `kCFNetworkProxiesHTTPSPort` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the port number associated with the HTTPS proxy.

Notes: Value is a Number which is the port number.

11.4.15 `kCFNetworkProxiesHTTPSProxy` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the host name associated with the HTTPS proxy.

Notes: Value is a string which is the proxy host name.

11.4.16 `kCFNetworkProxiesProxyAutoConfigEnable` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the enabled status ProxyAutoConfig (PAC).

Notes: Value is a number.

ProxyAutoConfig is enabled if the key is present and has a non-zero value.

11.4.17 `kCFNetworkProxiesProxyAutoConfigURLString` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the url which indicates the location of the ProxyAutoConfig (PAC) file.

Notes: Value is a string which is url for the PAC file.

11.4.18 `kCFNetworkProxiesProxyAutoDiscoveryEnable` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the enabled status of proxy auto discovery.

Notes: Value is a number.

Proxy auto discovery is enabled if the key is present and has a non-zero value.

11.4.19 `kCFNetworkProxiesRTSPEnable` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the enabled status of the RTSP proxy.

Notes: Value is a Number.

The proxy is enabled if the key is present and has a non-zero value.

11.4.20 kCFNetworkProxiesRTSPPort as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the port number associated with the RTSP proxy.

Notes: Value is a Number which is the port number.

11.4.21 kCFNetworkProxiesRTSPProxy as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the host name associated with the RTSP proxy.

Notes: Value is a string which is the proxy host name.

11.4.22 kCFNetworkProxiesSOCKSEnable as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the enabled status of the SOCKS proxy.

Notes: Value is a number.

The proxy is enabled if the key is present and has a non-zero value.

11.4.23 kCFNetworkProxiesSOCKSPort as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the port number associated with the SOCKS proxy.

Notes: Value is a Number which is the port number.

11.4.24 kCFNetworkProxiesSOCKSProxy as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the host name associated with the SOCKS proxy.

Notes: value is a String which is the proxy host name.

11.4.25 kCFProxyAutoConfigurationJavaScriptKey as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the proxy's PAC script.

Notes: The value is a String that contains the full JavaScript source text for the PAC file.

11.4.26 kCFProxyAutoConfigurationURLKey as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the proxy's PAC file location.

Notes: This key is only present if the proxy's type is kCFProxyTypeAutoConfigurationURL. Value is a string with URL specifying the location of a proxy auto-configuration file.

11.4.27 kCFProxyHostNameKey as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the proxy's hostname; value is a string.

Notes: Note that this may be an IPv4 or IPv6 dotted-IP string.

11.4.28 kCFProxyPasswordKey as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the password to be used with the proxy.

Notes: Value is a String. Note that this key will only be present if the username could be extracted from the information passed in. No external credential stores (like the Keychain) are consulted.

11.4.29 kCFProxyPortNumberKey as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the proxy's port number.

Notes: Value is a CFNumber specifying the port on which to contact the proxy.

11.4.30 kCFProxyTypeAutoConfigurationJavaScript as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: The proxy is specified by a proxy autoconfiguration (PAC) file content.

11.4.31 **kCFProxyTypeAutoConfigurationURL as string**

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: The proxy is specified by a proxy autoconfiguration (PAC) file.

11.4.32 **kCFProxyTypeFTP as string**

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: The proxy is an FTP proxy.

11.4.33 **kCFProxyTypeHTTP as string**

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: The proxy is an HTTP proxy.

11.4.34 **kCFProxyTypeHTTPS as string**

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: The proxy is a tunneling proxy as used for HTTPS.

11.4.35 **kCFProxyTypeKey as string**

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the type of proxy being represented.

Notes: value will be one of the `kCFProxyType*` constants listed below.

11.4.36 `kCFProxyTypeNone` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: No proxy should be used; contact the origin server directly.

11.4.37 `kCFProxyTypeSOCKS` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: One of the proxy types.

Notes: The proxy is a SOCKS proxy.

11.4.38 `kCFProxyUsernameKey` as string

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Key for the username to be used with the proxy.

Notes: Value is a String. Note that this key will only be present if the username could be extracted from the information passed in. No external credential stores (like the Keychain) are consulted.

11.4.39 `ProxiesForAutoConfigurationScript(proxyAutoConfigurationScript as string, URL as string, byref error as NSError) as Dictionary()`

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function:

Synchronously executes the given proxy autoconfiguration script and returns a valid proxyList and nil error upon success or a nil proxyList and valid error on failure.

Notes:

`proxyAutoConfigurationScript`: A string containing the code of the script to be executed.

`targetURL`: The URL that should be input in to the autoconfiguration script.

`error`: A return argument that will contain a valid error in case of failure.

Returns an array of dictionaries describing the proxies returned by the script or nil on failure.

11.4.40 ProxiesForURL(URL as string, proxySettings as Dictionary = nil) as Dictionary()

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Given a URL and a proxy dictionary, determines the ordered list of proxies that should be used to download the given URL.

Notes: url: The URL to be accessed

proxySettings: A dictionary describing the available proxy settings; the dictionary's format should match the dictionary returned by SystemProxySettings described below. If you pass nil, the plugin queries SystemProxySettings functions for you.

Returns an array of dictionaries; each dictionary describes a single proxy. See the comment at the top of this file for how to interpret the returned dictionaries.

11.4.41 SystemProxySettings as Dictionary

Plugin Version: 14.1, Platform: macOS, Targets: All.

Function: Returns a Dictionary containing the current system internet proxy settings.

Example:

```
dim d as Dictionary = CFProxyMBS.SystemProxySettings
```

```
dim k as string = CFProxyMBS.kCFProxyTypeKey
```

```
MsgBox "Type: "+d.lookup(k, "unknown")
```

Notes: Returns a dictionary containing key-value pairs that represent the current internet proxy settings. Value is nil if no proxy settings have been defined or if an error was encountered.

11.4.42 Events

11.4.43 AutoConfigurationResult(error as CFErrorMBS, proxyList() as Dictionary)

Plugin Version: 14.1, Platform: macOS, Targets: .

Function: Event to be called when a PAC file computation has completed.

Notes: Initiated by either ExecuteProxyAutoConfigurationScript or ExecuteProxyAutoConfigurationURL.

proxyList: Upon success, the list of proxies returned by the autoconfiguration script. The list has the same format as returned by ProxiesForURL, above, except that no entry may be of type kCFProxyTypeAutoCon-

figurationURL.

error: Upon failure, an error object explaining the failure.

11.5 class CFReadStreamMBS

11.5.1 class CFReadStreamMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a CoreFoundation write stream.

Notes: You can read from a file, a memoryblock or using a socket over the network. Subclass of the CFStreamMBS class.

11.5.2 Methods

11.5.3 close

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Closes the stream.

Notes: Terminates the flow of bytes; releases any system resources required by the stream. The stream may not fail to close.

11.5.4 CreateForHTTPRequest(request as CFHTTPMessageMBS) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new read stream based on the given HTTP request.

Notes: Creates a read stream for the response to the given request; when the stream is opened, it will begin transmitting the request. The bytes returned are the pure body bytes; the response header has been parsed off. To retrieve the response header, ask for kCFStreamPropertyHTTPResponseHeader any time after the first bytes arrive on the stream (or when stream end is reported, if there are no data bytes).

Returns true if successful.

11.5.5 CreateWithFile(fileurl as CFURLMBS) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new file based readstream.

Notes: Returns true if successful.

11.5.6 CreateWithMemoryBlock(mem as memoryblock, len as Integer) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new readstream based on the data of the given memoryblock.

Notes: Returns true if successful.

11.5.7 CreateWithString(s as string) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new readstream based on the data of the given string.

Notes: Returns true if successful.

11.5.8 ErrorCode as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The last error code.

Notes: Meaning depends on the ErrorDomain.

11.5.9 ErrorDomain as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The error domain of the last error code.

Notes: Possible domains:

kCFStreamErrorDomainCustom	= -1	custom to the kind of stream in question
kCFStreamErrorDomainPOSIX	= 1	POSIX errno; interpret using <sys/errno.h>
kCFStreamErrorDomainMacOSStatus	= 2	OSStatus type from Carbon APIs; interpret using <MacTypes.h>

11.5.10 GetProperty(propertyName as CFStringMBS) as CFObjectMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns a property of the stream.

Notes: Returns nil on any error.

Particular streams can name properties and assign meanings to them; you access these properties through the GetProperty and SetProperty calls. A property is any interesting information about the stream other than the data being transmitted itself. Examples include the headers from an HTTP transmission, or the

expected number of bytes, or permission information, etc. Properties that can be set configure the behavior of the stream, and may only be settable at particular times (like before the stream has been opened). See the documentation for particular properties to determine their get- and set-ability.

11.5.11 HasBytesAvailable as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: True if you can read bytes.

Notes: Whether there is data currently available for reading;
Returns TRUE if it's impossible to tell without trying.

11.5.12 InstallEvents

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Installs the event handler.

Notes: You need to remove the event handler later to not leak memory!
The event handler is needed to have the Callback event firing.

11.5.13 Open as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Opens the stream.

Notes: Returns success/failure. Opening a stream causes it to reserve all the system resources it requires. If the stream can open non-blocking, this will always return TRUE; listen to the Callback to find out when the open completes and whether it was successful, or poll using the Status property, waiting for a status of kCFStreamStatusOpen or kCFStreamStatusError.

11.5.14 ReadMemory(maxBytesToRead as Integer, mem as memoryblock) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Reads some bytes from the stream.

Notes: Returns the number of bytes read, or -1 if an error occurs preventing any bytes from being read, or 0 if the stream's end was encountered.

It is an error to try and read from a stream that hasn't been opened first.

This call will block until at least one byte is available; it will NOT block until the entire buffer can be filled.

To avoid blocking, either poll using `HasBytesAvailable` or use the run loop and listen for the `kCFStreamCanRead` event for notification of data available.

11.5.15 `ReadString(maxBytesToRead as Integer) as string`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Reads some bytes from the stream.

Notes: Returns a string as long as the number of bytes read, or "" if an error occurs preventing any bytes from being read or the stream's end was encountered.

It is an error to try and read from a stream that hasn't been opened first.

This call will block until at least one byte is available; it will NOT block until the entire buffer can be filled.

To avoid blocking, either poll using `HasBytesAvailable` or use the run loop and listen for the `kCFStreamCanRead` event for notification of data available.

11.5.16 `RemoveEvents`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Removes the event handler.

Notes: You should remove this event handler after you finished with the stream.

11.5.17 `SetProperty(propertyName as CFStringMBS, propertyValue as CFObjectMBS) as Boolean`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Sets a property of the stream.

Notes: Returns true if successful.

11.5.18 `Status as Integer`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The status of the stream.

Notes: Possible values:

kCFStreamStatusNotOpen	= 0
kCFStreamStatusOpening	= 1 (open is in-progress)
kCFStreamStatusOpen	= 2
kCFStreamStatusReading	= 3
kCFStreamStatusWriting	= 4
kCFStreamStatusAtEnd	= 5 (no further bytes can be read/written)
kCFStreamStatusClosed	= 6
kCFStreamStatusError	= 7

11.5.19 Events

11.5.20 Callback(reason as Integer)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: Called when something happens.

Notes: Possible values for the reason:

kCFStreamEventNone	= 0
kCFStreamEventOpenCompleted	= 1
kCFStreamEventHasBytesAvailable	= 2
kCFStreamEventCanAcceptBytes	= 4
kCFStreamEventErrorOccurred	= 8
kCFStreamEventEndEncountered	= 16

11.6 class CFSocketMBS

11.6.1 class CFSocketMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a CFSocket.

Notes: A CFSocket contains a native socket within a structure that can be used to read from the socket in the background and make the data thus read available using a runloop source.

Addresses are stored as CFData objects containing a struct sockaddr appropriate for the protocol family; make sure that all fields are filled in properly when passing in an address.

Some error codes:

```
kCFSocketSuccess    = 0
kCFSocketError      = -1
kCFSocketTimeout    = -2
```

Subclass of the CFObjectMBS class.

11.6.2 Methods

11.6.3 ConnectToAddress(address as CFBinaryDataMBS, timeout as Double) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Connects the socket to the given address.

Notes: Returns a socket error.

Some error codes:

```
kCFSocketSuccess    = 0
kCFSocketError      = -1
kCFSocketTimeout    = -2
```

11.6.4 Create as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new socket.

Notes: Some error codes:

```
kCFSocketSuccess    = 0,  
kCFSocketError      = -1,  
kCFSocketTimeout    = -2
```

11.6.5 Invalidate

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Invalidates the socket.

11.6.6 IsValid as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Checks if the socket is valid.

11.6.7 NativeSocketHandle as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The native socket handle.

11.6.8 PeerAddress as CFBinaryDataMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The peer address of this socket.

Notes: Returns nil on any error.

11.6.9 SendData(data as CFBinaryDataMBS, timeout as Double) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Sends data over the socket with a given timeout.

Notes: For convenience, a function is provided to send data using the socket with a timeout. The timeout will be used only if the specified value is positive.

Some error codes:

```
kCFSocketSuccess    = 0
kCFSocketError      = -1
kCFSocketTimeout    = -2
```

11.6.10 Properties

11.6.11 Address as CFBinaryDataMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The address of this socket.

Notes: (Read and Write computed property)

11.6.12 Events

11.6.13 Callback(reason as Integer, address as CFBinaryDataMBS, data as memoryblock)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: The callback event for this socket.

Notes: Possible reasons:

```
kCFSocketNoCallBack    = 0
kCFSocketReadCallBack  = 1
kCFSocketAcceptCallBack = 2
kCFSocketDataCallBack  = 3
kCFSocketConnectCallBack = 4
kCFSocketWriteCallBack = 8
```

11.7 class CFStreamMBS

11.7.1 class CFStreamMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a CFStream.

Notes: (Only a place to store all those constants ;-)

Subclass of the CFOBJECTMBS class.

11.7.2 Methods

11.7.3 kCFHTTPAuthenticationSchemeBasic as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the authentication schemes available.

11.7.4 kCFHTTPAuthenticationSchemeDigest as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the authentication schemes available.

11.7.5 kCFHTTPVersion1_0 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: HTTP Version 1.0.

11.7.6 kCFHTTPVersion1_1 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: HTTP Version 1.1.

11.7.7 kCFStreamErrorDomainHTTP as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: An error domain used with the socket based streams.

Notes: Possible error values:

```
kCFStreamErrorHTTPParseFailure    = -1
kCFStreamErrorHTTPRedirectionLoop = -2
kCFStreamErrorHTTPBadURL          = -3
```

11.7.8 kCFStreamErrorDomainSOCKS as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: SOCKS proxy error domain.

11.7.9 kCFStreamErrorDomainSSL as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: An error domain used with the socket based streams.

Notes: Secure stream support.

11.7.10 kCFStreamPropertyAppendToFile as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Whether to append new bytes to an existing file.

Notes: Property for file write streams; value should be a CFBoolean.

Set to TRUE to append to a file, rather than to replace its contents.

Requires Mac OS X 10.2

11.7.11 kCFStreamPropertyDataWritten as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A property name for use with the CFWriteStream class.

Example:

```
dim writestream as CFWriteStreamMBS
dim c as cobjectmbs
c=writestream.getproperty(writestream.kCFStreamPropertyDataWritten)
```

Notes: Value will be a CFData containing all bytes thusfar written; used to recover the data written to a memory write stream.

11.7.12 kCFStreamPropertyHTTPAttemptPersistentConnection as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value should be a CFBoolean. If this property is set to true, an HTTP stream will look for an appropriate extant persistent connection to use, and if it finds none, will try to create one.

11.7.13 kCFStreamPropertyHTTPFinalURL as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value is the CFURL from the final request; will only differ from the URL in the original request if an autoredirection has occurred.

11.7.14 kCFStreamPropertyHTTPProxy as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Which HTTP Proxy to use.

Notes: HTTP proxy information is set the same way as SOCKS proxies.

Call CFReadStream.SetProperty() passing an HTTP stream and the property kCFStreamPropertyHTTPProxy.

The value should be a CFDictionary that includes at least one Host/Port pair from the keys below.

The dictionary returned by SystemConfiguration.framework can also be passed directly as the value

Keys for the dictionary to use:

kCFStreamPropertyHTTPProxyHost

kCFStreamPropertyHTTPProxyPort

kCFStreamPropertyHTTPSPProxyHost

kCFStreamPropertyHTTPSPProxyPort

11.7.15 kCFStreamPropertyHTTPProxyHost as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the keys for the proxy CFDictionary for a socket based stream.

11.7.16 kCFStreamPropertyHTTPProxyPort as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the keys for the proxy CFDictionary for a socket based stream.

11.7.17 kCFStreamPropertyHTTPResponseHeader as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value is a CFHTTPMessage with 0 bytes data.

11.7.18 kCFStreamPropertyHTTPShouldAutoredirect as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value should be a CFBoolean.

11.7.19 kCFStreamPropertyHTTPSPProxyHost as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the keys for the proxy CFDictionary for a socket based stream.

11.7.20 kCFStreamPropertyHTTPSPProxyPort as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the keys for the proxy CFDictionary for a socket based stream.

11.7.21 kCFStreamPropertyShouldCloseNativeSocket as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Set the value to `kCFBooleanTrue` if the stream should close and release the underlying native socket when the stream is released. Set the value to `kCFBooleanFalse` to keep the native socket from closing and releasing when the stream is released.

If the stream was created with a native socket, the default property setting on the stream is `kCFBooleanFalse`.

The `kCFStreamPropertyShouldCloseNativeSocket` can be set through `CFReadStream.SetProperty` or `CFWriteStream.SetProperty`. The property can be copied through `CFReadStream.GetProperty` or `CFWriteStream.GetProperty`.

11.7.22 `kCFStreamPropertySocketNativeHandle` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value will be a `CFData` containing the native handle.

11.7.23 `kCFStreamPropertySocketRemoteHostName` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value will be a `CFString`, or `nil` if unknown.

11.7.24 `kCFStreamPropertySocketRemotePortNumber` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: Value will be a `CFNumber`, or `nil` if unknown.

11.7.25 `kCFStreamPropertySocketSecurityLevel` as `CFStringMBS`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: You set this property to one of the following values:

`kCFStreamSocketSecurityLevelSSLv3`

`kCFStreamSocketSecurityLevelSSLv2`

`kCFStreamSocketSecurityLevelNone`

kCFStreamSocketSecurityLevelNegotiatedSSL

kCFStreamSocketSecurityLevelTLSv1

(this 5 properties return CFStrings which you pass to SetProperty)

11.7.26 kCFStreamPropertySOCKSPassword as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

11.7.27 kCFStreamPropertySOCKSProxy as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

Notes: SOCKS Proxy usage

To set a stream to use a SOCKS proxy, call `CFReadStream.SetProperty` or `CFWriteStream.SetProperty` with the property name set to `kCFStreamPropertySOCKSProxy` and the value being a `CFDictionary` with at least the following two keys: `kCFStreamPropertySOCKSProxyHost` and `kCFStreamPropertySOCKSProxyPort`. The dictionary returned by `SystemConfiguration` for SOCKS proxies will work without alteration.

The key `kCFStreamPropertySOCKSProxyHost` should contain a `CFStringRef` value representing the SOCKS proxy host. The key `kCFStreamPropertySOCKSProxyPort` should contain a `CFNumberRef` which itself is of type `kCFNumberSInt32Type`. This value should represent the port on which the proxy is listening.

By default, SOCKS5 will be used unless there is a `kCFStreamPropertySOCKSVersion` key in the `CFDictionary`. Its value must be `kCFStreamSocketSOCKSVersion4` or `kCFStreamSocketSOCKSVersion5` to set SOCKS4 or SOCKS5, respectively.

To set a user name and/or password, if required, the dictionary must contain the key(s) `kCFStreamPropertySOCKSUser` and/or `kCFStreamPropertySOCKSPassword` with the value being the user's name as a `CFString` and/or the user's password as a `CFString`, respectively.

`kCFStreamPropertySOCKSProxy` can be set through `CFReadStream.SetProperty` or `CFWriteStream.SetProperty`. The property can be copied through `CFReadStream.GetProperty` or `CFWriteStream.GetProperty`.

11.7.28 kCFStreamPropertySOCKSProxyHost as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

11.7.29 kCFStreamPropertySOCKSProxyPort as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

11.7.30 kCFStreamPropertySOCKSUser as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

11.7.31 kCFStreamPropertySOCKSVersion as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property keys for a socket based stream.

11.7.32 kCFStreamSocketSecurityLevelNegotiatedSSL as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property values for a socket based stream.

Notes: TLS or SSL with fallback to lower versions; this is what HTTPS does, for instance.

11.7.33 kCFStreamSocketSecurityLevelNone as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property values for a socket based stream.

11.7.34 kCFStreamSocketSecurityLevelSSLv2 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property values for a socket based stream.

11.7.35 kCFStreamSocketSecurityLevelSSLv3 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property values for a socket based stream.

11.7.36 kCFStreamSocketSecurityLevelTLSv1 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the property values for a socket based stream.

11.7.37 kCFStreamSocketSOCKSVersion4 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the values used with the kCFStreamPropertySOCKSVersion property for a socket based stream.

11.7.38 kCFStreamSocketSOCKSVersion5 as CFStringMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the values used with the kCFStreamPropertySOCKSVersion property for a socket based stream.

11.8 class CFWriteStreamMBS

11.8.1 class CFWriteStreamMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a CoreFoundation write stream.

Notes: You can write to a file, a memoryblock or using a socket over the network.
Subclass of the CFStreamMBS class.

11.8.2 Methods

11.8.3 CanAcceptBytes as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Whether the stream can now accept data to write.

Notes: Whether the stream can currently be written to without blocking;
Returns TRUE if it's impossible to tell without trying.

11.8.4 close

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Closes the stream.

Notes: Terminates the flow of bytes; releases any system resources required by the stream. The stream may not fail to close.

11.8.5 CreateWithFile(fileurl as CFURLMBS) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new WriteStream using the given file specification.

Notes: Returns true if successful.

11.8.6 CreateWithMemory as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new memory based stream.

Notes: New buffers are allocated as bytes are written to the stream. At any point, you can recover the

bytes thusfar written by asking for the property `kCFStreamPropertyDataWritten` (using `GetProperty`).

11.8.7 `CreateWithMemoryBlock(mem as memoryblock, len as Integer)` as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new `WriteStream` which writes the data into the given `memoryblock`.

Notes: The stream writes into the `memoryblock` given; when `bufferCapacity` is exhausted, the stream is exhausted (status becomes `kCFStreamStatusAtEnd`).

Returns `nil` on any error.

11.8.8 `ErrorCode` as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The last error code.

Notes: Meaning depends on the `ErrorDomain`.

11.8.9 `ErrorDomain` as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The error domain of the last error code.

Notes: Possible domains:

<code>kCFStreamErrorDomainCustom</code>	= -1	custom to the kind of stream in question
<code>kCFStreamErrorDomainPOSIX</code>	= 1	POSIX <code>errno</code> ; interpret using <code><sys/errno.h></code>
<code>kCFStreamErrorDomainMacOSStatus</code>	= 2	OSStatus type from Carbon APIs; interpret using <code><MacTypes.h></code>

11.8.10 `GetProperty(propertyName as CFStringMBS)` as `CFOBJECTMBS`

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns a property of the stream.

Notes: Returns `nil` on any error.

Particular streams can name properties and assign meanings to them; you access these properties through the `GetProperty` and `SetProperty` calls. A property is any interesting information about the stream other than the data being transmitted itself. Examples include the headers from an HTTP transmission, or the expected number of bytes, or permission information, etc. Properties that can be set configure the behavior of the stream, and may only be settable at particular times (like before the stream has been opened). See

the documentation for particular properties to determine their get- and set-ability.

11.8.11 InstallEvents

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Installs the event handler.

Notes: You need to remove the event handler later to not leak memory!
The event handler is needed to have the Callback event firing.

11.8.12 Open as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Opens the stream.

Notes: Returns success/failure. Opening a stream causes it to reserve all the system resources it requires. If the stream can open non-blocking, this will always return TRUE; listen to the Callback to find out when the open completes and whether it was successful, or poll using the Status property, waiting for a status of kCFStreamStatusOpen or kCFStreamStatusError.

11.8.13 RemoveEvents

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Removes the event handler.

Notes: You should remove this event handler after you finished with the stream.

11.8.14 SetProperty(propertyName as CFStringMBS, propertyValue as CFObjectMBS) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Sets a property of the stream.

Notes: Returns true if successfull.

11.8.15 Status as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The status of the stream.

Notes: Possible values:

```

kCFStreamStatusNotOpen    = 0
kCFStreamStatusOpening    = 1 (open is in-progress)
kCFStreamStatusOpen       = 2
kCFStreamStatusReading    = 3
kCFStreamStatusWriting    = 4
kCFStreamStatusAtEnd      = 5 (no further bytes can be read/written)
kCFStreamStatusClosed     = 6
kCFStreamStatusError      = 7

```

11.8.16 WriteMemory(mem as memoryblock, len as Integer) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Write the data from inside the memoryblock to the stream.

Notes: Returns the number of bytes successfully written, -1 if an error has occurred, or 0 if the stream has been filled to capacity (for fixed-length streams). If the stream is not full, this call will block until at least one byte is written. To avoid blocking, either poll via `CanAcceptBytes` or use the run loop and listen for the `kCFStreamCanWrite` event.

11.8.17 WriteString(buf as string) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Write the data from inside the string to the stream.

Notes: Returns the number of bytes successfully written, -1 if an error has occurred, or 0 if the stream has been filled to capacity (for fixed-length streams). If the stream is not full, this call will block until at least one byte is written. To avoid blocking, either poll via `CanAcceptBytes` or use the run loop and listen for the `kCFStreamCanWrite` event.

11.8.18 Events

11.8.19 Callback(reason as Integer)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: Called when something happens.

Notes: Possible values for the reason:

kCFStreamEventNone	= 0
kCFStreamEventOpenCompleted	= 1
kCFStreamEventHasBytesAvailable	= 2
kCFStreamEventCanAcceptBytes	= 4
kCFStreamEventErrorOccurred	= 8
kCFStreamEventEndEncountered	= 16

Chapter 12

CoreGraphics Events

12.1 class CGEventMBS

12.1.1 class CGEventMBS

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The class for a CoreGraphics event.

Notes: Subclass of the CXObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 17.4pr5](#)

12.1.2 Methods

12.1.3 available as boolean

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Whether this class is available.

Notes: Returns true on macOS 10.4 or newer.

12.1.4 Constructor(Handle as Integer)

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The constructor taking a CGEventRef value.

Notes: The object is retained and should not be zero.

12.1.5 Copy as CGEventMBS

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Return a copy of event.

12.1.6 Properties

12.1.7 EventSource as CGEventSourceMBS

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The event source.

Notes: (Read and Write property)

12.1.8 Flags as Integer

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The event flags of an event.

Notes: (Read and Write property)

12.1.9 Timestamp as UInt64

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The timestamp of an event.

Notes: (Read and Write property)

12.1.10 Type as Integer

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The event type of an event (left mouse down, for example).

Notes: See constants like `kCGMouseButtonLeft`.
(Read and Write property)

12.1.11 UnicodeString as String

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The Unicode string associated with a keyboard event.

Notes: By default, the system translates the virtual key code in a keyboard event into a Unicode string based on the keyboard ID in the event source. This function allows you to manually override this string. Note that application frameworks may ignore the Unicode string in a keyboard event and do their own translation based on the virtual keycode and perceived event state.

(Read and Write property)

12.1.12 UnicodeStringLength as Integer

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Return the length of the unicode string associated with a keyboard event.

Notes: (Read only property)

12.1.13 DoubleValueField(field as Integer) as Double

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The floating-point value of a field in an event.

Notes: Before setting a value, the event type must be set using a typed event creation function such as `CGEventCreateMouseEvent`, or by setting type property.

If you are creating a mouse event generated by a tablet, call this function and specify the field `kCGMouseEventSubtype` with a value of `kCGEventMouseEventSubtypeTabletPoint` or `kCGEventMouseEventSubtypeTabletProximity` before setting other parameters.

(Read and Write computed property)

12.1.14 IntegerValueField(field as Integer) as Int64

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The integer value of a field in an event.

Notes: Before calling this function, the event type must be set using a typed event creation function such as `CGEventCreateMouseEvent`, or by setting type property.

In cases where the field value is represented within the event by a fixed point number or an integer, the result is scaled to the appropriate range as part of creating the floating-point representation.

(Read and Write computed property)

12.1.15 Constants

Event Types

Constant	Value	Description
kCGEventFlagsChanged	12	Key flags changed, e.g. modifier keys pressed.
kCGEventKeyDown	10	Key Down
kCGEventKeyUp	11	Key up.
kCGEventLeftMouseDown	1	left mouse-down event
kCGEventLeftMouseDragged	6	left mouse-dragged event
kCGEventLeftMouseUp	2	left mouse-up event
kCGEventMouseMoved	5	mouse-moved event
kCGEventNull	0	The null event. (not defined)
kCGEventOtherMouseDown	25	other mouse-down event
kCGEventOtherMouseDragged	27	other mouse-dragged event
kCGEventOtherMouseUp	26	other mouse-up event
kCGEventRightMouseDown	3	right mouse-down event
kCGEventRightMouseDragged	7	right mouse-dragged event
kCGEventRightMouseUp	4	right mouse-up event
kCGEventScrollWheel	22	Scroll Wheel event.
kCGEventTabletPointer	23	Tablet pointer event.
kCGEventTabletProximity	24	Tablet Proximity event.
kCGEventTapDisabledByTimeout	&hFFFFFFFE	Out of band event types. These are delivered to the event tap callback of unusual conditions that disable the event tap.
kCGEventTapDisabledByUserInput	&hFFFFFFF	Out of band event types. These are delivered to the event tap callback of unusual conditions that disable the event tap.

Mouse Buttons

Constant	Value	Description
kCGMouseButtonCenter	2	Center
kCGMouseButtonLeft	0	Left
kCGMouseButtonRight	1	Right

Scroll Event Units

Constant	Value	Description
kCGScrollEventUnitLine	1	Line
kCGScrollEventUnitPixel	0	Pixel

12.2 class CGEventSourceMBS

12.2.1 class CGEventSourceMBS

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The class for CGEventSource class.

Notes: Subclass of the CXObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 18.5pr8](#)

12.2.2 Methods

12.2.3 Constructor(Handle as Integer)

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The constructor taking a CGEventSourceRef value.

Notes: The object is retained and should not be zero.

12.2.4 Properties

12.2.5 KeyboardType as Integer

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The keyboard type.

Notes: e.g. 198 for Touchbar or 59 for Macbook Pro keyboard.
(Read only property)

12.2.6 UserData as Int64

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: Custom user data to associate with event source.

Notes: (Read and Write property)

12.3 class CGEventTapMBS

12.3.1 class CGEventTapMBS

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The class for a Event taps.

Notes: Taps may be placed at the point where HIDSystem events enter the server, at the point where HIDSystem and remote control events enter a session, at the point where events have been annotated to flow to a specific application, or at the point where events are delivered to the application. Taps may be inserted at a specified point at the head of pre-existing filters, or appended after any pre-existing filters.

Taps may be passive event listeners, or active filters. An active filter may pass an event through unmodified, modify an event, or discard an event. When a tap is registered, it identifies the set of events to be observed with a mask, and indicates if it is a passive or active event filter. Multiple event type bitmasks may be ORed together.

Taps may only be placed at kCGHIDEEventTap by a process running as the root user. An exception is raised for other users.

Taps placed at kCGHIDEEventTap, kCGSessionEventTap, kCGAnnotatedSessionEventTap, or on a specific process may only receive key up and down events if access for assistive devices is enabled (Preferences Accessibility panel, Keyboard view) or the caller is enabled for assistive device access, as by AXMakeProcessTrusted. If the tap is not permitted to monitor these events when the tap is created, then the appropriate bits in the mask are cleared. If that results in an empty mask, then an exception is raised.

For MacOS 10.15 using CGEventTap to track other applications may result in a dialog asking for permissions. This may not happen if you track your own process' events.

Blog Entries

- [MBS Xojo Plugins, version 19.4pr3](#)
- [MBS Xojo Plugins, version 17.4pr5](#)

12.3.2 Methods

12.3.3 available as boolean

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Whether this class is available.

Notes: Returns true for macOS 10.4 or newer.

12.3.4 Constructor(tapLocation as Integer, Place as Integer, Options as Integer, EventMask as Integer, PID as Integer = -1)

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Creates an event tap.

Notes: If you pass PID >0, we will create an event tap for a specified process. tapLocation is then ignored. PID parameter added for plugin version 19.4.

12.3.5 Properties

12.3.6 Enabled as Boolean

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Whether this tap is enabled.

Notes: (Read and Write property)

12.3.7 Events

12.3.8 GotEvent(Proxy as Ptr, type as Integer, e as CGEventMBS) as CGEventMBS

Plugin Version: 17.4, Platform: macOS, Targets: .

Function: The event called when you can process an event.

Notes: For an active tap, please return the event back.

12.3.9 Constants

Constants

Constant	Value	Description
kCGEventTapOptionDefault	0	One of the constants that specify whether a new event tap is an active filter or a passive listener. Default, active filter.
kCGEventTapOptionListenOnly	1	One of the constants that specify whether a new event tap is an active filter or a passive listener. Listen only.
kCGHeadInsertEventTap	0	One of the constants that specify where a new event tap is inserted into the list of active event taps. Insert in front.
kCGTailAppendEventTap	1	One of the constants that specify where a new event tap is inserted into the list of active event taps. Append to the tail.

Tapping Points

Constant	Value	Description
kCGAnnotatedSessionEventTap	2	At the point where events have been annotated to flow to a specific application, or at the point where events are delivered to the application.
kCGHIDEEventTap	0	When HIDSystem events enter the server.
kCGSessionEventTap	1	At the point where HIDSystem and remote control events enter a session.

Event Masks

Constant	Value	Description
kCGEventMaskFlagsChanged	4096	Key flags changed, e.g. modifier keys pressed.
kCGEventMaskForAllEvents	-1	Listen for all events.
kCGEventMaskKeyDown	1024	Key Down
kCGEventMaskKeyUp	2048	Key up.
kCGEventMaskLeftMouseDown	2	left mouse-down event
kCGEventMaskLeftMouseDragged	64	left mouse-dragged event
kCGEventMaskLeftMouseUp	4	left mouse-up event
kCGEventMaskMouseMove	32	mouse-moved event
kCGEventMaskOtherMouseDown	&h2000000	other mouse-down event
kCGEventMaskOtherMouseDragged	&h8000000	other mouse-dragged event
kCGEventMaskOtherMouseUp	&h4000000	other mouse-up event
kCGEventMaskRightMouseDown	8	right mouse-down event
kCGEventMaskRightMouseDragged	128	right mouse-dragged event
kCGEventMaskRightMouseUp	16	right mouse-up event
kCGEventMaskScrollWheel	&h400000	Scroll Wheel event.
kCGEventMaskTabletPointer	&h800000	Tablet pointer event.
kCGEventMaskTabletProximity	&h1000000	Tablet Proximity event.

Chapter 13

Files

13.1 class DarwinChmodMBS

13.1.1 class DarwinChmodMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: A class to change the owner or mode of a file on Mac OS X.

Example:

```
dim c as DarwinChmodMBS
dim userfolder as FolderItem
dim darwinResult as Integer
dim s as string

c=new DarwinChmodMBS

userFolder=SpecialFolder.Desktop.Child("chmod.rb")
s=userFolder.NativePath

darwinResult = c.chmod( s, &B111111111 ) // all rwx

// 1 = ——x
// 2 = ——wx
// 7 = ——rwx
// 8 = ——x—

darwinResult=c.lstat(s)

MsgBox s+" "+str(darwinResult)+" "+str(c.error)
```

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 14.0pr1](#)
- [MBS Real Studio Plugins, version 12.4pr10](#)

13.1.2 Methods**13.1.3 chflags(path as string, flags as Integer) as Integer**

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The file whose name is given by path has its flags changed to flags.

Notes: The flags specified are formed by or'ing the following values

UF_NODUMP	0x00000001	Do not dump the file.
UF_IMMUTABLE	0x00000002	The file may not be changed.
UF_APPEND	0x00000004	The file may only be appended to.
UF_OPAQUE	0x00000008	Directory is opaque wrt. union

The "UF_IMMUTABLE" and "UF_APPEND" flags may be set or unset by either the owner of a file or the super-user.

The "SF_IMMUTABLE" and "SF_APPEND" flags may only be set or unset by the super-user. They may be set at any time, but normally may only be unset when the system is in single-user mode.

You can type "man 2 chflags" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned. Returns -2 on bad parameter or if function is not available.

Chflags() will fail if:

13.1.4 chmod(path as string, mode as Integer) as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Sets the file permission bits of the file specified by the pathname path to mode.

Example:

```
dim f as FolderItem
dim g as FolderItem
```

ENOTDIR	A component of the path prefix is not a directory.
ENAMETOOLONG	A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters.
ENOENT	The named file does not exist.
EACCES	Search permission is denied for a component of the path prefix.
ELOOP	Too many symbolic links were encountered in translating the pathname.
EPERM	The effective user ID does not match the owner of the file and the effective user ID is not the super-user.
EROFS	The named file resides on a read-only file system.
EFAULT	Path points outside the process's allocated address space.
EIO	An I/O error occurred while reading from or writing to the file system.

```
f=SpecialFolder.Desktop.Child("test1")
g=SpecialFolder.Desktop.Child("test2")
```

```
dim d as DarwinChmodMBS
```

```
d=new DarwinChmodMBS
```

```
if d.stat(f.NativePath)=0 then // read mode
if d.chmod(g.NativePath,d.mode)=0 then // set mode
// worked
end if
end if
```

Notes: Chmod() verifies that the process owner (user) either owns the file specified by path (or fd), or is the super- user. A mode is created from or'd permission bit masks like this:

The ISVTX (the sticky bit) indicates to the system which executable files are shareable (the default) and the system maintains the program text of the files in the swap area. The sticky bit may only be set by the super user on shareable executable files.

If mode ISVTX (the 'sticky bit') is set on a directory, an unprivileged user may not delete or rename files of other users in that directory. The sticky bit may be set by any user on a directory which the user owns or has appropriate permissions. For more details of the properties of the sticky bit, see sticky(8).

Writing or changing the owner of a file turns off the set-user-id and set-group-id bits unless the user is the super-user. This makes the system somewhat more secure by protecting set-user-id (set-group-id) files from remaining set-user-id (set-group-id) if they are modified, at the expense of a degree of compatibility.

You can type "man 2 chmod" on the Mac OS X terminal for more details.

IRWXU	&o0000700	RWX mask for owner
IRUSR	&o0000400	R for owner
IWUSR	&o0000200	W for owner
IXUSR	&o0000100	X for owner
IRWXG	&o0000070	RWX mask for group
IRGRP	&o0000040	R for group
IWGRP	&o0000020	W for group
IXGRP	&o0000010	X for group
IRWXO	&o0000007	RWX mask for other
IROTH	&o0000004	R for other
IWOTH	&o0000002	W for other
IXOTH	&o0000001	X for other
ISUID	&o0004000	set user id on execution
ISGID	&o0002000	set group id on execution
ISVTX	&o0001000	save swapped text even after use

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned.
Returns -2 on bad parameter or if function is not available.

Chmod() will fail and the file mode will be unchanged if:

ENOTDIR	A component of the path prefix is not a directory.
ENAMETOOLONG	A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters.
ENOENT	The named file does not exist.
EACCES	Search permission is denied for a component of the path prefix.
ELOOP	Too many symbolic links were encountered in translating the pathname.
EPERM	The effective user ID does not match the owner of the file and the effective user ID is not the super-user.
EROFS	The named file resides on a read-only file system.
EFAULT	Path points outside the process's allocated address space.
EIO	An I/O error occurred while reading from or writing to the file system.

13.1.5 chown(path as string, uid as Integer, gid as Integer) as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The owner ID and group ID of the file (or link) named by path is changed as specified by the arguments owner (uid) and group (gid).

Notes: The owner of a file may change the group to a group of which he or she is a member, but the change owner capability is restricted to the superuser.

Chown() clears the set-user-id and set-group-id bits on the file to prevent accidental or mischievous creation of set-user-id and set-group-id programs.

You can type "man 2 chmod" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned.
Returns -2 on bad parameter or if function is not available.

Chown() will fail and the file or link will be unchanged if:

ENOTDIR	A component of the path prefix is not a directory.
ENAMETOOLONG	A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters.
ENOENT	The named file does not exist.
EACCES	Search permission is denied for a component of the path prefix.
ELOOP	Too many symbolic links were encountered in translating the pathname.
EPERM	The effective user ID is not the super-user.
EROFS	The named file resides on a read-only file system.
EFAULT	Path points outside the process's addressspace.
EIO	An I/O error occurred while reading from or writing to the file system.

13.1.6 error as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the error code from the last operation.

Notes: This function asks the operation system. It's not a property like in other classes.

Error codes:

Returns -2 if function is not available.

13.1.7 lstat(path as string) as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The stat function obtains information about the file pointed to by path.

Example:

```
// we use truechild to not resolve the symbol link
dim f as FolderItem = SpecialFolder.Desktop.trueChild("test.rtf")

dim c as new DarwinChmodMBS
if c.lstat(f.NativePath) = 0 then
// ok

Break // see values in debugger
else
MsgBox "failed"
end if
```

Notes: See stat for details.

13.1.8 stat(path as string) as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The stat function obtains information about the file pointed to by path.

Example:

```
dim d as DarwinChmodMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test")
d=new DarwinChmodMBS

if d.stat(f.NativePath)=0 then
MsgBox hex(d.mode)
end if
```

Notes: Read, write or execute permission of the named file is not required, but all directories listed in the path name leading to the file must be searchable.

Lstat() is like stat() except in the case where the named file is a symbolic link, in which case lstat() returns information about the link, while stat() returns information about the file the link references. Unlike other filesystem objects, symbolic links do not have an owner, group, access mode, times, etc. Instead, these attributes are taken from the directory that contains the link. The only attributes returned from an lstat() that refer to the symbolic link itself are the file type (S_IFLNK), size, blocks, and link count (always 1).

Information about the file is stored directly into the fields of the class if the function is successful.

You can type "man 2 stat" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned. Returns -2 on bad parameter or if function is not available.

Stat() and lstat() will fail if:

13.1.9 Properties

13.1.10 blocks as Double

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Number of blocks allocated for the file.

Notes: The actual number of blocks allocated for the file in 512-byte units. As short symbolic links are stored in the inode, this number may be zero.

Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.11 blocksize as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The optimal I/O block size for the file.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.12 dev as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The device inode where the file resides on.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.13 flags as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: User defined flags for the file.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.14 gen as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The file generation number.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.15 gid as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The group-id of the owner of the file.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.16 ino as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The inode's number of the file.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.17 mode as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The inode protection mode of the file.

Notes: Set by the stat and lstat function if it was successful.

Some Constants:

(Read and Write property)

13.1.18 nlink as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The number of hard links to the file.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.19 rdev as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The device type, for special file inode.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.20 size as Double

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The file size, in bytes.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

13.1.21 uid as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The user-id of the owner of the file.

Notes: Set by the stat and lstat function if it was successful.
(Read and Write property)

EPERM	1	Operation not permitted
ENOENT	2	No such file or directory
ESRCH	3	No such process
EINTR	4	Interrupted system call
EIO	5	Input/output error
ENXIO	6	Device not configured
E2BIG	7	Argument list too long
ENOEXEC	8	Exec format error
EBADF	9	Bad file descriptor
ECHILD	10	No child processes
EDEADLK	11	Resource deadlock avoided (11 was EAGAIN)
ENOMEM	12	Cannot allocate memory
EACCESS	13	Permission denied
EFAULT	14	Bad address
ENOTBLK	15	Block device required
EBUSY	16	Device busy
EEXIST	17	File exists
EXDEV	18	Cross-device link
ENODEV	19	Operation not supported by device
ENOTDIR	20	Not a directory
EISDIR	21	Is a directory
EINVAL	22	Invalid argument
ENFILE	23	Too many open files in system
EMFILE	24	Too many open files
ENOTTY	25	Inappropriate ioctl for device
ETXTBSY	26	Text file busy
EFBIG	27	File too large
ENOSPC	28	No space left on device
ESPIPE	29	Illegal seek
EROFS	30	Read-only file system
EMLINK	31	Too many links
EPIPE	32	Broken pipe
math software		
EDOM	33	Numerical argument out of domain
ERANGE	34	Result too large
non-blocking and interrupt i/o		
EAGAIN	35	Resource temporarily unavailable
EWouldBLOCK	EAGAIN	Operation would block
EINPROGRESS	36	Operation now in progress
EALREADY	37	Operation already in progress
ipc/network software – argument errors		
ENOTSOCK	38	Socket operation on non-socket
EDESTADDRREQ	39	Destination address required
EMSGSIZE	40	Message too long
EPROTOTYPE	41	Protocol wrong type for socket
ENOPROTOPT	42	Protocol not available
EPROTONOSUPPORT	43	Protocol not supported
ESOCKTNOSUPPORT	44	Socket type not supported
ENOTSUP	45	Operation not supported
EOPNOTSUPP	ENOTSUP	Operation not supported
EPFNOSUPPORT	46	Protocol family not supported
EAFNOSUPPORT	47	Address family not supported by protocol family
EADDRINUSE	48	Address already in use
EADDRNOTAVAIL	49	Can't assign requested address
ipc/network software – operational errors		
ENETDOWN	50	Network is down
ENETUNREACH	51	Network is unreachable
ENETRESET	52	Network dropped connection on reset
ECONNABORTED	53	Software caused connection abort
ECONNRESET	54	Connection reset by peer
ENOBUFS	55	No buffer space available
EISCONN	56	Socket is already connected
ENOTCONN	57	Socket is not connected
ESHUTDOWN	58	Can't send after socket shutdown
ETOOMANYREFS	59	Too many references: can't splice
ETIMEOUT	60	Operation timed out
ECONNREFUSED	61	Connection refused
ELOOP	62	Too many levels of symbolic links
ENAMETOOLONG	63	File name too long
should be rearranged		
EHOSTDOWN	64	Host is down

ENOTDIR		A component of the path prefix is not a directory.
ENAMETOOLONG		A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters.
ENOENT		The named file does not exist.
EACCES		Search permission is denied for a component of the path prefix.
ELOOP		Too many symbolic links were encountered in translating the pathname.
EFAULT		Sb or name points to an invalid address.
EIO		An I/O error occurred while reading from or writing to the file system.

ISUID	0004000	set user id on execution
ISGID	0002000	set group id on execution
ISTXT	0001000	sticky bit
IRWXU	0000700	RWX mask for owner
IRUSR	0000400	R for owner
IWUSR	0000200	W for owner
IXUSR	0000100	X for owner
IRWXG	0000070	RWX mask for group
IRGRP	0000040	R for group
IWGRP	0000020	W for group
IXGRP	0000010	X for group
IRWXO	0000007	RWX mask for other
IROTH	0000004	R for other
IWOTh	0000002	W for other
IXOTH	0000001	X for other

13.2 class FolderItem

13.2.1 class FolderItem

Platforms: macOS, Linux, Windows, Targets: All.

Function: One of Xojo's base classes.

Notes: Handles access to files.

13.2.2 Methods

13.2.3 DarwinMediaClassMBS as string

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the class of the media.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop
```

```
MsgBox f.DarwinMediaClassMBS
```

Notes: Returns nil on any problem.

Possible values:

kIOCDMediaClass	"IOCDMedia"
kIODVDMediaClass	"IODVDMedia"
kIOMediaClass	"IOMedia"

See also DarwinMediaInfoMBS function.

Blog Entries

- [MBS Plugins updated for Xojo 2019r2](#)

13.2.4 DarwinMediaInfoMBS as CFDictionaryMBS

Plugin Version: 5.1, Platform: macOS, Targets: All.

Function: Returns the info dictionary of the media.

Example:

```

// info for boot volume
dim info as CFDictionaryMBS = volume(0).DarwinMediaInfoMBS

if info = nil then
  beep // error
else
  CFShowMBS info // show in console

  dim RemovableKey as CFStringMBS = NewCFStringMBS("Removable")
  dim RemovableCFO as CFOBJECTMBS = info.Value(RemovableKey)
  dim RemovableCFB as CFBooleanMBS = CFBooleanMBS(RemovableCFO)
  dim Removable as Boolean = RemovableCFB.Value

  MsgBox "Removable: "+str(Removable)

  dim EjectableKey as CFStringMBS = NewCFStringMBS("Ejectable")
  dim EjectableCFO as CFOBJECTMBS = info.Value(EjectableKey)
  dim EjectableCFB as CFBooleanMBS = CFBooleanMBS(EjectableCFO)
  dim Ejectable as Boolean = EjectableCFB.Value

  MsgBox "Ejectable: "+str(Ejectable)

  dim SizeKey as CFStringMBS = NewCFStringMBS("Size")
  dim SizeCFO as CFOBJECTMBS = info.Value(SizeKey)
  dim SizeCFN as CFNumberMBS = CFNumberMBS(SizeCFO)
  dim Size as Double = SizeCFN.doubleValue / 1000000000.0

  MsgBox "Size: "+str(Size, "0.0")+ " GB"
end if

```

Notes: Returns nil on any problem.

example output for the example code above:

```

<CFDictionary 0x7d60510 [ 0xa01900e0 ] >{ type = fixed-mutable, count = 14, capacity = 14, pairs = (
0 : <CFString 0x7d5ffe0 [ 0xa01900e0 ] >{ contents = "Leaf" } = <CFBoolean 0xa0190b98 [ 0xa01900e0 ]
>{ value = false }
1 : <CFString 0x7d60160 [ 0xa01900e0 ] >{ contents = "Writable" } = <CFBoolean 0xa0190b90 [ 0xa01900e0 ]
>{ value = true }
2 : <CFString 0x7d60310 [ 0xa01900e0 ] >{ contents = "BSD Minor" } = <CFNumber 0x7d60300 [
0xa01900e0 ] >{ value = +0, type = kCFNumberSInt32Type }
6 : <CFString 0x7d60040 [ 0xa01900e0 ] >{ contents = "Preferred Block Size" } = <CFNumber 0x7d5fe90
[ 0xa01900e0 ] >{ value = +512, type = kCFNumberSInt64Type }
11 : <CFString 0x7d604c0 [ 0xa01900e0 ] >{ contents = "BSD Major" } = <CFNumber 0x7d604b0 [
0xa01900e0 ] >{ value = +14, type = kCFNumberSInt32Type }
13 : <CFString 0x7d603b0 [ 0xa01900e0 ] >{ contents = "BSD Name" } = <CFString 0x7d60110 [
0xa01900e0 ] >{ contents = "disk0" }

```

```

14 : <CFString 0x7d600d0 [ 0xa01900e0 ] >{ contents = "Size" } = <CFNumber 0x7d60090 [ 0xa01900e0
] >{ value = +163928604672, type = kCFNumberSInt64Type }
15 : <CFString 0x7d5fef0 [ 0xa01900e0 ] >{ contents = "Content Hint" } = <CFString 0xa0196304 [
0xa01900e0 ] >{ contents = "" }
16 : <CFString 0x7d60020 [ 0xa01900e0 ] >{ contents = "Removable" } = <CFBoolean 0xa0190b98 [
0xa01900e0 ] >{ value = false }
17 : <CFString 0x7d601b0 [ 0xa01900e0 ] >{ contents = "IOMediaIcon" } = <CFDictionary 0x7d60360 [
0xa01900e0 ] >{ type = fixed-mutable, count = 2, capacity = 2, pairs = (
2 : <CFString 0x7d60250 [ 0xa01900e0 ] >{ contents = "CFBundleIdentifier" } = <CFString 0x7d602a0 [
0xa01900e0 ] >{ contents = "com.apple.iokit.IOStorageFamily" }
3 : <CFString 0x7d5ff30 [ 0xa01900e0 ] >{ contents = "IOBundleResourceFile" } = <CFString 0x7d60230
[ 0xa01900e0 ] >{ contents = "Internal.icns" }
) }
19 : <CFString 0x7d603d0 [ 0xa01900e0 ] >{ contents = "BSD Unit" } = <CFNumber 0x7d5ff50 [
0xa01900e0 ] >{ value = +0, type = kCFNumberSInt32Type }
20 : <CFString 0x7d5ff90 [ 0xa01900e0 ] >{ contents = "Ejectable" } = <CFBoolean 0xa0190b98 [
0xa01900e0 ] >{ value = false }
21 : <CFString 0x7d5fea0 [ 0xa01900e0 ] >{ contents = "Content" } = <CFString 0x7d5ff10 [ 0xa01900e0
] >{ contents = "Apple_partition_scheme" }
22 : <CFString 0x7d60120 [ 0xa01900e0 ] >{ contents = "Whole" } = <CFBoolean 0xa0190b90 [ 0xa01900e0
] >{ value = true }
) }

```

If you don't like all the CFDictionaryMBS methods, than use Dictionary function it to get a Xojo dictionary.
Blog Entries

- [MBS Plugins updated for Xojo 2019r2](#)

13.2.5 DarwinVolumeNameMBS as string

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the name of the volume from the BSD part of Mac OS X.

Example:

```
MsgBox Volume(0).DarwinVolumeNameMBS // shows here disk1s10
```

Notes: Returns "" on any error.

The returned string is encoded as ASCII.

Blog Entries

- [MBS Plugins updated for Xojo 2019r2](#)

13.2.6 SetTagNamesMBS(tags() as string) as Integer

Plugin Version: 13.5, Platform: macOS, Targets: All.

Function: Sets file tags.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
```

```
dim Tags() as string = Array("Hello", "World")
```

```
dim e as Integer = f.SetTagNamesMBS(tags)
```

```
MsgBox "SetTagNamesMBS: "+str(e)
```

Notes: tags() is array with new tag names.

Provides error code as return value and details about error in CFErrorMBS object.

Requires Mac OS X 10.9 or newer.

Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.

See also:

- 13.2.7 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer

565

13.2.7 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer

Plugin Version: 13.5, Platform: macOS, Targets: All.

Function: Sets file tags.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
```

```
dim Tags() as string = Array("Hello", "World")
```

```
dim ce as CFErrorMBS
```

```
dim e as Integer = f.SetTagNamesMBS(tags, ce)
```

```
if ce <> nil then
```

```
MsgBox "SetTagNamesMBS: "+str(e)+EndOfLine+ce.Description
```

```
else
```

```
MsgBox "SetTagNamesMBS: "+str(e)
```

```
end if
```

Notes: tags() is array with new tag names.

Provides error code as return value and details about error in CFErrorMBS object.

Requires Mac OS X 10.9 or newer.

Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.

See also:

- 13.2.6 SetTagNamesMBS(tags() as string) as Integer 565

13.2.8 TagNamesMBS as string()

Plugin Version: 13.5, Platform: macOS, Targets: All.

Function: Queries tag names for a file or folder.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim Tags() as string = f.TagNamesMBS
MsgBox "Tags: "+Join(tags, EndOfLine)
```

Notes: Requires Mac OS X 10.9 or newer.

Optionally provides error information in CFErrorMBS object.

Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.

See also:

- 13.2.9 TagNamesMBS(byref e as CFErrorMBS) as string() 566

13.2.9 TagNamesMBS(byref e as CFErrorMBS) as string()

Plugin Version: 13.5, Platform: macOS, Targets: All.

Function: Queries tag names for a file or folder.

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")

dim ce as CFErrorMBS
dim Tags() as string = f.TagNamesMBS(ce)

if ce <> nil then
  MsgBox "Failed: "+ce.Description
else
  MsgBox "Tags: "+Join(tags, EndOfLine)
end if
```

Notes: Requires Mac OS X 10.9 or newer.

Optionally provides error information in CFErrorMBS object.

Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.

See also:

- 13.2.8 TagNamesMBS as string()

Chapter 14

IO Registry

14.1 class DarwinDriveStatisticsMBS

14.1.1 class DarwinDriveStatisticsMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: A class for an iterator over the IORegistry drives.

Example:

```
dim d as DarwinDriveStatisticsMBS
dim l as CFDictionaryMBS
```

```
d=new DarwinDriveStatisticsMBS
l=d.NextDrive
while l<>Nil
  CFShowMBS l
  l=d.NextDrive
wend
```

14.1.2 Methods

14.1.3 close

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

14.1.4 `kIOBlockStorageDriverStatisticsBytesReadKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of bytes read since the block storage driver was instantiated.

This property describes the number of bytes read since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey` property table. It has an `CFNumber` value.

14.1.5 `kIOBlockStorageDriverStatisticsBytesWrittenKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of bytes written since the block storage driver was instantiated.

This property describes the number of bytes written since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey` property table. It has an `CFNumber` value.

14.1.6 `kIOBlockStorageDriverStatisticsKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: The key value used to get a statistics dictionary from the drive information dictionary.

14.1.7 `kIOBlockStorageDriverStatisticsLatentReadTimeKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of nanoseconds of latency during reads since the block storage driver was instantiated.

This property describes the number of nanoseconds of latency during reads since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey`

property table. It has an CFNumber value.

14.1.8 kIOBlockStorageDriverStatisticsLatentWriteTimeKey as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of nanoseconds of latency during writes since the block storage driver was instantiated.

This property describes the number of nanoseconds of latency during writes since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

14.1.9 kIOBlockStorageDriverStatisticsReadErrorsKey as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of read errors encountered since the block storage driver was instantiated.

This property describes the number of read errors encountered since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

14.1.10 kIOBlockStorageDriverStatisticsReadRetriesKey as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of read retries required since the block storage driver was instantiated.

This property describes the number of read retries required since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

14.1.11 kIOBlockStorageDriverStatisticsReadsKey as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of read operations processed since the block storage driver was instantiated.

This property describes the number of read operations processed since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey` property table. It has an `CFNumber` value.

14.1.12 `kIOBlockStorageDriverStatisticsTotalReadTimeKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of nanoseconds spent performing reads since the block storage driver was instantiated.

This property describes the number of nanoseconds spent performing reads since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey` property table. It has an `CFNumber` value.

14.1.13 `kIOBlockStorageDriverStatisticsTotalWriteTimeKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of nanoseconds spent performing writes since the block storage driver was instantiated.

This property describes the number of nanoseconds spent performing writes since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey` property table. It has an `OSNumber` value.

14.1.14 `kIOBlockStorageDriverStatisticsWriteErrorsKey` as `CFStringMBS`

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of write errors encountered since the block storage driver was instantiated. This property describes the number of write errors encountered since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level `kIOBlockStorageDriverStatisticsKey` property table. It has an `CFNumber` value.

14.1.15 kIOBlockStorageDriverStatisticsWriteRetriesKey as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of write retries required since the block storage driver was instantiated.

This property describes the number of write retries required since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an OSNumber value.

14.1.16 kIOBlockStorageDriverStatisticsWritesKey as CFStringMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: One of the keys for the statistics dictionary.

Notes: Describes the number of write operations processed since the block storage driver was instantiated.

This property describes the number of write operations processed since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

14.1.17 NextDrive as CFDictionaryMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the dictionary describing the next drive in the list.

14.1.18 Reset

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Moves you back to the beginning of the list.

14.1.19 Properties

14.1.20 Handle as Integer

Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

Function: Internal object reference.

Notes: (Read and Write property)

14.2 module IORegistryMBS

14.2.1 module IORegistryMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: A module for accessing the Mac OS X IO Registry.

Notes: The IORegistryMBS stores information about the installed hardware.

Blog Entries

- [MBS Xojo Plugins, version 20.1pr3](#)
- [MBS Xojo Plugins, version 19.0pr9](#)
- [MBS Xojo / Real Studio Plugins, version 16.3pr4](#)
- [MBS Xojo / Real Studio Plugins, version 15.1pr7](#)
- [MBS Real Studio Plugins, version 11.2pr7](#)
- [Addressbook classes updated](#)

14.2.2 Methods

14.2.3 AudioRoot as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the Audio tree inside the IO Registry.

14.2.4 DeviceRoot as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the Device tree inside the IO Registry.

14.2.5 FirewireRoot as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the Firewire tree inside the IO Registry.

14.2.6 MatchingServices(servicename as string) as IORegistryNodeMBS()

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the nodes matching the servicename.

Example:

```
// search for Serial devices
dim devices() as IORegistryNodeMBS = IORegistryMBS.MatchingServices("IOSerialBSDClient")
dim names(-1) as string

// check devices and query names
for each dev as IORegistryNodeMBS in devices
dim dic as Dictionary = dev.Properties
names.Append dic.Lookup("IOTTYBaseName", "")
next

// show all names
MsgBox Join(names, EndOfLine)
```

14.2.7 PerformanceStatistics(index as Integer = 0) as Dictionary

Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

Function: Queries performance statistics for first graphics card on a Mac.

Example:

```
dim d as Dictionary = IORegistryMBS.PerformanceStatistics

if d <> nil then

dim gpuCoreUse as Int64 = d.Value("GPU Core Utilization")
dim freeVramCount as Int64 = d.Value("vramFreeBytes")
dim usedVramCount as Int64 = d.Value("vramUsedBytes")

dim sum as int64 = (freeVramCount+usedVramCount)

List.AddRow format(gpuCoreUse/1000000000.0, "0%"), Format(freeVramCount/1024.0/1024.0, "0")+ " MB
of "+Format(sum/1024.0/1024.0, "0")+ " MB", Format(usedVramCount / sum, "0%")
list.ScrollPosition = list.ListCount
else
Break
end if
```

Notes: The dictionary contains details about performance of graphics card.

This includes vramFreeBytes and vramUsedBytes for memory usage as well as "GPU Core Utilization" key with GPU time used.

Returns nil on any error.

Index is zero for first graphics card.

Or 1 for second graphics card.

14.2.8 PowerRoot as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the Power tree inside the IO Registry.

14.2.9 Present as Boolean

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Is the IORegistryMBS working?

Notes: Returns true on Mac OS X and false on other platforms.

14.2.10 Root(plane as string) as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the IORegistry tree with the given plane name.

Example:

```
// shows names of all USB devices
dim u as IORegistryNodeMBS = IORegistryMBS.Root("IOUSB") // same as USBRoot function

// now loop over all devices with all children (non recursive)
dim names(-1) as string
dim nodes(-1) as IORegistryNodeMBS = array(u)

while UBound(nodes)>=0
dim p as IORegistryNodeMBS = nodes.pop

names.Append p.Name
for each c as IORegistryNodeMBS in p.Children
nodes.Append c
next
wend
```

```
// and display array with names
MsgBox Join(names,EndOfLine)
```

14.2.11 ServiceRoot as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the Service tree inside the IO Registry.

14.2.12 USBRoot as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the root of the USB tree inside the IO Registry.

Example:

```
// shows names of all USB devices
dim u as IORegistryNodeMBS = IORegistryMBS.USBRoot

// now loop over all devices with all children (non recursive)
dim names(-1) as string
dim nodes(-1) as IORegistryNodeMBS = array(u)

while UBound(nodes)>=0
dim p as IORegistryNodeMBS = nodes.pop

names.Append p.Name
for each c as IORegistryNodeMBS in p.Children
nodes.Append c
next
wend

// and display array with names
MsgBox Join(names,EndOfLine)
```

14.3 class IORegistryNodeMBS

14.3.1 class IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: A class for a node inside the IO Registry.

14.3.2 Methods

14.3.3 CFProperties as CFDictionaryMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a CFDictionary object with all the properties of this note.

14.3.4 Child(index as Integer) as IORegistryNodeMBS

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the IORegistryNodeMBS with the given index.

Notes: Index from 0 to ChildCount-1.

14.3.5 Children as IORegistryNodeMBS()

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns an array with all child nodes.

14.3.6 Parents as IORegistryNodeMBS()

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns an array with all parent nodes.

14.3.7 Properties as Dictionary

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Creates a Xojo dictionary with all the properties of this note.

14.3.8 Properties

14.3.9 Busy as Integer

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns the busyState of an IOService.

Notes: Many activities in IOService are asynchronous. When registration, matching, or termination is in progress on an IOService, its busyState is increased by one. Change in busyState to or from zero also changes the IOService's provider's busyState by one, which means that an IOService is marked busy when any of the above activities is occurring on it or any of its clients.

(Read only property)

14.3.10 ChildCount as Integer

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Count of sub nodes.

Notes: (Read only property)

14.3.11 DataCount as Integer

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Count of data items.

Notes: (Read only property)

14.3.12 IOClass as String

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: The name of the IOKit class.

Notes: (Read only property)

14.3.13 Name as String

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: The name of this node.

Notes: (Read only property)

14.3.14 ParentCount as Integer

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: The number of parent nodes for this node.

Notes: Typically one.

(Read only property)

14.3.15 Path as String

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: The path of this node.

Notes: Useful for finding a node again.

(Read only property)

14.3.16 RetainCount as Integer

Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

Function: Retain count of this object.

Notes: (Read only property)

Chapter 15

Login Items

15.1 module ServiceManagementModuleMBS

15.1.1 module ServiceManagementModuleMBS

Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

Function: The module with function to add helper to login items.

Notes: This API seems to be sandbox safe and working with Mac App Store.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 16.4pr6](#)
- [MBS Real Studio Plugins, version 12.3pr9](#)
- [Adding Login Items on Mac OS X](#)

15.1.2 Methods

15.1.3 AllJobDictionaries(domain as string) as Dictionary()

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Returns the job description dictionaries for all jobs in the given domain.

Notes: domain: The desired domain (e.g. kSMDomainSystemLaunchd).

Returns a new array containing all job dictionaries, or empty array if an error occurred. Must be released by the caller.

Available in OS X v10.6 and later.

15.1.4 CreateAuthorization as AuthorizationMBS

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Creates an authorization for Job operations.

Notes: Creates an authorization with kSMRightBlessPrivilegedHelper and flags InteractionAllowed, PreAuthorize and ExtendRights.

15.1.5 JobBless(domain as string, executableLabel as string, auth as AuthorizationMBS, byref error as Variant) as boolean

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Submits the executable for the given label as a launchd job.

Notes: domain: The job's domain. Only kSMDomainSystemLaunchd is supported.

executableLabel: The label of the privileged executable to install. This label must be one of the keys found in the SMPrivilegedExecutables dictionary in the application's Info.plist.

auth: An authorization reference containing the kSMRightBlessPrivilegedHelper right.

Error: An output reference to a CFErrorMBS describing the specific error encountered while submitting the executable tool, or nil if successful. It is the responsibility of the application to release the error reference.

Returns true if the job was successfully submitted, otherwise false.

JobBless submits the executable for the given label as a launchd job. This function obviates the need for a setuid helper invoked via AuthorizationExecuteWithPrivileges in order to install a launchd plist.

If the job is already installed, success is returned.

In order to use this function the following requirements must be met:

- The calling application and target executable tool must both be signed.
- The calling application's Info.plist must include a "SMPrivilegedExecutables" dictionary of strings. Each string is a textual representation of a code signing requirement used to determine whether the application owns the privileged tool once installed (i.e. in order for subsequent versions to update the installed version).

Each key of SMPrivilegedExecutables is a reverse-DNS label for the helper tool (must be globally unique).

- The helper tool must have an embedded Info.plist containing an "SMAuthorizedClients" array of strings. Each string is a textual representation of a code signing requirement describing a client which is allowed to add and remove the tool.

- The helper tool must have an embedded launchd plist. The only required key in this plist is the Label key. When the launchd plist is extracted and written to disk, the key for ProgramArguments will be set to an array of 1 element pointing to a standard location. You cannot specify your own program arguments, so do not rely on custom command line arguments being passed to your tool. Pass any parameters via IPC.
- The helper tool must reside in the Contents/Library/LaunchServices directory inside the application bundle, and its name must be its launchd job label. So if your launchd job label is "com.apple.Mail.helper", this must be the name of the tool in your application bundle.

Available in OS X v10.6 and later.

15.1.6 JobDictionary(domain as string, jobLabel as string) as Dictionary

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Returns the job description dictionary for the given job label.

Notes: domain: The job's domain (e.g. kSMDomainSystemLaunchd).

jobLabel: The label identifier for the job to copy.

Return a new dictionary describing the job, or nil if the job could not be found.

Available in OS X v10.6 and later.

15.1.7 JobRemove(domain as string, jobLabel as string, auth as AuthorizationMBS, wait as boolean, byref error as CFErrorMBS) as boolean

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Removes the job with the given label from the specified domain.

Notes: domain: The job's domain (e.g. kSMDomainSystemLaunchd).

jobLabel: The label for the job to remove.

auth: An AuthorizationRef containing the kSMRightModifySystemDaemons right if the given domain is kSMDomainSystemLaunchd.

wait: Pass true to block until the process for the given job has exited.

Error: An output reference to a CFErrorMBS describing the specific error encountered while submitting the job dictionary, or nil if no error occurred. It is the responsibility of the application to release the error reference.

Returns true if the job was removed successfully, otherwise false.

JobSubmit removes the job specified by label from the domain. If the job is currently running, it will conditionally block until the running process has exited.

Available in OS X v10.6 and later.

15.1.8 JobSubmit(domain as string, job as Dictionary, auth as AuthorizationMBS, byref error as CFErrorMBS) as boolean

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Submits the given job to the specified domain.

Notes: domain: The job's domain (e.g. kSMDomainSystemLaunchd).

job: A dictionary describing a job.

auth: An AuthorizationRef containing the kSMRightModifySystemDaemons right if the given domain is kSMDomainSystemLaunchd.

Error: An output reference to a CFErrorMBS describing the specific error encountered while submitting the job dictionary, or NULL if no error occurred. It is the responsibility of the application to release the error reference.

Returns true if the job was submitted successfully, otherwise false.

JobSubmit submits the given job to the specified domain.

Available in OS X v10.6 and later.

15.1.9 kSMDomainSystemLaunchd as string

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: System-level launchd domain.

15.1.10 kSMDomainUserLaunchd as string

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: User-level launchd domain.

15.1.11 kSMInfoKeyAuthorizedClients as string

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Authorized clients property list key.

15.1.12 kSMInfoKeyPrivilegedExecutables as string

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

Function: Privileged executables property list key.

15.1.13 LoginItemRunning(identifier as string) as boolean

Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

Function: Checks whether a login item is running.

Notes: Actually checks if there is a record for your helper, so if it crashed, this returns still true.

15.1.14 LoginItemSetEnabled(identifier as string, enabled as boolean) as boolean

Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

Function: Enable a helper application located in the main application bundle's Contents/Library/LoginItems directory.

Notes: identifier: The bundle identifier of the helper application bundle.

enabled: The Boolean enabled state of the helper application. This value is effective only for the currently logged in user. If true, the helper application will be started immediately (and upon subsequent logins) and kept running. If false, the helper application will no longer be kept running.

Returns true if the requested change has taken effect.

15.1.15 RegisterHelperApp(name as string, Update as boolean = false) as boolean

Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

Function: Registers a helper application in the Launch Services database.

Notes: The app must exist with given name inside the bundle in Library/LoginItems folder.

Update: A Boolean value specifying whether Launch Services should update existing information registered for the application, if any. If this parameter is false, the application will not be registered if it has already been registered previously and its current modification date has not changed from when it was last registered; if the parameter is true, the application's registered information will be updated even if its modification date has not changed.

Returns true on success and false on failure.

15.2 class SMLaunchAgentMBS

15.2.1 class SMLaunchAgentMBS

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: An object the framework uses to control helper executables that live inside an app’s main bundle.

Notes: In macOS 13 and later, use SMLaunchAgent to register and control LoginItems, LaunchAgents, and LaunchDaemons as helper executables for your app. When converting code from earlier versions of macOS, use an SMLaunchAgent object and select one of the following methods depending on the type of service your helper executable provides:

- For SMLaunchAgents initialized as LoginItems, the register and unregister APIs provide a replacement for SMLaunchAgentItemSetEnabled.
- For SMLaunchAgents initialized as LaunchAgents, the register and unregister methods provide a replacement for installing property lists in `/Library/LaunchAgents` or `/Library/LaunchAgents`.
- For SMLaunchAgents initialized as LaunchDaemons, the register and unregister methods provide a replacement for installing property lists in `/Library/LaunchDaemons`.

Requires macOS 13.0.

Blog Entries

- [News from the MBS Xojo Plugins in Version 23.0](#)

15.2.2 Methods

15.2.3 agentService(plistName as String) as SMLaunchAgentMBS

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Initializes an app service object with a launch agent with the property list name you provide.

Notes: plistName: The name of the property list corresponding to the SMLaunchAgent.

The property list name must correspond to a property list in the calling app’s Contents/Library/LaunchAgents directory.

15.2.4 Constructor

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: The constructor.

Notes: An app service object that corresponds to the main application as a login item. Use this SMapServiceMBS to configure the main app to launch at login.

15.2.5 daemonService(plistName as String) as SMapServiceMBS

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Initializes an app service object with a launch daemon with the property list name you provide.

Notes: plistName: The name of the property list corresponding to the SMapService.

Returns an SMapService object

The property list name must correspond to a property list in the calling app,Ãs Contents/Library/Launch-Daemons directory

15.2.6 loginItemService(identifier as String) as SMapServiceMBS

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Initializes an app service object for a login item corresponding to the bundle with the identifier you provide.

Notes: identifier: The bundle identifier of the helper application.

Returns an SMapService object.

The property list name must correspond to a property list in the calling app,Ãs Contents/Library/LoginItems directory.

15.2.7 mainAppService as SMapServiceMBS

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: An app service object that corresponds to the main application as a login item.

Notes: Use this SMapServiceMBS to configure the main app to launch at login.

15.2.8 openSystemSettingsLoginItems

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Opens System Settings to the Login Items control panel.

15.2.9 register(byref error as NSErrorMBS) as Boolean

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Registers the service so it can begin launching subject to user approval.

Notes: The registration process applies to the following rules, depending upon the type of service:

- If the service corresponds to a LoginItem bundle, the helper starts immediately and on subsequent logins. If the helper crashes or exits with a non-zero status, the system relaunches it.
- If the service corresponds to the main application, the application launches on subsequent logins.
- If the service corresponds to a LaunchAgent, the LaunchAgent is immediately bootstrapped and may begin running. In addition LaunchAgents registered with this method bootstrap on each subsequent login.
- If an app needs to register a LaunchAgent for multiple users, you must call the API once per user while that user is running the app.
- If the service corresponds to a LaunchDaemon, the system won't bootstrap the LaunchDaemon until an admin approves the LaunchDaemon in System Preferences. The system bootstraps LaunchDaemons registered with this method and approved by an admin on each subsequent boot.

If the service is already registered, this method returns kSMErrorAlreadyRegistered.

If the service isn't approved by the user, this method returns kSMErrorLaunchDeniedByUser.

15.2.10 statusForLegacyFile(File as FolderItem) as Integer

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Check the authorization status of an earlier OS version login item.

Notes: File: The folderitem of the helper executable's property list.

Returns one of the SMApServiceStatus constants that indicate the current authorization status.

15.2.11 statusForLegacyURL(URL as String) as Integer

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Check the authorization status of an earlier OS version login item.

Notes: url: The URL of the helper executable,Ãs property list.

Returns one of the SMapServiceStatus constants that indicate the current authorization status.

15.2.12 unregister(byref error as NSErrorMBS) as Boolean

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Unregisters the service so the system no longer launches it.

Notes: error: Upon an unsuccessful return, a new NSError object describing the error. Upon successful return, this argument is nil. This argument may be NULL.

Returns true if the service was successfully unregistered; otherwise, false.

This is the opposite operation of register().

If the service corresponds to a LoginItem, LaunchAgent, or LaunchDaemon and the service is currently running it, the system terminates it. If the service corresponds to the main application, it continues running, but becomes unregistered to prevent future launches at login.

If the service is already unregistered, this method returns kSMErrorJobNotFound.

See also:

- 15.2.13 unregister(CompleteHandler as SMapServiceUnregisterCompletedMBS, tag as variant = nil)
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15.2.13 unregister(CompleteHandler as SMapServiceUnregisterCompletedMBS, tag as variant = nil)

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: Unregisters the service so the system no longer launches it and calls a completion handler you provide with the resulting error value.

Notes: CompleteHandler: A completion handler to call with the result of the unregistration operation. Upon an unsuccessful return, the handler contains a new NSErrorMBS object describing the error. Upon successful return, this argument is nil.

See also:

- 15.2.12 unregister(byref error as NSErrorMBS) as Boolean

15.2.14 Properties

15.2.15 Handle as Integer

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

15.2.16 Status as Integer

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: A property that describes registration or authorization state of the service.

Notes: (Read only property)

15.2.17 Constants

Service Status

Constant	Value	Description
<code>SMAAppServiceStatusEnabled</code>	1	The service has been successfully registered and is eligible to run.
<code>SMAAppServiceStatusNotFound</code>	3	An error occurred and the framework couldn't find this service.
<code>SMAAppServiceStatusNotRegistered</code>	0	The service hasn't registered with the Service Management framework or the service attempted to reregister after it was already registered.
<code>SMAAppServiceStatusRequiresApproval</code>	2	The service has been successfully registered, but the user needs to take action in System Preferences. The Service Management framework successfully registered this service but the user needs to take action in System Settings before the service is eligible to run. The framework also returns this status if the user revokes consent for the service to run in System Settings.

15.2.18 Delegates

15.2.19 `SMAAppServiceUnregisterCompletedMBS`(Error as `NSErrorMBS`, Tag as Variant)

Plugin Version: 23.0, Platform: macOS, Targets: All.

Function: The delegate used with `unregister` method.

Notes: A handler to call with the result of the unregistration operation. Upon an unsuccessful return, the handler contains a new `NSErrorMBS` object describing the error. Upon successful return, this argument is `nil`.

Chapter 16

MIDI

16.1 class MidiClientMBS

16.1.1 class MidiClientMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: A class for the global MIDI stuff on Mac OS X.

Notes: Only make one instance of this class in your application.

From Apple's documentation:

History:

Apple's MIDI Manager (ca. 1990) had a simple model of the world. There were application and driver clients, which had MIDI in/out ports, which could be interconnected in arbitrary ways. This model failed to provide a way for applications to make reasonable assumptions about how to make bi-directional connections to a MIDI device. MIDI Manager also had limitations on the number of ports per client, and became very unwieldy with the advent of large studios and multi-port MIDI interfaces such as the MIDI Time Piece and Studio 5.

Opcodes's OMS (1991) addressed some of the shortcomings of MIDI Manager. There was the concept of a studio setup document, where drivers detected their devices, and the user could define the characteristics of additional devices connected to the MIDI ports. Applications could view the studio both as a collection of MIDI source and destination "nodes", but also as a collection of devices. OMS collected information about, and made available to its clients, useful characteristics of the devices in the studio, such as their system-exclusive IDs, MIDI channels on which they were listening, which were controllers (as opposed to simple tone generators), etc.

API Overview:

This design expands slightly on OMS's device/node hierarchy, inspired by the USB MIDI spec.

Drivers own and control devices, e.g. USB interfaces, PCI cards, etc. A device is defined as a physical object that would be represented by a single icon if there were a graphical view of the studio.

Devices may have multiple logically distinct sub-components, e.g. a MIDI synthesizer and a pair of MIDI ports, both addressable via a USB port. These are called Entities.

Entities have any number of Endpoints, sources and destinations of 16-channel MIDI streams. By grouping a device's endpoints into entities, the system has enough information for an application to make reasonable assumptions about how to communicate in a bi-directional manner with each entity, as is necessary in MIDI librarian applications.

Third-party services like FreeMIDI or OMS can collect and report interesting properties of a device by attaching those properties to the devices' entities – CoreMIDI provides a central database, but no user interfaces.. It's worth noting that some device characteristics are dynamic (e.g. MIDI receive channel and system-exclusive ID's), or a matter of user preference (choice of icon, whether the device should appear in lists of possible controllers), while other properties are static and could be looked up in a database, using the device's manufacturer and model names as a key.

Persistent configurations / Device Information:

There are a number of reasons why CoreMIDI has a persistent state.

Entities must have persistent IDs. When a new unique resource is a representing application to an endpoint, the application needs a way to obtain a permanent reference to the selected endpoint. A heuristic method of generating a persistent ID would be to combine the driver name, device name, entity name, and endpoint type and index into a string, but this is not very friendly to clients even if the system provides services to generate and decode these strings.

Consider a USB MIDI interface driver, in the case where there are two instances of one model of interface present. The driver needs a way to permanently distinguish, to the system and its clients, between the two interfaces. Which is #1 and which is #2? If #1 gets unplugged, #2 should not automatically become #1; the user's documents may be referring to devices which were attached to #2.

The system needs a persistent concept of which driver's device is attached to a serial port.

Some drivers will need to store configuration information about the devices they control. For example, the driver for a standard MIDI interface on a serial port needs to remember which external clocking speed to use (this is a simple, slightly obscure, but hardly unique example). The Alesis Q8T is capable of communicating at a variety of speeds, so its driver needs to remember the correct speed.

These needs for persistent configuration information provide a rationale for having something akin to OMS's studio setup document, a saved configuration for the system. Mobile users who work in multiple environments could select between multiple saved configurations in a Location Manager-compatible manner.

Given services with which to store driver configuration information, we then have built the groundwork for a client studio setup editor application.

Such an application can define external MIDI devices (not to be confused with the driver-owned cards/

interfaces/etc whose presence in the configuration is determined by the driver).

Moreover, since a driver knows exactly what device it is communicating with, it is capable of supplying information to the system about the characteristics of the device, such as its system-exclusive ID, whether it is General MIDI or DLS-compatible, etc.

But unlike OMS, the system is able to begin functioning immediately, using only the MIDI devices/endpoints detected by the drivers, without forcing the user to go through a somewhat lengthy and confusing initial configuration process. Definition of external MIDI devices can be a completely optional step, only made possible when a client application requests that they be added to the configuration.

Implementation overview:

The client API is implemented as the CoreMIDI framework, which uses IPC to communicate with a server process, MIDIServer.

The server process loads, and manages all communication with, MIDI drivers. Most of its implementation is in the CoreMIDIServer framework, which drivers may import in order to access the API.

”Drivers” are not I/O Kit drivers. They are dynamic libraries, using CFPlugin.

Many MIDI drivers can simply be user-side I/O Kit clients (probably for serial, USB, Firewire).

PCI card drivers will need their MIDI drivers to communicate with a separate kernel extension.

If you have an old file named EmagicUSBMIDIPlugin.plugin in your /Library/Audio/MIDI Drivers folder, please remove it. It makes trouble with our Midi classes.

See also macOS specific classes AVMIDIPlayerMBS and MidiPlaybackMBS for playback. For Windows see also WindowsMidiMBS class.

See also PortMidiMBS class for cross platform Midi handling.

Subclass of the MidiObjectMBS class.

Blog Entries

- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4](#)
- [MBS Xojo Plugins, version 23.4pr2](#)
- [MBS Real Studio Plugins, version 11.3fc](#)

Xojo Developer Magazine

- [21.6, page 8: News](#)

16.1.2 Methods

16.1.3 Available as boolean

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: True if the MIDI stuff was successful loaded.

16.1.4 close

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.1.5 CreateDestination(name as CFStringMBS, TargetEndpointObject as MidiEndpointMBS)

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: Create a virtual destination in a client.

Notes: Clients may use this to create virtual destinations.

Lasterror is set.

You must pass a valid new MidiEndpointMBS for TargetEndpointObject. Best is if you make a subclass from MidiEndpointMBS and fill the event. You can add there additional methods and properties. CreateDestination will then fill the handle property on success.

16.1.6 CreateInputPort(name as CFStringMBS, targetportobject as MidiPortMBS)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Create an input port through which the client may receive incoming MIDI messages from any MIDI source.

Example:

```
dim mc as MidiClientMBS
dim mp as MidiPortMBS

mc=new MidiClientMBS
mc.Init NewCFStringMBS("Testapp")

mp=new MidiPortMBS
```

```
mc.CreateInputPort NewCFStringMBS("Testport"), mp
```

```
if mp.Handle=0 then
MsgBox "There was an error: "+str(mc.Lasterror)
else
MsgBox "ok"
end if
```

Notes: After creating a port, use `MIDIPortConnectSource` to establish an input connection from any number of sources to your port.

Lasterror is set.

As you can subclass the `MidiPortMBS` class you must pass to this function a valid `MidiPortMBS` object so it can be filled.

16.1.7 CreateOutputPort(name as CFStringMBS, targetportobject as MidiPortMBS)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Create an output port through which the client may send outgoing MIDI messages to any MIDI destination.

Example:

```
dim mc as MidiClientMBS
dim mp as MidiPortMBS

mc=new MidiClientMBS
mc.Init NewCFStringMBS("Testapp")

mp=new MidiPortMBS
mc.CreateOutputPort NewCFStringMBS("Testport"), mp

if mp.Handle=0 then
MsgBox "There was an error: "+str(mc.Lasterror)
else
MsgBox "ok"
end if
```

Notes: Output ports provide a mechanism for MIDI merging. The system assumes that each output port will be responsible for sending only a single MIDI stream to each destination, although a single port may

address all of the destinations in the system.

Lasterror is set.

As you can subclass the MidiPortMBS class you must pass to this function a valid MidiPortMBS object so it can be filled.

16.1.8 CreateSource(name as CFStringMBS) as MidiEndpointMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new virtual Midi source.

Example:

```
dim m as MidiClientMBS
dim e as MidiEndpointMBS

m=new MidiClientMBS

// Initialize
m.Init NewCFStringMBS("Hallo")

// Create device:
e=m.CreateSource(NewCFStringMBS("Hallo"))

// if error is 0 and handle is not 0, it's okay
MsgBox "error: "+str(m.Lasterror)+"", handle: "+str(e.Handle)
```

Notes: Lasterror is set.

Returns nil on any error.

Clients may use this to create virtual sources.

After creating a virtual source, use Received to transmit MIDI messages from your virtual source to any clients connected to the virtual source.

16.1.9 FindObjectByUniqueID(id as Integer) as MidiObjectMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Locate a device, typedefal device, entity, or endpoint by its uniqueID.

Notes: New for CoreMIDI 1.3.

You may cast the returned object to `MidiEndpointMBS`, `MidiEntityMBS` or `MidiDeviceMBS`. RB's "isa" command may help you.

Returns nil on any error. `Lasterror` is set.

16.1.10 `GetDestination(index as Integer)` as `MidiEndpointMBS`

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of the destinations in the system.

Notes: The index goes from 0 to `NumberOfDestinations-1`.

`Lasterror` is set.

Returns nil on any error.

16.1.11 `GetDevice(index as Integer)` as `MidiDeviceMBS`

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of the devices in the system.

Notes: To enumerate the entities in the system, you can walk through the devices, then walk through the devices' entities.

Note: If a client iterates through the devices and entities in the system, it will not ever visit any virtual sources and destinations created by other clients. Also, a device iteration will return devices which are "offline" (were present in the past but are not currently present), while iterations through the system's sources and destinations will not include the endpoints of offline devices.

Thus clients should usually prefer `NumberOfSources`, `GetSource`, `NumberOfDestinations` and `GetDestination` to iterating through devices and entities to locate endpoints.

`Lasterror` is set.

Returns nil on any error.

16.1.12 `GetExternalDevice(index as Integer)` as `MidiDeviceMBS`

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of the external devices in the system.

Notes: The index goes from 0 to `NumberOfDevices-1`.

`Lasterror` is set.

Returns nil on any error.

16.1.13 GetSource(index as Integer) as MidiEndpointMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of the sources in the system.

Notes: The index goes from 0 to NumberOfSources-1.

Lasterror is set.

Returns nil on any error.

16.1.14 Init(name as CFStringMBS)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Creates a new Client object with the given client name.

Notes: Lasterror is set.

16.1.15 NumberOfDestinations as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the number of destinations in the system.

Example:

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfDestinations
```

```
MsgBox "NumberOfDestinations: "+str(n)
```

Notes: Returns 0 on any error.

Lasterror is set.

16.1.16 NumberOfDevices as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the number of devices in the system.

Example:

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfDevices
```

```
MsgBox "NumberOfDevices: "+str(n)
```

Notes: Returns 0 on any error.
LastError is set.

16.1.17 NumberOfExternalDevices as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the number of typedefal MIDI devices in the system.

Example:

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfExternalDevices
```

```
MsgBox "NumberOfExternalDevices: "+str(n)
```

Notes: External MIDI devices are MIDI devices connected to endpoints via a standard MIDI cable. Their presence is completely optional, only when a UI somewhere adds them.

New for CoreMIDI 1.1.

Returns 0 on any error.
LastError is set.

16.1.18 NumberOfSources as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the number of sources in the system.

Example:

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfSources
```

```
MsgBox "NumberOfSources: "+str(n)
```

Notes: Returns 0 on any error.
LastError is set.

16.1.19 Restart as Integer

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Stops and restarts MIDI I/O.

Notes: This is useful for forcing CoreMIDI to ask its drivers to rescan for hardware.
Returns the Mac OS X error code.

16.1.20 Send(port as MidiPortMBS, endpoint as MidiEndpointMBS, packets as MidiPacketListMBS)

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Sends midi data using the port to the given endpoint.

Example:

```
// Not 100% if this example works:
dim client as MIDIClientMBS
dim output as MIDIPortMBS
dim dest as MIDIEndpointMBS
dim pack as MIDIPacketMBS
dim list as MIDIPacketListMBS
dim packs(-1) as MIDIPacketMBS

client = new MidiClientMBS

if client <> nil then
client.Init newcfstringmbs("CoreMIDI")
output = new MIDIPortMBS
client.CreateOutputPort(NewCFStringMBS("output"), output)
dest = client.getDestination(0)
output.connectSource dest

pack = new MIDIPacketMBS
list = new MIDIPacketListMBS
pack.timeStamp = nil
pack.datastring = chr(&h90)+chr(&h5A)+chr(&h7C)
packs.append pack
if not list.FillList(packs) then
msgBox "bad"
end
```

```
client.Send(outport, dest, list)
end
```

Notes: Events with future timestamps are scheduled for future delivery. The system performs any needed MIDI merging.

Lasterror is set.

16.1.21 Events

16.1.22 ObjectAdded(parent as MidiObjectMBS, child as MidiObjectMBS)

Plugin Version: 3.1, Platform: macOS, Targets: .

Function: Called when an object is added to a MidiObject.

16.1.23 ObjectRemoved(parent as MidiObjectMBS, child as MidiObjectMBS)

Plugin Version: 3.1, Platform: macOS, Targets: .

Function: Called when an object is removed from a MidiObject.

16.1.24 PropertyChanged(target as MidiObjectMBS, theProperty as CFStringMBS)

Plugin Version: 3.1, Platform: macOS, Targets: .

Function: Called when a property was changed.

16.1.25 SerialPortOwnerChanged

Plugin Version: 3.1, Platform: macOS, Targets: .

Function: A persistent MIDI Thru connection was created or destroyed.

Notes: New for CoreMIDI 1.3.

16.1.26 SetupChanged

Plugin Version: 3.1, Platform: macOS, Targets: .

Function: Some aspect of the current MIDISetup has changed.

Notes: You should ignore this message if you handle the other messages.

16.1.27 ThruConnectionsChanged

Plugin Version: 3.1, Platform: macOS, Targets: .

Function: A persistent MIDI Thru connection was created or destroyed.

Notes: New for CoreMIDI 1.3.

16.1.28 Constants

Constants

Constant	Value	Description
kMIDIIDNotUnique	-10843	One of the type constants for a MIDI error. Attempt to set a non-unique kMIDIPropertyUniqueID on an object.
kMIDIInvalidClient	-10830	One of the type constants for a MIDI error. An invalid MIDIClientRef was passed.
kMIDIInvalidPort	-10831	One of the type constants for a MIDI error. An invalid MIDIPortRef was passed.
kMIDIInvalidUniqueID	0	A constant for an invalid unique ID.
kMIDIMessageSendErr	-10838	One of the type constants for a MIDI error. Communication with MIDIServer failed.
kMIDIMsgIOError	7	One of the type constants for a MIDI Notification. A driver I/O error occurred.
kMIDIMsgObjectAdded	2	One of the type constants for a MIDI Notification. A device, entity or endpoint was added.
kMIDIMsgObjectRemoved	3	One of the type constants for a MIDI Notification. A device, entity or endpoint was removed.
kMIDIMsgPropertyChanged	4	One of the type constants for a MIDI Notification. An object's property was changed.
kMIDIMsgSerialPortOwnerChanged	6	One of the type constants for a MIDI Notification. A persistent MIDI Thru connection was created or destroyed. No data. for CoreMIDI 1.3.
kMIDIMsgSetupChanged	1	One of the type constants for a MIDI Notification. Some aspect of the current MIDISetup has changed. No data. Should ignore this message if messages 2-6 are handled.
kMIDIMsgThruConnectionsChanged	5	One of the type constants for a MIDI Notification. A persistent MIDI Thru connection was created or destroyed. No data. for CoreMIDI 1.3.
kMIDINoConnection	-10833	One of the type constants for a MIDI error. Attempt to close a non-existent connection.
kMIDINoCurrentSetup	-10837	One of the type constants for a MIDI error. Internal error; there is no current MIDI setup object.
kMIDIObjectNotFound	-10842	One of the type constants for a MIDI error. The requested object does not exist.
kMIDIServerStartErr	-10839	One of the type constants for a MIDI error. Unable to start MIDIServer.
kMIDISetupFormatErr	-10840	One of the type constants for a MIDI error. Unable to read the saved state.
kMIDIUnknownEndpoint	-10834	One of the type constants for a MIDI error. An invalid MIDIEndpointRef was passed.
kMIDIUnknownProperty	-10835	One of the type constants for a MIDI error. Attempt to query a property not set on the object.
kMIDIWrongEndpointType	-10832	One of the type constants for a MIDI error. A source endpoint was passed to a function expecting a destination, or vice versa.
kMIDIWrongPropertyType	-10836	One of the type constants for a MIDI error. Attempt to set a property with a value not of the correct type.
kMIDIWrongThread	-10841	One of the type constants for a MIDI error. A driver is calling a non-I/O function in the server from a thread other than the server's main thread.

16.2 class MidiDeviceMBS

16.2.1 class MidiDeviceMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: A class for a MIDI device.

Notes: A MIDI device, which either attaches directly to the computer and is controlled by a MIDI driver, or which is "external," meaning that it is connected to a driver-controlled device via a standard MIDI cable. Subclass of the MidiObjectMBS class.

16.2.2 Methods

16.2.3 GetEntity(index as Integer) as MidiEntityMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of a given device's entities.

Notes: The index goes from 0 to NumberOfEntities-1.

Lasterror is set.

Returns nil on any error.

16.2.4 NumberOfEntities as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the number of entities for this device.

Notes: Returns nil on any error.

Lasterror is set.

16.3 class MidiEndpointMBS

16.3.1 class MidiEndpointMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the CoreMidi classes.

Notes: Entities have any number of MIDIEndpointRef's, sources and destinations of 16-channel MIDI streams.

Subclass of the MidiObjectMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 12.5pr1](#)

16.3.2 Methods

16.3.3 close

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The destructor.

Notes: Frees the endpoint handle.

There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.3.4 Entity as MidiEntityMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns an endpoint's entity.

Notes: Returns nil on any error.

Lasterror is set.

New for CoreMIDI 1.3.

16.3.5 FlushOutput

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Unschedule previously-sent packets.

Notes: Clients may use MIDIFlushOutput to cancel the sending of packets that were previously scheduled for future delivery.

New for CoreMIDI 1.1.

Lasterror is set.

16.3.6 Received(packets as MidiPacketListMBS)

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: Distribute MIDI from a source to the client input ports which are connected to that source.

Notes: Drivers should call this function when receiving MIDI from a source.

Clients which have created virtual sources, using MIDICreateSource, should call this function when the source is generating MIDI.

Lasterror is set.

16.3.7 Events

16.3.8 Read(endpoint as MidiEndpointMBS, list as MidiPacketListMBS)

Plugin Version: 4.1, Platform: macOS, Targets: .

Function: Called when data arrives at an endpoint.

Notes: If more than 256 bytes of data is received, it may be splitted and send in several events.

For some devices a Note Off is just a Note On with a zero velocity.

16.4 class MidiEntityMBS

16.4.1 class MidiEntityMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the CoreMidi classes.

Notes: Devices may have multiple logically distinct sub-components, e.g. a MIDI synthesizer and a pair of MIDI ports, both addressable via a USB port.

By grouping a device's endpoints into entities, the system has enough information for an application to make reasonable assumptions about how to communicate in a bi-directional manner with each entity, as is desirable in MIDI librarian applications.

These sub-components are MIDIEntityRef's.
Subclass of the MidiObjectMBS class.

16.4.2 Methods

16.4.3 Device as MidiDeviceMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns an entity's device.

Notes: Returns nil on any error.

Lasterror is set.

New for CoreMIDI 1.3.

16.4.4 GetDestination(index as Integer) as MidiEndpointMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of a given entity's destinations.

Notes: Lasterror is set.

Returns nil on any error.

16.4.5 GetSource(index as Integer) as MidiEndpointMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return one of a given entity's sources.

Notes: Lasterror is set.
Returns nil on any error.

16.4.6 NumberOfDestinations as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return the number of destinations in a given entity.

Notes: Lasterror is set.
Returns 0 on any error.

16.4.7 NumberOfSources as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Return the number of sources in a given entity.

Notes: Lasterror is set.
Returns 0 on any error.

16.5 class MidiObjectMBS

16.5.1 class MidiObjectMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: A class for a Mac OS X CoreMidi object.

Blog Entries

- [MBS Xojo Plugins, version 24.1pr1](#)
- [MBS Xojo Plugins, version 17.4pr2](#)
- [MBS Real Studio Plugins, version 12.5pr2](#)

16.5.2 Methods

16.5.3 kMIDIPropertyAdvanceScheduleTimeMuSec as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, integer

Set by the owning driver; should not be touched by other clients.

If it is >0, then it is a recommendation of how many microseconds in advance clients should schedule output. Clients should treat this value as a minimum. For devices with a >0 advance schedule time, drivers will receive outgoing messages to the device at the time they are sent by the client, via MIDISend, and the driver is responsible for scheduling events to be played at the right times according to their timestamps.

As of CoreMIDI 1.3, this property may also be set on virtual destinations (but only the creator of the destination should do so).

When a client sends to a virtual destination with an advance schedule time of 0, the virtual destination receives its messages at their scheduled delivery time. If a virtual destination has a non-zero advance schedule time, it receives timestamped messages as soon as they are sent, and must do its own scheduling of the events.

16.5.4 kMIDIPropertyCanRoute as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.5 kMIDIPropertyConnectionUniqueID as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, integer or CFDataRef

UniqueID of an external device/entity/endpoint attached to this one (strongly recommended that it be an endpoint). This is for the use of a setup editor UI; not currently used internally. A driver-owned entity or endpoint has this property to refer to an external MIDI device that is connected to it.

The property is non-existent or 0 if there is no connection.

New for CoreMIDI 1.1.

Beginning with CoreMIDI 1.3, this property may be a CFDataRef containing an array of big-endian SInt32's, to allow specifying that a driver object connects to multiple external objects (via MIDI thru-ing or splitting).

This property may also exist for external devices/entities/endpoints, in which case it signifies a MIDI Thru connection to another external device/entity/endpoint (again, strongly recommended that it be an endpoint).

16.5.6 kMIDIPropertyDeviceID as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity property, integer

The entity's system-exclusive ID, in user-visible form

Drivers may set this property on their devices or entities.

Setup editors may allow the user to set this property on external devices.

16.5.7 kMIDIPropertyDisplayName as CFStringMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: device/entity/endpoint property, string.

Provides the Apple-recommended user-visible name for an endpoint, by combining the device and endpoint names.

For objects other than endpoints, the display name is the same as the name.

New for CoreMIDI 1.5.

16.5.8 kMIDIPropertyDriverDeviceEditorApp as CFStringMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: device property, string, contains the full path to an application which knows how to configure this driver-owned devices. Drivers may set this property on their owned devices. Applications must not write to it.

New for CoreMIDI 1.4.

16.5.9 kMIDIPropertyDriverOwner as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, string

Name of the driver that owns a device.

Set by the owning driver, on the device; should not be touched by other clients. Property is inherited from the device by its entities and endpoints.

New for CoreMIDI 1.1.

16.5.10 kMIDIPropertyDriverVersion as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, integer, returns the driver version API of the owning driver (only for driver-owned devices). Drivers need not set this property; applications should not write to it.

New for CoreMIDI 1.3.

16.5.11 kMIDIPropertyFactoryPatchNameFile as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, CFData containing AliasHandle

An alias to the device's current factory patch name file.

Added in CoreMIDI 1.1. DEPRECATED as of CoreMIDI 1.3.

Use kMIDIPropertyNameConfiguration instead.

16.5.12 kMIDIPropertyImage as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device property, CFStringRef which is a full POSIX path to a device or external device's icon, stored in any standard graphic file format such as JPEG, GIF, PNG and TIFF are all acceptable. (See CFURL for functions to convert between POSIX paths and other ways of specifying files.) The image's maximum size should be 128x128.

Drivers should set the icon on the devices they add.

A studio setup editor should allow the user to choose icons for external devices.

New for CoreMIDI 1.3.

16.5.13 kMIDIPropertyIsBroadcast as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

entity/endpoint property, integer

1 if the endpoint broadcasts messages to all of the other endpoints in the device, 0 if not. Set by the owning driver; should not be touched by other clients.

New for CoreMIDI 1.3.

16.5.14 kMIDIPropertyIsDrumMachine as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.15 kMIDIPropertyIsEffectUnit as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.16 kMIDIPropertyIsEmbeddedEntity as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

entity/endpoint property, integer

0 if there are external MIDI connectors, 1 if not.

New for CoreMIDI 1.1.

16.5.17 kMIDIPropertyIsMixer as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.18 kMIDIPropertyIsSampler as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.19 kMIDIPropertyManufacturer as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Example:

```
dim m as MidiClientMBS
```

```
dim i, n as Integer
```

```
dim e as MIDIEndpointMBS
```

```
dim d as MIDIDeviceMBS
```

```
dim s as CFStringMBS
```

```
m = new MidiClientMBS
```

```
m.Init NewCFStringMBS("Test")
```

```
d = m.GetDevice(0)
```

```
s = d.StringProperty(d.kMIDIPropertyManufacturer)
```

```
MsgBox s.str
```

Notes: Only available after you called the Init Method.

device/endpoint property, string

Drivers should set this property on their devices.
Setup editors may allow the user to set this property on external devices.
Creators of virtual endpoints may set this property on their endpoints.

16.5.20 kMIDIPropertyMaxReceiveChannels as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0-16

16.5.21 kMIDIPropertyMaxSysExSpeed as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, integer

Set by the owning driver; should not be touched by other clients.

maximum bytes/second of sysex messages sent to it

(default is 3125, as with MIDI 1.0)

16.5.22 kMIDIPropertyMaxTransmitChannels as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0-16

16.5.23 kMIDIPropertyModel as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/endpoint property, string

Drivers should set this property on their devices.

Setup editors may allow the user to set this property on external devices.

Creators of virtual endpoints may set this property on their endpoints.

16.5.24 kMIDIPropertyName as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Example:

```
// init midi
dim m as new MidiClientMBS
m.Init NewCFStringMBS("TestApp")

// create a source
dim name as CFStringMBS = NewCFStringMBS("TestSource")
dim source as MidiEndpointMBS = m.CreateSource(name)

// query name property
dim s as CFStringMBS = source.StringProperty(source.kMIDIPropertyName)
MsgBox "Name: " + s.str
```

Notes: Only available after you called the Init Method.

device/entity/endpoint property, string

Devices, entities, and endpoints may all have names. The recommended way to display an endpoint's name is to ask for the endpoint name, and display only that name if it is unique. If it is non-unique, prepend the device name.

A setup editor may allow the user to set the names of both driver-owned and external devices.

16.5.25 kMIDIPropertyNameConfiguration as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, CFDictionary

This specifies the device's current patch, note and control name values using the MIDINameDocument XML

format. This specification requires the use of higher-level, OS-specific constructs outside of the specification, to fully define the current names for a device.

The MIDINameConfiguration property is implemented as a CFDictionary:

key "master" maps to a CFDataRef containing an AliasHandle referring to the device's master name document.

key "banks" maps to a CFDictionaryRef. This dictionary's keys are CFStringRef names of patchBank elements in the master document, and its values are each a CFDictionaryRef: key "file" maps to a CFDataRef containing an AliasHandle to a document containing patches that override those in the master document, and key "patchNameList" maps to a CFStringRef which is the name of the patchNameList element in the overriding document.

key "currentModes" maps to a 16-element CFArrayRef, each element of which is a CFStringRef of the name of the current mode for each of the 16 MIDI channels.

Clients setting this property must take particular care to preserve dictionary values other than the ones they are interested in changing, and to properly structure the dictionary.

New for CoreMIDI 1.3.

16.5.26 kMIDIPropertyOffline as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, integer

1 = device is offline (is temporarily absent), 0 = present

Set by the owning driver, on the device; should not be touched by other clients. Property is inherited from the device by its entities and endpoints.

New for CoreMIDI 1.1.

16.5.27 kMIDIPropertyPanDisruptsStereo as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.28 kMIDIPropertyPrivate as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, integer

1 = endpoint is private, hidden from other clients.

May be set on a device or entity, but they will still appear in the API; only affects whether the owned endpoints are hidden.

New for CoreMIDI 1.3.

16.5.29 kMIDIPropertyReceiveChannels as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

endpoint property, integer

The value is a bitmap of channels on which the object receives, $(1 \ll 0) = \text{ch } 1 \dots (1 \ll 15) = \text{ch } 16$.

Drivers may set this property on their entities or endpoints.

Setup editors may allow the user to set this property on external endpoints.

Virtual destination may set this property on their endpoints.

16.5.30 kMIDIPropertyReceivesBankSelectLSB as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.31 kMIDIPropertyReceivesBankSelectMSB as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.32 kMIDIPropertyReceivesClock as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.33 kMIDIPropertyReceivesMTC as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.34 kMIDIPropertyReceivesNotes as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.35 `kMIDIPropertyReceivesProgramChanges` as `CFStringMBS`

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.36 `kMIDIPropertySingleRealtimeEntity` as `CFStringMBS`

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device property, integer

Some MIDI interfaces cannot route MIDI realtime messages to individual outputs; they are broadcast. On such devices the inverse is usually also true – incoming realtime messages cannot be identified as originating from any particular source.

When this property is set on a driver device, it signifies the 0-based index of the entity on which incoming realtime messages from the device will appear to have originated from.

New for CoreMIDI 1.3.

16.5.37 `kMIDIPropertySupportsGeneralMIDI` as `CFStringMBS`

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.38 kMIDIPropertySupportsMMC as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.39 kMIDIPropertySupportsShowControl as CFStringMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: device/entity property, integer (0/1). Indicates whether the device implements the MIDI.

New for CoreMIDI 1.5.

16.5.40 kMIDIPropertyTransmitChannels as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

endpoint property, integer

The value is a bitmap of channels on which the object transmits, (1«0)=ch 1...(1«15)=ch 16

New for CoreMIDI 1.3.

16.5.41 kMIDIPropertyTransmitsBankSelectLSB as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.42 kMIDIPropertyTransmitsBankSelectMSB as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.43 kMIDIPropertyTransmitsClock as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.44 kMIDIPropertyTransmitsMTC as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.45 kMIDIPropertyTransmitsNotes as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.46 kMIDIPropertyTransmitsProgramChanges as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is an integer property, 0/1

16.5.47 kMIDIPropertyUniqueID as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Example:

```
// init midi
dim m as new MidiClientMBS
m.Init NewCFStringMBS("TestApp")

// create a source
dim name as CFStringMBS = NewCFStringMBS("TestSource")
dim source as MidiEndpointMBS = m.CreateSource(name)

// query name property
dim s as Integer = source.IntegerProperty(source.kMIDIPropertyUniqueID)
MsgBox "UniqueID: "+str(s)
```

Notes: Only available after you called the Init Method.

devices, entities, endpoints all have unique ID's, integer

The system assigns unique ID's to all objects. Creators of virtual endpoints may set this property on their endpoints, though doing so may fail if the chosen ID is not unique.

16.5.48 kMIDIPropertyUserPatchNameFile as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: One of the properties for MIDI on Mac OS X.

Notes: Only available after you called the Init Method.

device/entity/endpoint property, CFData containing AliasHandle

An alias to the device's current user patch name file.

Added in CoreMIDI 1.1. DEPRECATED as of CoreMIDI 1.3.

Use kMIDIPropertyNameConfiguration instead.

16.5.49 Properties(deep as boolean) as CObjectMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Get all of an object's properties.

Notes: Deep parameter: true if the object's child objects are to be included (e.g. a device's entities, or an entity's endpoints).

Properties which an object inherits from its owning object (if any) are not included.

New for CoreMIDI 1.1.

Returns nil on any error.

Lasterror is set.

16.5.50 RemoveProperty(name as CFStringMBS)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Remove an object's property.

Notes: Lasterror is set.

16.5.51 Properties

16.5.52 DisplayName as String

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Provides the Apple-recommended user-visible name for an endpoint, by combining the device and endpoint names.

Notes: For objects other than endpoints, the display name is the same as the name.
(Read only property)

16.5.53 Handle as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The handle of this object.

Notes: (Read and Write property)

16.5.54 Lasterror as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The last error code reported.

Notes: 0 if the function was successful.

-1 if the function is not available or the RB parameters were bad. (e.g. nil)
else a Mac OS error code.

Some Midi specific error codes:

kMIDIInvalidClient	-10830	
kMIDIInvalidPort	-10831	
kMIDIWrongEndpointType	-10832	want source, got destination, or vice versa
kMIDINoConnection	-10833	attempt to close a non-existent connection
kMIDIUnknownEndpoint	-10834	
kMIDIUnknownProperty	-10835	
kMIDIWrongPropertyType	-10836	
kMIDINoCurrentSetup	-10837	there is no current setup, or it contains no devices
kMIDIMessageSendErr	-10838	communication with server failed
kMIDIserverStartErr	-10839	couldn't start the server
kMIDISetupFormatErr	-10840	unparseable saved state
kMIDIWrongThread	-10841	driver is calling non I/O function in server from a thread other than server's main one:
kMIDIObjectNotFound	-10842	
kMIDIIDNotUnique	-10843	

(Read and Write property)

16.5.55 Manufacturer as String

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: Drivers should set this property on their devices.

Notes: Setup editors may allow the user to set this property on external devices.

(Read only property)

16.5.56 Model as String

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The model name.

Notes: (Read only property)

16.5.57 Name as String

Plugin Version: 17.4, Platform: macOS, Targets: All.

Function: The item's name.

Notes: Devices, entities, and endpoints may all have names. The recommended way to display an endpoint's name is to ask for the endpoint name, and display only that name if it is unique. If it is non-unique, prepend the device name.

A setup editor may allow the user to set the names of both driver-owned and external devices.
(Read only property)

16.5.58 BinaryProperty(name as CFStringMBS) as CFBinaryDataMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Set or Get an object's data-type property.

Notes: Lasterror is set.

Returns nil on any error.

(Read and Write computed property)

16.5.59 IntegerProperty(name as CFStringMBS) as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Set or Get an object's integer-type property.

Example:

```
// init midi
dim m as new MidiClientMBS
m.Init NewCFStringMBS("TestApp")

// create a source
dim name as CFStringMBS = NewCFStringMBS("TestSource")
dim source as MidiEndpointMBS = m.CreateSource(name)

// query name property
dim s as Integer = source.IntegerProperty(source.kMIDIPropertyUniqueID)
MsgBox "UniqueID: "+str(s)

// set it
source.IntegerProperty(source.kMIDIPropertyUniqueID) = 1234

// query again
dim t as Integer = source.IntegerProperty(source.kMIDIPropertyUniqueID)
```

```
MsgBox "UniqueID: "+str(t)
```

Notes: Returns 0 on any error.
Lasterror is set.
(Read and Write computed property)

16.5.60 ObjectProperty(name as CFStringMBS) as CObjectMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Get or Set an object's dictionary-type property.

Notes: Lasterror is set.

New for CoreMIDI 1.3.

Renamed from Property to ObjectProperty in v4.3 for Xojo 6 compatibility.

(Read and Write computed property)

16.5.61 StringProperty(name as CFStringMBS) as CFStringMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Get or Set an object's string-type property.

Example:

```
dim m as MidiClientMBS
dim i, n as Integer
dim e as MIDIEndpointMBS
dim d as MIDIDeviceMBS
dim s as CFStringMBS
```

```
m = new MidiClientMBS
m.Init NewCFStringMBS("Test")
d = m.GetDevice(0)
```

```
s = d.StringProperty(d.kMIDIPropertyManufacturer)
```

```
MsgBox s.str
```

Notes: Lasterror is set.
(Read and Write computed property)

16.6 class MidiPacketListMBS

16.6.1 class MidiPacketListMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class to hold a list of MidiPackets.

16.6.2 Methods

16.6.3 FillList(packets() as MidiPacketMBS) as boolean

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Fills the list with the given Xojo array of MidiPackets.

Example:

```
Dim packs(-1) As MIDIPacketMBS
```

```
Dim pack As New MIDIPacketMBS
```

```
Dim list As New MIDIPacketListMBS
```

```
Dim data As New MemoryBlock(9)
```

```
data.Byte(0) = &hF0
```

```
data.Byte(1) = &h00
```

```
data.Byte(2) = &h20
```

```
data.Byte(3) = &h1C
```

```
data.Byte(4) = &h7F
```

```
data.Byte(5) = &h04
```

```
data.Byte(6) = &h02
```

```
data.Byte(7) = &h01
```

```
data.Byte(8) = &hF7
```

```
pack.datamemory = data
```

```
pack.timeStamp = Nil 'now
```

```
packs.append pack
```

```
If Not list.FillList(packs) Then
```

```
Break // problem
```

```
Else
```

```
// send to current port and destination
```

```
client.Send(outport, currentDest, list)
```

```
End If
```

16.6.4 Item(index as Integer) as MidiPacketMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Returns the item with the given index.

16.6.5 Properties

16.6.6 Count as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The number of items in the list.

Notes: (Read and Write property)

16.7 class MidiPacketMBS

16.7.1 class MidiPacketMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a midi packet.

Blog Entries

- [MBS Xojo Plugins, version 22.5pr1](#)
- [MBS Plugins 10.3 Release Notes](#)

16.7.2 Methods

16.7.3 AbsoluteToNanoseconds(value as UInt64) as UInt64

Plugin Version: 10.3, Platform: macOS, Targets: Desktop, Console & Web.

Function: Converts an absolute time value to a nanoseconds time value.

Example:

```
dim x as UInt64 = MidiPacketMBS.CurrentTime
```

```
dim y as UInt64 = x + MidiPacketMBS.NanosecondsToAbsolute(5)
```

```
MsgBox str(x)+" + 5 ns = "+str(Y)
```

16.7.4 CurrentTime as UInt64

Plugin Version: 10.3, Platform: macOS, Targets: All.

Function: Returns the current time of the computer as an absolute time value.

Example:

```
dim u as uint64 = MidiPacketMBS.CurrentTime
```

```
dim n as uint64 = MidiPacketMBS.AbsoluteToNanoseconds(u)
```

```
dim x as Double = n / 1000000000.0
```

```
MsgBox str(u)+" "+str(n)+" "+str(x)
```

```
dim d as new date
```

```
d.Minute = 0
```

```
d.Hour = 0
```

```
d.Second = 0
```

```
d.TotalSeconds = d.TotalSeconds + x
```

```
MsgBox d.ShortTime // how long the mac is running.
```

Notes: While some Macs do have host clock time being in nanoseconds, this is not guaranteed. So use the function `AbsoluteToNanoseconds` to convert to nanoseconds.

16.7.5 NanosecondsToAbsolute(value as UInt64) as UInt64

Plugin Version: 10.3, Platform: macOS, Targets: Desktop, Console & Web.

Function: Converts a nanoseconds value to an absolute time.

Example:

```
dim x as UInt64 = MidiPacketMBS.CurrentTime
```

```
dim y as UInt64 = MidiPacketMBS.NanosecondsToAbsolute(x)
```

```
dim seconds as uint64 = y / 1000000000
```

```
dim hours as uint64 = seconds / 3600
```

```
seconds = seconds - hours*3600
```

```
dim minutes as uint64 = seconds / 60
```

```
seconds = seconds - minutes*60
```

```
// shows how long the Mac is running:
```

```
MsgBox str(hours)+" hours, "+str(minutes)+" minutes, "+str(seconds)+" seconds"
```

16.7.6 Properties

16.7.7 DataMemory as MemoryBlock

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The data of the packet as a memoryblock.

Notes: Setting this value will automatically fill the `DataString` property, so both are in sync. (Read and Write property)

16.7.8 DataString as String

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The data of the packet as a string.

Notes: Setting this value will automatically fill the DataMemory property, so both are in sync.

This will not work:

```
DataSource="90 5A 7C"
```

But this is better:

```
DataSource=chr(&h90)+chr(&h5A)+chr(&h7C)
```

or with the DataMemory property:

```
m=newmemoryblock(3)
m.byte(0)=&h90
m.byte(1)=&h5A
m.byte(2)=&h7C
DataMemory=m
(Read and Write property)
```

16.7.9 TimeStamp as MemoryBlock

Plugin Version: 3.3, Platform: macOS, Targets: All.

Deprecated: This item is deprecated and should no longer be used. You can use TimeStampValue instead.

Function: The timestamp of the packet.

Example:

```
dim pack as MIDIPacketMBS
dim m as memoryblock

m=newmemoryblock(8)
m.Long(0) = 2345678 // some time value
m.Long(4) = 3456789
pack = new MIDIPacketMBS
pack.TimeStamp = m
```

Notes: A host clock time (64 bit value) representing the time of an event, as returned by MidiPacketMBS.CurrentTime.

As a convenience, you can use zero to use the current time.

And using nil for the memoryblock represents a value of zero (=now).

(Read and Write property)

16.7.10 TimeStampValue as UInt64

Plugin Version: 7.0, Platform: macOS, Targets: All.

Function: The timestamp of the packet.

Notes: A host clock time (64 bit value) representing the time of an event, as returned by `MidiPacketMBS.CurrentTime`.

As a convenience, you can use zero to use the current time.
(Read and Write property)

16.8 class MidiPortMBS

16.8.1 class MidiPortMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: A class for a MIDI port.

Notes: A MidiPortMBS, which may be an input port or output port, is an object through which a client may communicate with any number of MIDI sources or destinations.

Subclass of the MidiObjectMBS class.

Blog Entries

- [MBS Real Studio Plugins, version 12.5pr1](#)

16.8.2 Methods

16.8.3 close

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.8.4 ConnectSource(source as MidiEndpointMBS)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Establish a connection from a source to a client's input port.

Notes: Lasterror is set.

16.8.5 DisconnectSource(source as MidiEndpointMBS)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Close a previously-established source-to-input port connection.

Notes: Lasterror is set.

16.8.6 SetCallback(callback as Integer, reference as object)

Plugin Version: 6.0, Platform: macOS, Targets: All.

Function: Connects the MidiPort to send data to given MidiPlayback reference.

Example:

```
dim p as MidiPlaybackMBS
dim m as MidiPortMBS
// do something useful
m.SetCallback p.Callback, p
```

Notes: The method is to be used together with the Callback function in the MidiPlaybackMBS class. Read event is still being called if needed.

You can call again with 0 as callback to clear it.

16.8.7 Events

16.8.8 Read(endpoint as MidiEndpointMBS, list as MidiPacketListMBS)

Plugin Version: 3.3, Platform: macOS, Targets: .

Function: Called when data arrives at this port.

Notes: If more than 256 bytes of data is received, it may be splitted and send in several events.

For some devices a Note Off is just a Note On with a zero velocity.

16.9 class MIDISysexSendRequestMBS

16.9.1 class MIDISysexSendRequestMBS

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: An asynchronous request to send a single system-exclusive MIDI event to a MIDI destination.

Example:

```
// build a data package
Dim data As New MemoryBlock(9)

data.Byte(0) = &hF0
data.Byte(1) = &h00
data.Byte(2) = &h20
data.Byte(3) = &h1C
data.Byte(4) = &h7F
data.Byte(5) = &h04
data.Byte(6) = &h02
data.Byte(7) = &h01
data.Byte(8) = &hF7

// make new secon request
Dim sendRequest As New MIDISysexSendRequestMBS
sendRequest.Data = data
sendRequest.Destination = currentDest
sendRequest.Send

// store reference for later as send is asynchron
Window1.sendRequest = sendRequest
```

16.9.2 Methods

16.9.3 close

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.9.4 Send

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: Send a single system-exclusive event, asynchronously.

Notes: Keep a reference to this object until the call Completes.

16.9.5 Properties

16.9.6 BytesToSend as Integer

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: Initially set when sending starts to the number of bytes to be sent.

Notes: MIDISendSysex will decrement this counter as bytes are sent.
(Read and Write property)

16.9.7 Data as Memoryblock

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: The memoryblock with the data you want to send.

Notes: (Read and Write property)

16.9.8 Destination as MidiEndpointMBS

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: The endpoint to which the event is to be sent.

Notes: (Read and Write property)

16.9.9 IsComplete as boolean

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: The client may set this to true at any time to abort transmission.

Notes: The implementation sets this to true when all bytes have been sent.
Renamed from Complete to IsComplete in v4.3 for Xojo 6 compatibility.
(Read and Write property)

16.9.10 Lasterror as Integer

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: The last error code.

Notes: 0 for success.

(Read and Write property)

16.9.11 Length as Integer

Plugin Version: 3.4, Platform: macOS, Targets: All.

Function: The length of the memoryblock.

Notes: If 0, the memoryblock.size property is taken, but not all memoryblocks know their size.

(Read and Write property)

16.9.12 Events

16.9.13 Complete

Plugin Version: 3.4, Platform: macOS, Targets: .

Function: An event to notify the client of the completion of a call to MIDISendSysex.

16.10 class MidiThruConnectionControlTransformMBS

16.10.1 class MidiThruConnectionControlTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a control transformation midi connection.

Notes: Note: must order control transforms appropriately – first, filter out and remap. Further transforms can follow, and will apply to the remapped control number (if any).

N.B. All transformations are done using 14-bit control values, so, when doing an add/min/max transform on a 7-bit value, the parameter must be a 14-bit value, e.g. to add n, param must be n «7.

16.10.2 Properties

16.10.3 ControlNumber as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The control number.

Notes: (Read and Write property)

16.10.4 ControlType as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The control type.

Notes: implementation note: some code tests bits of these values

constants:

kMIDIControlType_7Bit	0	control numbers may be 0-127
kMIDIControlType_14Bit	1	control numbers may be 0-31
kMIDIControlType_7BitRPN	2	control numbers may be 0-16383
kMIDIControlType_14BitRPN	3	
kMIDIControlType_7BitNRPN	4	
kMIDIControlType_14BitNRPN	5	

(Read and Write property)

16.10.5 Parameter as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The parameter for the transformation.

Notes: (Read and Write property)

16.10.6 RemappedControlType as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The Remapped Control Type.

Notes: Only used when transform is kMIDITransform_MapControl
(Read and Write property)

16.10.7 Transform as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The transformation code to apply.

Notes: Some constants:

kMIDITransform_None	0	no param
kMIDITransform_FilterOut	1	filter out event type, no param
kMIDITransform_MapControl	2	param is remapped control number
kMIDITransform_Add	8	param is value to add
kMIDITransform_Scale	9	param is amount to scale by: fixed point bbbb.bbbb bbbb bbbb
kMIDITransform_MinValue	10	
kMIDITransform_MaxValue	11	
kMIDITransform_MapValue	12	param is index of map in connection's map array

(Read and Write property)

16.11 class MidiThruConnectionEndpointMBS

16.11.1 class MidiThruConnectionEndpointMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for an endpoint specifications.

Notes: When filling one of these out, clients can leave uniqueID 0 if the endpoint exists.

When when one is provided back to the client, the endpoint may be null if it doesn't exist, but the uniqueID will always be non-zero.

16.11.2 Methods

16.11.3 close

Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.11.4 Properties

16.11.5 Endpoint as MidiEndpointMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The endpoint to use for a connection.

Notes: (Read and Write property)

16.11.6 UniqueID as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: An unique ID for an endpoint.

Notes: (Read and Write property)

16.12 class MidiThruConnectionMBS

16.12.1 class MidiThruConnectionMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A class for a midi connection.

Notes: This class defines functions to create MIDI play-through connections between the MIDI sources and destinations. These connections may be persistent or transitory, owned by a client.

By using connections instead of doing MIDI Thru operations themselves, the overhead of moving MIDI messages between the server and the client for thru-ing is reduced.

The aim of these functions is to permit as flexible a set of transformations as possible while keeping the API and data structures relatively simple.

Subclass of the MidiObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 24.1pr1](#)
- [MBS Xojo Plugins, version 20.1pr4](#)
- [MBS Xojo Plugins, version 19.3pr5](#)

16.12.2 Methods

16.12.3 close

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.12.4 Create(PersistentOwnerID as CFStringMBS, params as MidiThruConnectionParamsMBS)

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Creates a new connection.

Notes: If inPersistentOwnerID is nil, then the connection is marked as owned by the client and will be automatically disposed with the client.

If it is non-nil, then it should be a unique identifier, e.g. "com.mycompany.MyCoolProgram".

16.12.5 Find(PersistentOwnerID as String) as MidiThruConnectionMBS()

Plugin Version: 24.1, Platform: macOS, Targets: All.

Function: Returns all of the persistent thru connections created by a client.

Notes: PersistentOwnerID: The ID of the owner whose connections are to be returned.

16.12.6 Properties

16.12.7 Parameter as MidiThruConnectionParamsMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The parameters for the connection.

Notes: Lasterror is set.

(Read and Write computed property)

16.13 class MidiThruConnectionParamsMBS

16.13.1 class MidiThruConnectionParamsMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The class for the parameters of a midi connection.

Blog Entries

- [News from the MBS Xojo Plugins Version 20.1](#)
- [MBS Xojo Plugins, version 20.1pr4](#)

16.13.2 Methods

16.13.3 close

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The destructor.

Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

16.13.4 Properties

16.13.5 ChannelPressure as MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the transformations.

Notes: (Read and Write property)

16.13.6 ControlTransformsCount as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The number of control transformations used.

Notes: If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries in the ControlTransform array.

(Read and Write property)

16.13.7 DestinationsCount as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The number of destinations.

Notes: If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries in the destination array.

(Read and Write property)

16.13.8 FilterOutAllControls as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Unknown.

Notes: (Read and Write property)

16.13.9 FilterOutBeatClock as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Unknown.

Notes: (Read and Write property)

16.13.10 FilterOutMTC as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Unknown.

Notes: (Read and Write property)

16.13.11 FilterOutSysEx as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Unknown.

Notes: (Read and Write property)

16.13.12 FilterOutTuneRequest as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: Unknown.

Notes: (Read and Write property)

16.13.13 HighNote as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The high note value.

Notes: Ignored if mapping.

If highNote < lowNote, then 0..highNote and lowNote..127 are passed.

(Read and Write property)

16.13.14 HighVelocity as Integer

Plugin Version: 20.1, Platform: macOS, Targets: All.

Function: Higher velocity limit.

Notes: Note events with a velocity greater than this, if it is not 0, are filtered out.

(Read and Write property)

16.13.15 KeyPressure as MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the transformations.

Notes: (Read and Write property)

16.13.16 LowNote as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The low note value.

Notes: Ignored if mapping.

If highNote < lowNote, then 0..highNote and lowNote..127 are passed.

(Read and Write property)

16.13.17 LowVelocity as Integer

Plugin Version: 20.1, Platform: macOS, Targets: All.

Function: Lower velocity limit.

Notes: Note events with a velocity less than this value are filtered out.
(Read and Write property)

16.13.18 MapsCount as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The number of mappings used.

Notes: If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries in the Map array.
(Read and Write property)

16.13.19 NoteNumber as MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the transformations.

Notes: (Read and Write property)

16.13.20 PitchBend as MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the transformations.

Notes: (Read and Write property)

16.13.21 ProgramChange as MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the transformations.

Notes: (Read and Write property)

16.13.22 SourcesCount as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The number of sources used.

Notes: If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries

in the Source array.
(Read and Write property)

16.13.23 Velocity as MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: One of the transformations.

Notes: (Read and Write property)

16.13.24 ChannelMap(index as Integer) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The array with the value mappings.

Notes: Map each of the source 16 MIDI channels to channel 0-15 (1-16) or 0xFF to filter out.

(Read and Write computed property)

16.13.25 ControlTransform(index as Integer) as MidiThruConnectionControlTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The array of control transformations.

Notes: (Read and Write computed property)

16.13.26 Destination(index as Integer) as MidiThruConnectionEndpointMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The array of destination endpoints.

Notes: (Read and Write computed property)

16.13.27 Map(index as Integer) as MidiThruConnectionValueMapMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The list of mappings for this midi connection.

Notes: Index is from 0 to 15.

(if you need more, send me an email and I upper the limit.)
(Read and Write computed property)

16.13.28 Source(index as Integer) as MidiThruConnectionEndpointMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The array of source endpoints.

Notes: (Read and Write computed property)

16.14 class MidiThruConnectionTransformMBS

16.14.1 class MidiThruConnectionTransformMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The class for a Midi connection transformation.

16.14.2 Properties

16.14.3 Parameter as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The parameter of the transformation.

Notes: (Read and Write property)

16.14.4 Transform as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The transformation code.

Notes: Some constants:

kMIDITransform_None	0	no param
kMIDITransform_FilterOut	1	filter out event type, no param
kMIDITransform_MapControl	2	param is remapped control number
kMIDITransform_Add	8	param is value to add
kMIDITransform_Scale	9	param is amount to scale by: fixed point bbbb.bbbb bbbb bbbb
kMIDITransform_MinValue	10	
kMIDITransform_MaxValue	11	
kMIDITransform_MapValue	12	param is index of map in connection's map array

(Read and Write property)

16.15 class MidiThruConnectionValueMapMBS

16.15.1 class MidiThruConnectionValueMapMBS

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: A value map for a Midi connection.

Notes: This is an array to map Midi values from 0 to 127 to new values from 0 to 127.

16.15.2 Properties

16.15.3 Value(index as Integer) as Integer

Plugin Version: 3.3, Platform: macOS, Targets: All.

Function: The value Map.

Notes: Index is from 0 to 127.

Use only values from 0 to 127.

(Read and Write computed property)

Chapter 17

Notifications

17.1 class NotificationCenterMBS

17.1.1 class NotificationCenterMBS

Platform: macOS, Targets: Desktop, Console & Web.

Function: A class for notifications sent on Mac OS X.

Notes: From Apple's help, but modified:

Distributed notifications allow an application to broadcast a message to any number of other applications without needing to know who those other applications are, or even if the other applications exist. Every application type—Cocoa, Carbon, BSD—can use distributed notifications.

An application, the target application in this case, expresses an interest in receiving a broadcasted message by registering itself with the system's distributed notification center, identifying exactly what message, or notification type, it wants to receive. The notification type is defined by an arbitrary string agreed upon by the sender and receiver of the notification. As an example, Cocoa's `NSWindow` class defines the notification type `"NSWindowDidCloseNotification"`, which an `NSWindow` instance broadcasts when its window closes. Any other object can register to receive this notification. (This notification, however, is internal to a single application and is not distributed to the rest of the system.)

In addition to the message, the application can identify the particular object sending the message. When the sender and receiver are in the same application—in other words, using nondistributed notifications—the observed object can be anything. When using distributed notifications, though, the object must be a string. A useful choice for the observed string is the bundle identifier of the target application.

In registering for the notification, the application provides a class with an `Receive` event, which will later be called.

Next, the broadcasting application —your preference pane —sends the notification. It calls the system’s notification center, tells the center what notification to send, and optionally passes a dictionary containing additional information. The dictionary can be used to pass the modified preferences directly to the application. Or, the preference pane can choose not to use the dictionary and instead write the changes out to disk. The notification is then used to tell the application to update its preferences from the disk.

The notification center looks up all the applications that registered to receive the given notification type from the particular instance. It then notifies each application’s run loop of the notification and gives it a copy of the dictionary. The selected callback function or method is executed during the application’s next pass through its run loop.

When using Preference Services, be certain to flush changes to the disk with the appropriate synchronize functions before sending notifications of changes. Otherwise, due to the caching performed by Preference Services, the disk may not accurately reflect the changes when the target receives the notification. Likewise, the target application must resynchronize its preferences after receiving the notification.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 15.0pr10](#)

17.1.2 Methods

17.1.3 Add(name as CFStringMBS, obj as CObjectMBS, flags as Integer)

Platform: macOS, Targets: Desktop, Console & Web.

Function: Adds a new callback.

Notes: This function costs around 24 bytes of memory per call which are never released (needed for the callback between framework and RB).

Values for the flags:

CFNotificationSuspensionBehaviorDrop	1	The server will not queue any notifications with this name and object while the process/app is in the background.
CFNotificationSuspensionBehaviorCoalesce	2	The server will only queue the last notification of the specified name and object; earlier notifications are dropped.
CFNotificationSuspensionBehaviorHold	3	The server will hold all matching notifications until the queue has been filled (queue size determined by the server) at which point the server may flush queued notifications.
CFNotificationSuspensionBehaviorDeliverImmediately	4	The server will deliver notifications matching this registration whether or not the process is in the background. When a notification with this suspension behavior is matched, it has the effect of first flushing any queued notifications.

17.1.4 close(name as CFStringMBS, obj as CObjectMBS)

Platform: macOS, Targets: Desktop, Console & Web.

Function: Closes the given callback.

17.1.5 closeAll

Platform: macOS, Targets: Desktop, Console & Web.

Function: Closes all registered callbacks.

Notes: This is called by the destructor.

17.1.6 Post(name as CFStringMBS, obj as CObjectMBS, userinfo as CFDictionaryMBS, deliverImmediately as Boolean)

Platform: macOS, Targets: Desktop, Console & Web.

Function: Posts a new notification.

Notes: Obj and userinfo may be nil.

See also:

- 17.1.7 Post(name as CFStringMBS, obj as CObjectMBS, userinfo as CFDictionaryMBS, options as Integer) 657

17.1.7 Post(name as CFStringMBS, obj as CObjectMBS, userinfo as CFDictionaryMBS, options as Integer)

Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

Function: Posts a new notification.

Example:

```
dim n as new NotificationCenterMBS
n.Post(NewCFStringMBS("test"), nil, nil, n.kCFNotificationPostToAllSessions + n.kCFNotificationDeliverImmediately)
```

Notes: Obj and userinfo may be nil.

Requires Mac OS X 10.3.

For options you can use a combination with kCFNotificationDeliverImmediately=1 and kCFNotificationPostToAllSessions=2.

See also:

- 17.1.6 Post(name as CFStringMBS, obj as CObjectMBS, userinfo as CFDictionaryMBS, deliverImmediately as Boolean) 657

17.1.8 Properties

17.1.9 Available as boolean

Platform: macOS, Targets: Desktop, Console & Web.

Function: Whether the needed framework was successful loaded.

Notes: (Read only property)

17.1.10 Events

17.1.11 Received(name as CFStringMBS, obj as CObjectMBS, userinfo as CFDictionaryMBS)

Platform: macOS, Targets: .

Function: A notification was received.

Notes: All parameters may be for any reason nil.

17.1.12 Constants

Constants

Constant	Value	Description
kCFNotificationDeliverImmediately	1	One of the constant you can use for the Post Method.
kCFNotificationPostToAllSessions	2	One of the constant you can use for the Post Method.

Chapter 18

Power

18.1 class IOPowerSourcesMBS

18.1.1 class IOPowerSourcesMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: A class to look on all the power sources on a Mac OS X based computer.

Example:

```
dim i as IOPowerSourcesMBS
dim j,n as Integer

i=new IOPowerSourcesMBS

n=i.Count-1
for j=0 to n
CFShowMBS i.Item(j) // Print battery info to console.
next
```

Notes: Requires Mac OS X.

Blog Entries

- [MBS Xojo Plugins, version 17.3pr3](#)
- [MBS Xojo / Real Studio Plugins, version 16.4pr9](#)

18.1.2 Methods

18.1.3 ExternalPowerAdapterDetails as CFDictionaryMBS

Plugin Version: 16.4, Platform: macOS, Targets: Desktop, Console & Web.

Function: Returns a CFDictionary that describes the attached (AC) external power adapter (if any external power adapter is attached).

Example:

```
dim d as CFDictionaryMBS = IOPowerSourcesMBS.ExternalPowerAdapterDetails
dim dic as Dictionary = d.Dictionary
```

```
dim lines() as string
lines.Append "AdapterRevision: "+dic.Lookup("AdapterRevision", "")
lines.Append "AdapterID: "+dic.Lookup("AdapterID", "")
lines.Append "FamilyCode: "+dic.Lookup("FamilyCode", "")
lines.Append "SerialNumber: "+dic.Lookup("SerialNumber", "")
lines.Append "Watts: "+dic.Lookup("Watts", "")
```

```
MsgBox Join(lines, EndOfLine)
```

Notes: Returns a CFDictionary on success.
If no adapter is attached, or if there's an error, returns nil.

18.1.4 Item(index as Integer) as CFDictionaryMBS

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Ask for the power source description with the given index.

Example:

```
dim i as new IOPowerSourcesMBS
i.Update
MsgBox i.Item(0).XML.Str // shows dictionary for first power source
```

Notes: Index is from 0 to count-1.

18.1.5 Update

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: Queries for new power sources and updates the item array.

Example:

```
dim i as new IOPowerSourcesMBS
i.Update
MsgBox str(i.Count)
```

18.1.6 Properties

18.1.7 Count as Integer

Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

Function: The number of registered power sources.

Example:

```
dim i as new IOPowerSourcesMBS
i.Update
MsgBox str(i.Count)
```

Notes: (Read only property)

18.1.8 Events

18.1.9 Changed

Plugin Version: 4.0, Platform: macOS, Targets: .

Function: The state of one power source changed.

Notes: Whenever something changes around the power sources, you are notified with this event.

Chapter 19

Process

19.1 class Application

19.1.1 class Application

Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: Extends the Application class inside Xojo.

19.1.2 Methods

19.1.3 MainBundleMBS as CFBundleMBS

Platform: macOS, Targets: Desktop only.

Function: If your application is a bundle, this function returns your own bundle.

Notes: Returns nil on any error.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

19.2 class ConsoleApplication

19.2.1 class ConsoleApplication

Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Console only.

Function: Extends the ConsoleApplication class inside Xojo.

19.2.2 Methods

19.2.3 MainBundleMBS as CFBundleMBS

Plugin Version: 19.4, Platform: macOS, Targets: Console only.

Function: If your application is a bundle, this function returns your own bundle.

Notes: Returns nil on any error.

For console application, returns the bundle referencing the console app file.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

19.3 class DarwinGroupListMBS

19.3.1 class DarwinGroupListMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The list of Groups on a Mac OS X system.

Example:

```
dim l as new DarwinGroupListMBS
MsgBox str(l.Count)+" groups"
```

19.3.2 Methods

19.3.3 CurrentEffectiveUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The effective user ID of the calling process.

Example:

```
dim l as new DarwinGroupListMBS
MsgBox str(l.CurrentEffectiveUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.3.4 CurrentGroupID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real group ID of the calling process.

Example:

```
dim l as new DarwinGroupListMBS
MsgBox "CurrentGroupID: "+str(l.CurrentGroupID)
```

Notes: The real group ID is specified at login time.

19.3.5 CurrentUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real user ID of the calling process.

Example:

```
dim l as new DarwinGroupListMBS
MsgBox "CurrentUserID: "+str(l.CurrentUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.3.6 Group(index as Integer) as DarwinGroupMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Returns the Group with the given index.

Example:

```
dim l as new DarwinGroupListMBS
dim c as Integer = l.Count-1
dim names(-1) as string
for i as Integer = 0 to c
dim g as DarwinGroupMBS = l.Group(i)
names.Append g.Name
next
MsgBox Join(names,EndOfLine)
```

19.3.7 Properties

19.3.8 Count as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The number of Groups on this Mac OS X system.

Example:

```
dim l as new DarwinGroupListMBS
MsgBox str(l.Count)+" groups"
```

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Notes: (Read only property)

19.4 class DarwinGroupMBS

19.4.1 class DarwinGroupMBS

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: A class with information about a Group on Mac OS X.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox g.Name
```

Blog Entries

- [MBS Xojo Plugins, version 19.4pr1](#)

19.4.2 Methods

19.4.3 CurrentEffectiveUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The effective user ID of the calling process.

Example:

```
dim g as new DarwinGroupMBS
MsgBox "CurrentEffectiveUserID: "+str(G.CurrentEffectiveUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.4.4 CurrentGroupID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real group ID of the calling process.

Example:

```
dim g as new DarwinGroupMBS
MsgBox "CurrentGroupID: "+str(G.CurrentGroupID)
```

Notes: The real group ID is specified at login time.

19.4.5 CurrentUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real user ID of the calling process.

Example:

```
dim g as new DarwinGroupMBS
MsgBox "CurrentUserID: "+str(G.CurrentUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.4.6 LoadGroupByID(Groupid as Integer)

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Fills the properties of this class with the values for the Group with the given ID.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox g.Name
```

19.4.7 LoadGroupName(name as string)

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: Fills the properties of this class with the values for the given Group.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupName "staff"
MsgBox g.Name
```

19.4.8 UserName(index as Integer) as string

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The Group ID of this Group.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
```

```
dim c as Integer = g.UserCount-1
for i as Integer = 0 to c
  MsgBox g.UserName(i)
next
```

19.4.9 Properties

19.4.10 GroupID as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The group ID of the Group.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox "GroupID: "+str(G.GroupID)
```

Notes: (Read only property)

19.4.11 Name as string

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The name of the Group.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox "Name: "+g.Name
```

Notes: (Read only property)

19.4.12 Password as string

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The password for this group.

Notes: (Read only property)

19.4.13 Ready as Boolean

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: whether the values in this class were filled correctly.

Notes: (Read only property)

19.4.14 UserCount as Integer

Plugin Version: 3.2, Platform: macOS, Targets: All.

Function: The number of users in this group.

Example:

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox "UserCount: "+str(G.UserCount)
```

Notes: (Read only property)

19.5 class DarwinResourceUsageMBS

19.5.1 class DarwinResourceUsageMBS

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: A class for information about resource utilization.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralMaxResidentSetSize)
```

Notes: For more information type "man getrusage" in the Mac OS X Terminal.

Blog Entries

- [MBS Xojo Plugins, version 17.1pr2](#)
- [MBS Xojo / Real Studio Plugins, version 15.3pr4](#)
- [MBS REALbasic Plugins, version 10.6pr9](#)
- [MBS REALbasic Plugins, version 10.6pr2](#)

19.5.2 Properties

19.5.3 BlockInputOperations as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of block input operations.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.BlockInputOperations)
```

Notes: (Read only property)

19.5.4 BlockOutputOperations as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of block output operations.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.BlockOutputOperations)
```

Notes: (Read only property)

19.5.5 IntegralMaxResidentSetSize as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Integral max resident set size.

Example:

```
dim u as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
dim t as new DarwinTaskInfoMBS
```

```
MsgBox "Application Resident Size: "+str(t.ResidentSize)+EndOfLine+__
"Application Virtual Size: "+str(t.VirtualSize)+EndOfLine+__
"Application Integral Max Resident Size: "+str(u.IntegralMaxResidentSetSize)
```

Notes: Maximum memory usage of this app.
(Read only property)

19.5.6 IntegralSharedTextMemorySize as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Integral shared text memory size.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralSharedTextMemorySize)
```

Notes: (Read only property)

19.5.7 IntegralUnsharedDataSize as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Integral unshared data size.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralUnsharedDataSize)
```

Notes: (Read only property)

19.5.8 IntegralUnsharedStackSize as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Integral unshared stack size.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralUnsharedStackSize)
```

Notes: (Read only property)

19.5.9 InvoluntaryContextSwitches as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of involuntary context switches.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.InvoluntaryContextSwitches)
```

Notes: (Read only property)

19.5.10 MessagesReceived as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of messages received.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.MessagesReceived)
```

Notes: (Read only property)

19.5.11 MessagesSent as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of messages sent.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.MessagesSent)
```

Notes: (Read only property)

19.5.12 PageFaults as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of page faults.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.PageFaults)
```

Notes: (Read only property)

19.5.13 PageReclaims as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of page reclaims.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.PageReclaims)
```

Notes: (Read only property)

19.5.14 SignalsReceived as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of signals received.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.SignalsReceived)
```

Notes: (Read only property)

19.5.15 Swaps as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of swaps.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.Swaps)
```

Notes: (Read only property)

19.5.16 SystemTimeUsed as Double

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Seconds of system time used.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.SystemTimeUsed)
```

Notes: (Read only property)

19.5.17 UserTimeUsed as Double

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Seconds of user time used.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.UserTimeUsed)
```

Notes: (Read only property)

19.5.18 VoluntaryContextSwitches as Int64

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Number of voluntary context switches.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.VoluntaryContextSwitches)
```

Notes: (Read only property)

19.6 class DarwinTaskInfoMBS

19.6.1 class DarwinTaskInfoMBS

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: A class for your applications memory/resource usage.

Example:

```
dim u as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
dim t as new DarwinTaskInfoMBS
```

```
MsgBox "Application Resident Size: "+str(t.ResidentSize)+EndOfLine+_
"Application Virtual Size: "+str(t.VirtualSize)+EndOfLine+_
"Application Integral Max Resident Size: "+str(u.IntegralMaxResidentSetSize)
```

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19.6.2 Methods

19.6.3 Update as boolean

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Updates the values and returns true on success.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.UserTime)
call d.Update
MsgBox str(d.UserTime)
```

Notes: The constructor updates the values on creation of the object.

19.6.4 Properties

19.6.5 ContextSwitches as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of context switches.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.ContextSwitches)
```

Notes: (Read and Write property)

19.6.6 COWFaults as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of copy-on-write faults.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.COWFaults)
```

Notes: (Read and Write property)

19.6.7 Faults as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of page faults.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.Faults)
```

Notes: (Read and Write property)

19.6.8 MessagesReceived as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of messages received.

Example:

```
dim d as new DarwinTaskInfoMBS
```

```
MsgBox str(d.MessagesReceived)
```

Notes: (Read and Write property)

19.6.9 MessagesSent as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of messages sent.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.MessagesSent)
```

Notes: (Read and Write property)

19.6.10 PageIns as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of actual pageins.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.PageIns)
```

Notes: (Read and Write property)

19.6.11 ResidentSize as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of resident pages.

Example:

```
dim d as DarwinTaskInfoMBS
```

```
d=new DarwinTaskInfoMBS
MsgBox "This application uses "+Format(d.ResidentSize,"0")+ " Bytes of physical memory."
```

Notes: (Read and Write property)

19.6.12 SuspendCount as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Suspend count for task.

Example:

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.SuspendCount)
```

Notes: (Read and Write property)

19.6.13 SystemCallsMach as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of mach system calls.

Example:

```
dim d as DarwinTaskInfoMBS

d=new DarwinTaskInfoMBS
```

```
MsgBox "This application has done so far "+Format(d.SystemCallsMach,"0")+ " system calls using the Mach Interface."
```

Notes: (Read and Write property)

19.6.14 SystemCallsUnix as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of unix system calls.

Example:

```
dim d as DarwinTaskInfoMBS
```

```
d=new DarwinTaskInfoMBS
```

```
MsgBox "This application has done so far "+Format(d.SystemCallsUnix,"0")+ " system calls using the Unix Interface."
```

Notes: (Read and Write property)

19.6.15 SystemTime as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Total system run time.

Example:

```
dim d as DarwinTaskInfoMBS
```

```
d=new DarwinTaskInfoMBS
```

```
MsgBox "This application has used so far "+Format(d.SystemTime,"0")+ " seconds of CPU time."
```

Notes: (Read and Write property)

19.6.16 UserTime as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Total user run time.

Example:

```
dim d as DarwinTaskInfoMBS
```

```
d=new DarwinTaskInfoMBS
```

```
MsgBox "This application has used so far "+Format(d.UserTime,"0")+ " seconds of CPU time."
```

Notes: (Read and Write property)

19.6.17 VirtualSize as Double

Plugin Version: 5.2, Platform: macOS, Targets: All.

Function: Number of virtual pages.

Example:

```
dim d as DarwinTaskInfoMBS
```

```
d=new DarwinTaskInfoMBS
```

```
MsgBox "This application uses "+Format(d.VirtualSize,"0")+ " Bytes of the 4 GB address space."
```

Notes: (Read and Write property)

19.7 class DarwinUserListMBS

19.7.1 class DarwinUserListMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The list of users on a Mac OS X system.

Example:

```
// find the short user name
dim d as DarwinUserListMBS
dim u as string
dim p as DarwinUserMBS
dim uid,i,c as Integer

// requires MachO target
declare function getuid lib "System" () as Integer

uid=getuid

d=new DarwinUserListMBS

c=d.Count-1
for I=0 to c
p=d.User(i)
if p.UserID=uid then
MsgBox p.Name
end if
next
```

19.7.2 Methods

19.7.3 CurrentEffectiveUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The effective user ID of the calling process.

Example:

```
dim l as new DarwinUserListMBS
MsgBox "CurrentEffectiveUserID: "+str(l.CurrentEffectiveUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to de-

termine the real-user-id of the calling process.

19.7.4 CurrentGroupID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real group ID of the calling process.

Example:

```
dim l as new DarwinUserListMBS
MsgBox "CurrentGroupID: "+str(l.CurrentGroupID)
```

Notes: The real group ID is specified at login time.

19.7.5 CurrentUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real user ID of the calling process.

Example:

```
dim l as new DarwinUserListMBS
MsgBox "CurrentUserID: "+str(l.CurrentUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.7.6 User(index as Integer) as DarwinUserMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Returns the user with the given index.

Example:

```
// find short user name
dim d as DarwinUserListMBS
dim u as string
dim p as DarwinUserMBS
dim uid,i,c as Integer
```

```
u=SystemInformationMBS.Username
d=new DarwinUserListMBS

c=d.Count-1
for I=0 to c
p=d.User(i)
if p.LongName=u then
MsgBox p.Name
end if
next
```

19.7.7 Properties

19.7.8 Count as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The number of users on this Mac OS X system.

Example:

```
dim l as new DarwinUserListMBS
MsgBox "Number of users: "+str(l.Count)
```

Notes: (Read only property)

19.8 class DarwinUserMBS

19.8.1 class DarwinUserMBS

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: A class with information about a user on Mac OS X.

Example:

```
dim l as new DarwinUserMBS
l.LoadUserByID l.CurrentUserID
MsgBox l.Name+"": "+l.LongName
```

19.8.2 Methods

19.8.3 CurrentEffectiveUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The effective user ID of the calling process.

Example:

```
dim l as new DarwinUserMBS
MsgBox str(l.CurrentEffectiveUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.8.4 CurrentGroupID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real group ID of the calling process.

Example:

```
dim l as new DarwinUserMBS
MsgBox str(l.CurrentGroupID)
```

Notes: The real group ID is specified at login time.

19.8.5 CurrentUserID as Integer

Plugin Version: 8.0, Platform: macOS, Targets: All.

Function: The real user ID of the calling process.

Example:

```
dim l as new DarwinUserMBS
MsgBox str(l.CurrentUserID)
```

Notes: The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, `getuid()` is used to determine the real-user-id of the calling process.

19.8.6 LoadUserByID(userid as Integer)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Fills the properties of this class with the values for the user with the given ID.

Example:

```
dim l as new DarwinUserMBS

l.LoadUserByID l.CurrentUserID

MsgBox l.Name
```

19.8.7 LoadUserByName(name as string)

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: Fills the properties of this class with the values for the given user.

Example:

```
dim l as new DarwinUserMBS

l.LoadUserByName "cs"

MsgBox l.LongName
```

19.8.8 Properties

19.8.9 AccountExpireTime as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The time when the account will expire.

Notes: (Read only property)

19.8.10 GroupID as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The group ID of the user.

Example:

```
dim l as new DarwinUserMBS
l.LoadUserByID l.CurrentUserID
MsgBox str(l.GroupID)
```

Notes: (Read only property)

19.8.11 HomePath as string

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The home path of the user.

Example:

```
dim l as new DarwinUserMBS

l.LoadUserByName "cs"

MsgBox l.HomePath
```

Notes: (Read only property)

19.8.12 LastPasswordChangeTime as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The last time when the user changed the password.

Notes: (Read only property)

19.8.13 LongName as string

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The long name of the user.

Example:

```
dim l as new DarwinUserMBS
```

```
l.LoadUserByName "cs"
```

```
MsgBox l.LongName
```

Notes: (Read only property)

19.8.14 Name as string

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The short name of the user.

Example:

```
dim l as new DarwinUserListMBS
```

```
dim c as Integer = l.Count-1
for i as Integer = 0 to c
dim u as DarwinUserMBS = l.User(i)
if u.UserID = l.CurrentUserID then
MsgBox "our user name: "+u.Name
end if
next
```

Notes: (Read only property)

19.8.15 Ready as Boolean

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: whether the values in this class were filled correctly.

Notes: (Read only property)

19.8.16 Shell as string

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The path to the default shell for this user.

Example:

```
dim l as new DarwinUserMBS
```

```
l.LoadUserByID l.CurrentUserID
```

```
MsgBox l.Shell
```

Notes: (Read only property)

19.8.17 UserID as Integer

Plugin Version: 3.1, Platform: macOS, Targets: All.

Function: The user ID of this user.

Example:

```
dim l as new DarwinUserMBS
```

```
l.LoadUserByID l.CurrentUserID
```

```
MsgBox str(l.UserID)
```

Notes: (Read only property)

19.9 class DarwinVMStatisticsMBS

19.9.1 class DarwinVMStatisticsMBS

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: Holds information about the current Mac OS X memory status.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.pageins)+" page ins"
```

19.9.2 Properties

19.9.3 ActivePages as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The total number of pages currently in use and pageable.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.ActivePages)
```

Notes: (Read only property)

19.9.4 CowFaults as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The number of faults that caused a page to be copied (generally caused by copy-on-write faults).

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CowFaults)
```

Notes: (Read only property)

19.9.5 CPUTicksIdle as Integer

Plugin Version: 2.7, Platform: macOS, Targets: All.

Function: The number of time slices used by the Idle process.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksIdle)
```

Notes: Calculate deltas like in the example to see usage of CPU time.
(Read only property)

19.9.6 CPUTicksNice as Integer

Plugin Version: 2.7, Platform: macOS, Targets: All.

Function: The number of time slices used by the task switcher process.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksNice)
```

Notes: Calculate deltas like in the example to see usage of CPU time.
(Read only property)

19.9.7 CPUTicksSystem as Integer

Plugin Version: 2.7, Platform: macOS, Targets: All.

Function: The number of time slices used by the system processes.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksSystem)
```

Notes: Calculate deltas like in the example to see usage of CPU time.
(Read only property)

19.9.8 CPUTicksUser as Integer

Plugin Version: 2.7, Platform: macOS, Targets: All.

Function: The number of time slices used by the user application processes.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksUser)
```

Notes: Calculate deltas like in the example to see usage of CPU time.
(Read only property)

19.9.9 Faults as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The number of times the "vm_fault" routine has been called.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Faults)
```

Notes: (Read only property)

19.9.10 FreePages as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The total number of free pages in the system.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.FreePages)
```

Notes: (Read only property)

19.9.11 Hits as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The hit count.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Hits)
```

Notes: (Read only property)

19.9.12 InactivePages as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The total number of pages on the inactive list.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.InactivePages)
```

Notes: (Read only property)

19.9.13 Lookups as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The count of lookups.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Lookups)
```

Notes: (Read only property)

19.9.14 PageIns as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The number of requests for pages from a pager (such as the inode pager).

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.pageins)
```

Notes: (Read only property)

19.9.15 PageOuts as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The number of pages that have been paged out.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.PageOuts)
```

Notes: (Read only property)

19.9.16 Pagesize as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The size of one memory page in memory.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Pagesize)
```

Notes: On PowerPC CPUs, it should be 4096 Bytes.
(Read only property)

19.9.17 Reactivations as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: the total number of pages that have been moved from the inactive list to the active list (reactivated).

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Reactivations)
```

Notes: (Read only property)

19.9.18 WiredPages as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The total number of pages wired down. That is, pages that cannot be paged out.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.WiredPages)
```

Notes: (Read only property)

19.9.19 ZeroFillPages as Integer

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: The total number of pages that have been zero-filled on demand.

Example:

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.ZeroFillPages)
```

Notes: (Read only property)

19.10 Globals

19.10.1 GetDarwinVMStatisticsMBS as DarwinVMStatisticsMBS

Plugin Version: 2.6, Platform: macOS, Targets: All.

Function: Returns information about the current memory status on Mac OS X.

Example:

```
dim d as DarwinVMStatisticsMBS

d=GetDarwinVMStatisticsMBS

if d=nil then
msgBox "No Darwin running :-(
quit
else
dim lines(-1) as string

lines.Append format(d.pageins,"0")+ " pageins"
lines.Append format(d.pageouts,"0")+ " pageouts"
lines.Append format(d.pagesize,"0")+ " pagesize"
lines.Append format(d.freepages,"0")+ " freepages"
lines.Append format(d.activepages,"0")+ " activepages"
lines.Append format(d.inactivepages,"0")+ " inactivepages"
lines.Append format(d.wiredpages,"0")+ " wiredpages"
lines.Append format(d.zerofillpages,"0")+ " zerofillpages"
lines.Append format(d.reactivations,"0")+ " reactivations"
lines.Append format(d.faults,"0")+ " faults"
lines.Append format(d.cowfaults,"0")+ " cowfaults"
lines.Append format(d.lookups,"0")+ " lookups"
lines.Append format(d.hits,"0")+ " hits"

MsgBox Join(lines,EndOfLine)
end if
```

19.10.2 GetDarwinResourceUsageMBS as DarwinResourceUsageMBS

Plugin Version: 4.1, Platform: macOS, Targets: All.

Function: Get information about resource utilization.

Example:

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralMaxResidentSetSize)
```

Notes: Returns nil on any error.

For more information type "man getrusage" in the Mac OS X Terminal.

19.11 class DesktopApplication

19.11.1 class DesktopApplication

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: Extends the Application class inside Xojo.

19.11.2 Methods

19.11.3 MainBundleMBS as CFBundleMBS

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

Function: If your application is a bundle, this function returns your own bundle.

Notes: Returns nil on any error.

Works for Console, Desktop and Web projects.

Chapter 20

System

20.1 Globals

20.1.1 GetMaximumOpenFileCountMacOSXMBS as Integer

Platforms: macOS, Linux, Targets: All.

Function: The number of simultan open files

Example:

```
msgbox str(GetMaximumOpenFileCountMacOSXMBS)
```

Notes: On Mac OS X per default a process can have 256 files open at the same time.

This function allows you to increase the number of open files. It seems that you can't have more than 10240 files open on Mac OS X.

Returns -2 if the function is not available and -1 if the current number of open files is unknown.

20.1.2 SetMaximumOpenFileCountMacOSXMBS(Value as Integer)

Platforms: macOS, Linux, Targets: All.

Function: The number of simultan open files

Example:

```
SetMaximumOpenFileCountMacOSXMBS 500
```

Notes: On Mac OS X per default a process can have 256 files open at the same time.

This function allows you to increase the number of open files. It seems that you can't have more than 10240 files open on Mac OS X.

20.1.3 SystemControlByNameMBS(name as string) as memoryblock

Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

Function: The SystemControlByNameMBS function retrieves system information and allows processes with appropriate privileges to set system information.

Example:

```
dim m1 as MemoryBlock = SystemControlByNameMBS("hw.physicalcpu")
dim m2 as MemoryBlock = SystemControlByNameMBS("hw.logicalcpu")
```

```
MsgBox "physicalcpu: "+str(m1.Long(0))+EndOfLine+"logicalcpu: "+str(m2.Long(0))
```

Notes: The name is given as an ASCII string.

Returns nil on any error.

See also:

- 20.1.4 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock 702

20.1.4 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock

Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

Function: The SystemControlByNameMBS function retrieves system information and allows processes with appropriate privileges to set system information.

Notes: The name is given as an ASCII string.

Returns nil on any error.

See also:

- 20.1.3 SystemControlByNameMBS(name as string) as memoryblock 702

20.1.5 SystemControlMBS(name as memoryblock) as memoryblock

Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

Function: The SystemControlMBS function retrieves system information and allows processes with appropriate privileges to set system information.

Example:

```

Function IsRosetta() As boolean
Const CTL_HW = 6
Const HW_MODEL = 2

dim mib,m as MemoryBlock

mib=newMemoryBlock(8)
mib.Long(0) = CTL_HW
mib.Long(4) = HW_MODEL

m=SystemControlMBS(mib)
if m<>nil then
if m.CString(0)="PowerMac" then
Return true
end if
end if
End Function

```

Notes: name is a MIB which can be constructed or queried with SystemControlNameToMIBMBS. Returns nil on any error.
See also:

- 20.1.6 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock 703

20.1.6 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock

Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

Function: The SystemControlMBS function retrieves system information and allows processes with appropriate privileges to set system information.

Notes: Returns nil on any error.

name is a MIB which can be constructed or queried with SystemControlNameToMIBMBS.

Xojo Developer Magazine

- [5.1, page 45: Detecting Rosetta, Are we running under emulation? by Christian Schmitz](#)

See also:

- 20.1.5 SystemControlMBS(name as memoryblock) as memoryblock 702

20.1.7 SystemControlNameToMIBMBS(name as string) as memoryblock

Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

Function: Searches the given MIB for the given name.

Notes: Name is an ASCII string.

Returns nil on any error.

Blog Entries

- [MBS Real Studio Plugins, version 13.1pr12](#)

Chapter 21

SystemConfiguration

21.1 class SCNetworkReachabilityMBS

21.1.1 class SCNetworkReachabilityMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: A class to check network reachability.

Notes: The SCNetworkReachability class allow an application to determine the status of a system's current network configuration and the reachability of a target host. In addition, the reachability can be monitored with a notification being provided when/if the status has changed.

The term "reachable" reflects whether a data packet, sent by an application into the network stack, can be sent to the the target host/address. Please note that there is no guarantee that the data packet will actually be received by the host.

Requires Mac OS X 10.3 or newer.
Subclass of the CObjectMBS class.

21.1.2 Methods

21.1.3 CreateWithAddress(ip as string) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Creates a reference to the specified network address.

Notes: Returns true on success.

21.1.4 CreateWithAddressPair(LocalIP as string, RemoteIP as string) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Creates a reference to the specified network address.

Notes: Returns true on success.

LocalIP: The local address associated with a network connection.

RemoteIP: The remote address associated with a network connection.

One of the IP addresses can be empty.

21.1.5 CreateWithName(name as string) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Creates a reference to the specified network host/node name.

Notes: Returns true on success.

21.1.6 ErrorString(errorcode as Integer) as string

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns an error string for a given SC Error Code.

Notes: A utility function which works at any time.

21.1.7 Properties

21.1.8 Error as Integer

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns the last error code.

Notes: A utility function which works with all SystemConfiguration methods.

(Read only property)

21.1.9 Flags as Integer

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Determines if the given target is reachable using the current network configuration.

Notes: Returns 0 on any error.

kSCStatusOK	= 0	Success
kSCStatusFailed	= 1001	Non-specific failure
kSCStatusInvalidArgument	= 1002	Invalid argument
kSCStatusAccessError	= 1003	Permission denied - must be root to obtain lock - could not create access/create preferences
kSCStatusNoKey	= 1004	No such key
kSCStatusKeyExists	= 1005	Key already defined
kSCStatusLocked	= 1006	Lock already held
kSCStatusNeedLock	= 1007	Lock required for this operation
kSCStatusNoStoreSession	= 2001	Configuration daemon session not active
kSCStatusNoStoreServer	= 2002	Configuration daemon not (no longer) available
kSCStatusNotifierActive	= 2003	Notifier is currently active
kSCStatusNoPrefsSession	= 3001	Preference session not active
kSCStatusPrefsBusy	= 3002	Preferences update currently in progress
kSCStatusNoConfigFile	= 3003	Configuration file not found
kSCStatusNoLink	= 3004	No such link
kSCStatusStale	= 3005	Write attempted on stale version of object
kSCStatusMaxLink	= 3006	Maximum link count exceeded
kSCStatusReachabilityUnknown	= 4001	Network reachability cannot be determined

See the event for the flag constants.
(Read only property)

21.1.10 Events

21.1.11 Changed(flags as Integer)

Plugin Version: 4.2, Platform: macOS, Targets: .

Function: The reachability changed.

Notes: useful constants:

kSCNetworkFlagsTransientConnection	= 1
kSCNetworkFlagsReachable	= 2
kSCNetworkFlagsConnectionRequired	= 4
kSCNetworkFlagsConnectionAutomatic	= 8
kSCNetworkFlagsInterventionRequired	= 5
kSCNetworkFlagsIsLocalAddress	= 65536
kSCNetworkFlagsIsDirect	= 131072

Flags that indicate whether the specified network nodename/address is reachable, requires a connection, requires some user intervention in establishing the connection, and whether the calling application must initiate the connection using the (TBD???) API.

kSCNetworkFlagsTransientConnection

This flag indicates that the specified nodename/address can be reached via a transient (e.g. PPP) connection.

kSCNetworkFlagsReachable

This flag indicates that the specified nodename/address can be reached using the current network configuration.

kSCNetworkFlagsConnectionRequired

This flag indicates that the specified nodename/address can be reached using the current network configuration but a connection must first be established.

As an example, this status would be returned for a dialup connection that was not currently active but could handle network traffic for the target system.

kSCNetworkFlagsConnectionAutomatic

This flag indicates that the specified nodename/address can be reached using the current network configuration but a connection must first be established. Any traffic directed to the specified name/address will initiate the connection.

kSCNetworkFlagsInterventionRequired

This flag indicates that the specified nodename/address can be reached using the current network configuration but a connection must first be established. In addition, some form of user intervention will be required to establish this connection (e.g. providing a password, authentication token, etc.).

kSCNetworkFlagsIsLocalAddress

This flag indicates that the specified nodename/address is one associated with a network interface on the current system.

kSCNetworkFlagsIsDirect

This flag indicates that network traffic to the specified nodename/address will not go through a gateway but is routed directly to one of the interfaces in the system.

21.2 class SCPreferencesMBS

21.2.1 class SCPreferencesMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: A class for System Configuration Preferences.

Notes: Please remember that you may need root access to change something.

The SCPreferences classes allow an application to load and store XML configuration data in a controlled manner and provide the necessary notifications to other applications that need to be aware of configuration changes.

The stored XML configuration data is accessed using a prefsID. A nil value indicates that the default system preferences are to be accessed.

A string which starts with a leading "/" character specifies the path to the file containing the preferences to be accessed. A string which does not start with a leading "/" character specifies a file relative to the default system preferences directory.

The Path APIs make certain assumptions about the layout of the preferences data. These APIs view the data as a collection of dictionaries of key/value pairs and an associated path name. The root ("/") identifies the top-level dictionary. Additional path components specify the keys for sub-dictionaries.

For example, the following dictionary can be accessed via two paths. The root ("/") path would return a dictionary with all keys and values. The path "/path1" would only return the dictionary with the "key3" and "key4" properties.

```
<dict>
<key>key1</key>
<string>val1</string>
<key>key2</key>
<string>val2</string>
<key>path1</key>
<dict>
<key>key3</key>
<string>val3</string>
<key>key4</key>
<string>val4</string>
</dict>
</dict>
```

Each dictionary can also include the kSCResvLink key. The value associated with this key is interpreted as a "link" to another path. If this key is present, a call to the GetPathValue() API will return the dictionary specified by the link.

Subclass of the CObjectMBS class.

Blog Entries

- [MBS Xojo Plugins, version 20.5pr4](#)
- [MBS Real Studio Plugins, version 12.5pr7](#)

21.2.2 Methods

21.2.3 AddValue(key as CFStringMBS, value as CObjectMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Adds data for a preference key.

Notes: This function associates new data with the specified key. In order to commit these changes to permanent storage a call must be made to CommitChanges.

Returns true if the value was added; false if the key already exists or if an error occurred.

21.2.4 ApplyChanges as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Requests that the currently stored configuration preferences be applied to the active configuration.

Notes: Returns true if the lock was obtained; false if an error occurred.

21.2.5 CommitChanges as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Commits changes made to the configuration preferences to persistent storage.

Notes: This function commits any changes to permanent storage. An implicit call to Lock/Unlock will be made if exclusive access has not already been established.

Note: This routine commits changes to persistent storage. Call ApplyChanges to apply the changes to the running system.

Returns true if the lock was obtained; false if an error occurred.

21.2.6 Create(name as CFStringMBS, prefid as CFStringMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Initiates access to the per-system set of configuration preferences.

Notes: name: A string that describes the name of the calling process.

prefID: A string that identifies the name of the group of preferences to be accessed/updated.

21.2.7 CreateUniquePathChild(prefix as CFStringMBS) as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Creates a new path component within the dictionary hierarchy.

Notes: prefix: A string that represents the parent path.

Returns a string representing the new (unique) child path; nil if the specified path does not exist.

21.2.8 CreateWithAuthorization(name as CFStringMBS, prefid as CFStringMBS, AuthorizationHandle as Integer) as boolean

Plugin Version: 12.5, Platform: macOS, Targets: All.

Function: Initiates access to the per-system set of configuration preferences.

Notes: name: A string that describes the name of the calling process.

prefID: A string that identifies the name of the group of preferences to be accessed/updated.

AuthorizationHandle: Handle to authorization object for root access.

21.2.9 ErrorString(errorcode as Integer) as string

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns an error string for a given SC Error Code.

Notes: A utility function which works at any time.

21.2.10 GetPathLink(path as CFStringMBS) as CObjectMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns the link (if one exists) associated with the specified path.

Notes: path: A string that represents the path to be returned.

The dictionary associated with the specified path; nil if the path is not a link or does not exist.

21.2.11 GetPathValue(path as CFStringMBS) as CFDictionaryMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns the dictionary associated with the specified path.

Notes: path: A string that represents the path to be returned.

Returns the dictionary associated with the specified path; nil if the path does not exist.

21.2.12 GetValue(key as CFStringMBS) as CObjectMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns the data associated with a preference key.

Notes: This function retrieves data associated with a key for the prefsID.

You could read stale data and not know it, unless you first call Lock.

Returns the value associated with the specified preference key; If no value was located, nil is returned.

21.2.13 KeyList as CFArrayMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns an array of currently defined preference keys.

Notes: Returns nil on any error.

21.2.14 Lock(wait as boolean) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Locks access to the configuration preferences.

Notes: This function obtains exclusive access to the configuration preferences associated with this prefsID. Clients attempting to obtain exclusive access to the preferences will either receive an kSCStatusPrefsBusy error or block waiting for the lock to be released.

wait: A boolean flag indicating whether the calling process should block waiting for another process to complete its update operation and release its lock.

Returns true if the lock was obtained; false if an error occurred.

21.2.15 RemovePathValue(path as CFStringMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Removes the data associated with the specified path.

Notes: path: A string that represents the path to be returned.

Returns a boolean indicating the success (or failure) of the call.

21.2.16 RemoveValue(key as CFStringMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Removes the data associated with a preference key.

Notes: This function removes the data associated with the specified key. In order to commit these changes to permanent storage a call must be made to CommitChanges.

Returns true if the value was removed; false if the key did not exist or if an error occurred.

21.2.17 SetComputerName(name as CFStringMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Updates the computer/host name in the system preferences.

Notes: In order to commit these changes to permanent storage a call must be made to CommitChanges.

A call to ApplyChanges is also required for the new name to become active.

A boolean indicating the success (or failure) of the call.

21.2.18 SetLocalHostName(name as CFStringMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Updates the local host name in the system preferences.

Notes: In order to commit these changes to permanent storage a call must be made to CommitChanges.

A call to ApplyChanges is also required for the new name to become active.

21.2.19 SetPathLink(path as CFStringMBS, link as CFObjectMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Associates a link to a second dictionary at the specified path.

Notes: path: A string that represents the path to be updated.

link: A string that represents the link to be stored at the specified path.

Returns a boolean indicating the success (or failure) of the call.

21.2.20 SetPathValue(path as CFStringMBS, value as CFDictionaryMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Associates a dictionary with the specified path.

Notes: path: A string that represents the path to be updated.

value: A dictionary that represents the data to be stored at the specified path.

Returns a boolean indicating the success (or failure) of the call.

21.2.21 SetValue(key as CFStringMBS, value as CObjectMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Updates the data associated with a preference key.

Notes: This function adds or replaces the value associated with the specified key. In order to commit these changes to permanent storage a call must be made to CommitChanges.

Returns true if the value was set; false if an error occurred.

21.2.22 Signature as CFBinaryDataMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns a sequence of bytes that can be used to determine if the saved configuration preferences have changed.

Notes: A CFBinaryDataMBS that reflects the signature of the configuration preferences at the time of the call to Create.

21.2.23 Unlock as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Releases exclusive access to the configuration preferences.

Notes: This function releases the exclusive access "lock" for this prefsID. Other clients will be now be able

to establish exclusive access to the preferences.

Returns true if the lock was obtained; false if an error occurred.

21.2.24 Properties

21.2.25 Available as Boolean

Plugin Version: 20.5, Platform: macOS, Targets: All.

Function: Whether this class is available.

Notes: Returns true on macOS.

(Read only property)

21.2.26 Error as Integer

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Returns the last error code.

Notes: A utility function which works with all SystemConfiguration methods.

kSCStatusOK	= 0	Success
kSCStatusFailed	= 1001	Non-specific failure
kSCStatusInvalidArgument	= 1002	Invalid argument
kSCStatusAccessError	= 1003	Permission denied - must be root to obtain lock - could not create access/create preferences
kSCStatusNoKey	= 1004	No such key
kSCStatusKeyExists	= 1005	Key already defined
kSCStatusLocked	= 1006	Lock already held
kSCStatusNeedLock	= 1007	Lock required for this operation
kSCStatusNoStoreSession	= 2001	Configuration daemon session not active
kSCStatusNoStoreServer	= 2002	Configuration daemon not (no longer) available
kSCStatusNotifierActive	= 2003	Notifier is currently active
kSCStatusNoPrefsSession	= 3001	Preference session not active
kSCStatusPrefsBusy	= 3002	Preferences update currently in progress
kSCStatusNoConfigFile	= 3003	Configuration file not found
kSCStatusNoLink	= 3004	No such link
kSCStatusStale	= 3005	Write attempted on stale version of object
kSCStatusMaxLink	= 3006	Maximum link count exceeded
kSCStatusReachabilityUnknown	= 4001	Network reachability cannot be determined

(Read only property)

21.3 Globals

21.3.1 kSCNetworkReachabilityMBSTypeID as Integer

Plugin Version: 12.4, Platform: macOS, Targets: All.

Function: Returns the CoreFoundation TypeID for SCNetworkReachability.

21.3.2 kSCPreferencesMBSTypeID as Integer

Plugin Version: 12.4, Platform: macOS, Targets: All.

Function: Returns the CoreFoundation TypeID for SCPreferences.

21.4 class SystemConfigurationMBS

21.4.1 class SystemConfigurationMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: A class for the global System Configuration framework functions.

Notes: See the file "SCSchemaDefinitions.h" for details on the constants.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 17.1pr1](#)
- [Need Proxy Settings?](#)

21.4.2 Methods

21.4.3 ComputerName as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: Gets the current computer name.

Example:

```
dim s as new SystemConfigurationMBS
msgbox s.ComputerName
```

Notes: Returns "" on an error.

21.4.4 ComputerNameEncoding as Integer

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: The encoding of the computer name.

21.4.5 ConsoleUser as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: Gets the name of the currently logged-in user.

Example:

```
dim s as new SystemConfigurationMBS
msgbox s.ConsoleUser
```

Notes: Returns the user currently logged into the system; "" if no user is logged in or if an error was encountered.

21.4.6 ConsoleUserGID as Integer

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: Gets the group ID of the currently logged-in user.

Notes: The group ID of the current console user.

21.4.7 ConsoleUserUID as Integer

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: Gets the user ID of the currently logged-in user.

Notes: The user ID of the current console user.

21.4.8 kSCCompAnyRegex as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.9 kSCCompGlobal as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.10 kSCCompHostNames as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.11 kSCCompInterface as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.12 kSCCompNetwork as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.13 kSCCompService as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.14 kSCCompSystem as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.15 kSCCompUsers as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.16 kSCDynamicStoreDomainFile as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.17 kSCDynamicStoreDomainPlugin as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.18 kSCDynamicStoreDomainPrefs as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.19 kSCDynamicStoreDomainSetup as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.20 kSCDynamicStoreDomainState as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.21 kSCDynamicStorePropNetInterfaces as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.22 kSCDynamicStorePropNetPrimaryInterface as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.23 kSCDynamicStorePropNetPrimaryService as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.24 kSCDynamicStorePropNetServiceIDs as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.25 kSCDynamicStorePropSetupCurrentSet as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.26 kSCDynamicStorePropSetupLastUpdated as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.27 kSCEntNet6to4 as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.28 kSCEntNetAirPort as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.29 kSCEntNetDHCP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.30 kSCEntNetDNS as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.31 kSCEntNetEthernet as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.32 kSCEntNetFireWire as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.33 kSCEntNetInterface as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.34 kSCEntNetIPv4 as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.35 kSCEntNetIPv6 as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.36 kSCEntNetL2TP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.37 kSCEntNetLink as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.38 kSCEntNetModem as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.39 kSCEntNetPPP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.40 kSCEntNetPPPoE as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.41 kSCEntNetPPPSerial as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.42 kSCEntNetPPTP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.43 kSCEntNetProxies as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.44 kSCEntUsersConsoleUser as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.45 kSCPrefCurrentSet as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.46 kSCPrefNetworkServices as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.47 kSCPrefSets as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.48 kSCPrefSystem as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.49 kSCPropInterfaceName as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.50 kSCPropMACAddress as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.51 kSCPropNet6to4Relay as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.52 kSCPropNetAirPortAllowNetCreation as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.53 kSCPropNetAirPortAuthPassword as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.54 kSCPropNetAirPortAuthPasswordEncryption as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.55 kSCPropNetAirPortJoinMode as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.56 kSCPropNetAirPortPowerEnabled as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.57 kSCPropNetAirPortPreferredNetwork as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.58 kSCPropNetAirPortSavePasswords as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.59 kSCPropNetDNSDomainName as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.60 kSCPropNetDNSSearchDomains as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.61 kSCPropNetDNSServerAddresses as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.62 kSCPropNetDNSSortList as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.63 kSCPropNetEthernetMediaOptions as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.64 kSCPropNetEthernetMediaSubType as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.65 kSCPropNetEthernetMTU as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.66 kSCPropNetInterfaceDeviceName as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.67 kSCPropNetInterfaceHardware as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.68 kSCPropNetInterfaces as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.69 kSCPropNetInterfaceSubType as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.70 kSCPropNetInterfaceSupportsModemOnHold as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.71 kSCPropNetInterfaceType as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.72 kSCPropNetIPv4Addresses as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.73 kSCPropNetIPv4BroadcastAddresses as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.74 kSCPropNetIPv4ConfigMethod as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.75 kSCPropNetIPv4DestAddresses as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.76 kSCPropNetIPv4DHCPClientID as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.77 kSCPropNetIPv4Router as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.78 kSCPropNetIPv4SubnetMasks as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.79 kSCPropNetIPv6Addresses as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.80 kSCPropNetIPv6ConfigMethod as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.81 kSCPropNetIPv6DestAddresses as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.82 kSCPropNetIPv6Flags as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.83 kSCPropNetIPv6PrefixLength as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.84 kSCPropNetIPv6Router as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.85 kSCPropNetL2TPIPecSharedSecret as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.86 kSCPropNetL2TPIPecSharedSecretEncryption as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.87 kSCPropNetL2TPTransport as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.88 kSCPropNetLinkActive as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.89 kSCPropNetLinkDetaching as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.90 kSCPropNetLocalHostName as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.91 kSCPropNetModemConnectionScript as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.92 kSCPropNetModemConnectSpeed as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.93 kSCPropNetModemDataCompression as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.94 kSCPropNetModemDialMode as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.95 kSCPropNetModemErrorCorrection as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.96 kSCPropNetModemHoldCallWaitingAudibleAlert as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.97 kSCPropNetModemHoldDisconnectOnAnswer as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.98 kSCPropNetModemHoldEnabled as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.99 kSCPropNetModemHoldReminder as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.100 kSCPropNetModemHoldReminderTime as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.101 kSCPropNetModemNote as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.102 kSCPropNetModemPulseDial as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.103 kSCPropNetModemSpeaker as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.104 kSCPropNetModemSpeed as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.105 kSCPropNetOverridePrimary as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.106 kSCPropNetPPPAcSPEnabled as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.107 kSCPropNetPPPAuthEAPPlugins as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.108 kSCPropNetPPPAuthName as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.109 kSCPropNetPPPAuthPassword as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.110 kSCPropNetPPPAuthPasswordEncryption as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.111 kSCPropNetPPPAuthPrompt as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.112 kSCPropNetPPPAuthProtocol as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.113 kSCPropNetPPPCCPEnabled as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.114 kSCPropNetPPPCommAlternateRemoteAddress as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.115 kSCPropNetPPPCommConnectDelay as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.116 kSCPropNetPPPCommDisplayTerminalWindow as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.117 kSCPropNetPPPCommRedialCount as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.118 kSCPropNetPPPCommRedialEnabled as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.119 kSCPropNetPPPCommRedialInterval as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.120 kSCPropNetPPPCommRemoteAddress as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.121 kSCPropNetPPPCommTerminalScript as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.122 kSCPropNetPPPCommUseTerminalScript as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.123 kSCPropNetPPPConnectTime as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.124 kSCPropNetPPPDeviceLastCause as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.125 kSCPropNetPPPDialOnDemand as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.126 kSCPropNetPPPDisconnectOnIdle as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.127 kSCPropNetPPPDisconnectOnIdleTimer as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.128 kSCPropNetPPPDisconnectOnLogout as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.129 kSCPropNetPPPDisconnectOnSleep as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.130 kSCPropNetPPPDisconnectTime as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.131 kSCPropNetPPPIdleReminder as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.132 kSCPropNetPPPIdleReminderTimer as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.133 kSCPropNetPPIPCPCCompressionVJ as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.134 kSCPropNetPPPLastCause as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.135 kSCPropNetPPPLCPCCompressionACField as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.136 kSCPropNetPPPLCPCCompressionPField as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.137 kSCPropNetPPPLCPEchoEnabled as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.138 kSCPropNetPPPLCPEchoFailure as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

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Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.140 kSCPropNetPPPLCPMRU as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.141 kSCPropNetPPPLCPMTU as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.142 kSCPropNetPPPLCPReceiveACCM as CFStringMBS

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21.4.143 kSCPropNetPPPLCPTransmitACCM as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

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Function: Just a constant for the System Configuration API functions.

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Function: Just a constant for the System Configuration API functions.

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Function: Just a constant for the System Configuration API functions.

21.4.154 kSCPropNetProxiesFTPPassive as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

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Function: Just a constant for the System Configuration API functions.

21.4.160 kSCPropNetProxiesHTTPEnable as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.161 kSCPropNetProxiesHTTPPort as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.162 kSCPropNetProxiesHTTPProxy as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

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21.4.163 kSCPropNetProxiesHTTPSEnable as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.164 kSCPropNetProxiesHTTPSPort as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.165 kSCPropNetProxiesHTTPSProxy as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.166 kSCPropNetProxiesRTSPEnable as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.167 kSCPropNetProxiesRTSPPort as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

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Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

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21.4.172 kSCPropNetServiceOrder as CFStringMBS

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21.4.173 kSCPropSystemComputerName as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.174 kSCPropSystemComputerNameEncoding as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.175 kSCPropUserDefinedName as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.176 kSCPropVersion as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.177 kSCResvInactive as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

Notes: Value should be "___INACTIVE___"

21.4.178 kSCResvLink as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

Notes: Value should be "___LINK___"

21.4.179 kSCValNetAirPortAuthPasswordEncryptionKeychain as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.180 kSCValNetAirPortJoinModeAutomatic as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.181 kSCValNetAirPortJoinModePreferred as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.182 kSCValNetAirPortJoinModeRecent as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.183 kSCValNetAirPortJoinModeStrongest as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.184 kSCValNetInterfaceSubTypeL2TP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

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Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.186 kSCValNetInterfaceSubTypePPPSerial as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.187 kSCValNetInterfaceSubTypePPTP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.188 kSCValNetInterfaceType6to4 as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.189 kSCValNetInterfaceTypeEthernet as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.190 kSCValNetInterfaceTypeFireWire as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.191 kSCValNetInterfaceTypePPP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.192 kSCValNetIPv4ConfigMethodBOOTP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.193 kSCValNetIPv4ConfigMethodDHCP as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.194 kSCValNetIPv4ConfigMethodINFORM as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.195 kSCValNetIPv4ConfigMethodLinkLocal as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.196 kSCValNetIPv4ConfigMethodManual as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.197 kSCValNetIPv4ConfigMethodPPP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.198 kSCValNetIPv6ConfigMethod6to4 as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.199 kSCValNetIPv6ConfigMethodAutomatic as CFStringMBS

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Function: Just a constant for the System Configuration API functions.

21.4.200 kSCValNetIPv6ConfigMethodManual as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.201 kSCValNetIPv6ConfigMethodRouterAdvertisement as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.202 kSCValNetL2TPIPsecSharedSecretEncryptionKeychain as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.203 kSCValNetL2TPTransportIP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.204 kSCValNetL2TPTransportIPSec as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.205 kSCValNetModemDialModeIgnoreDialTone as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.206 kSCValNetModemDialModeManual as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.207 kSCValNetModemDialModeWaitForDialTone as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.208 kSCValNetPPPAuthPasswordEncryptionKeychain as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.209 kSCValNetPPPAuthPromptAfter as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.210 kSCValNetPPPAuthPromptBefore as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.211 kSCValNetPPPAuthProtocolCHAP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.212 kSCValNetPPPAuthProtocolEAP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.213 kSCValNetPPPAuthProtocolMSCHAP1 as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.214 kSCValNetPPPAuthProtocolMSCHAP2 as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.215 kSCValNetPPPAuthProtocolPAP as CFStringMBS

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Just a constant for the System Configuration API functions.

21.4.216 LocalHostName as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: Gets the current local host name.

Example:

```
dim s as new SystemConfigurationMBS
msgbox s.LocalHostName
```

Notes: Returns the current local host name; "" if the name has not been set or if an error was encountered.

21.4.217 Location as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: Gets the current location identifier.

Example:

```
dim s as new SystemConfigurationMBS
msgbox s.Location
```

Notes: Returns a string representing the current location identifier; "" if no location identifier has been defined or if an error was encountered.

21.4.218 MachineName as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: The local machine name.

21.4.219 NetworkCheckReachabilityByAddress(ip as string, byref flags as Integer) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Determines if the given network address is reachable using the current network configuration.

Notes: address: The network address of the desired host.

flags: An integer that will be filled with a set of SCNetworkConnectionFlags detailing the reachability of the specified address.

Returns true if the network connection flags are valid; false if the status could not be determined.

(see the SCNetworkReachabilityMBS class for more details)

21.4.220 NetworkCheckReachabilityByName(nodename as string, byref flags as Integer) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Determines if the given network host/node name is reachable using the current network configuration.

Notes: nodename: The node name of the desired host.

flags: An integer that will be filled with a set of SCNetworkConnectionFlags detailing the reachability of the specified node name.

Returns true if the network connection flags are valid; false if the status could not be determined.

(see the SCNetworkReachabilityMBS class for more details)

21.4.221 NetworkInterfaceRefreshConfiguration(ifname as CFStringMBS) as boolean

Plugin Version: 4.2, Platform: macOS, Targets: All.

Function: Sends a notification to interested configuration agents to have them immediately retry their configuration over a particular network interface.

Notes: This API must be invoked by root (uid == 0).

ifName: The BSD name of the network interface e.g. NewCFStringMBS("en0").

Returns true if the notification was sent; false otherwise.

21.4.222 ShortUserName as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: The short user name.

21.4.223 UserName as string

Plugin Version: 7.8, Platform: macOS, Targets: All.

Function: The user name.

Notes: The function UserName returns a string based on the read UID (RUID, as returned by `getuid`) of the calling process. This can result in unexpected behavior (that is, Name returning different results than `ConsoleUser`) for processes that manipulate their UID.

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Chapter 23

The FAQ

23.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sure, here's a routine I use (which has an advantage over the previously-posted Date-based solution in that you don't have to rely on the creation of an object – all that happens is some division and string concatenation):

Example:

```
Function SecsToTimeString(timeInSecs as Integer, padHours as boolean, padMinutes as boolean) as string
// Given an amount time (in seconds), generates a string representing that amount
// of time. The padHours and padMinutes parameters determine whether to display
// hours and minutes if their values are zero.
```

```
// Examples:
// timeInSecs = 90, padHours = true; returns "00:01:30"
// timeInSecs = 1, padHours = false, padMinutes = true; returns "00:01"
// timeInSecs = 3601, padMinutes = false; returns "01:00:01"
```

```
dim hours, minutes, seconds as Integer
dim hoursString, minutesString as string
```

```
hours = timeInSecs / 3600
minutes = (timeInSecs mod 3600) / 60
seconds = timeInSecs mod 60
```

```
if hours = 0 then
if padHours then
hoursString = "00:"
else
hoursString = ""
end if
```

```

else
hoursString = Format(hours, "##\:")
end if
if minutes = 0 then
if hours <>0 or padMinutes then
minutesString = "00:"
else
minutesString = ""
end if
else
minutesString = Format(minutes, "00\:")
end if

return hoursString + minutesString + Format(seconds, "00")
End Function

```

Notes: (from the rb mailinglist)

23.0.2 Do you have plugins for Android?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Since there is no plugin SDK for Android, we have no way to make a plugin for Android.

Notes: We support macOS, Windows, Linux and iOS.

23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use functions from NSColor to get proper highlight color in RGB:

Example:

```

Function ProperHighlightColor(active as Boolean) As Color
#if TargetCocoa
Dim theColor As NSColorMBS
If active Then
theColor = NSColorMBS.alternateSelectedControlColor
Else
theColor = NSColorMBS.secondarySelectedControlColor
End If

```

```

Dim rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibrate-

```

```

dRGBColorSpace)
If rgbColor <>Nil Then
Dim red as Integer = rgbColor.redComponent * 255.0
Dim green as Integer = rgbColor.greenComponent * 255.0
Dim blue as Integer = rgbColor.blueComponent * 255.0
Return RGB(red, green, blue)
Else
Return HighlightColor
End If
#else
return HighlightColor
#endif
End Function

```

Notes: As you see we convert color to Calibrated RGB for best results.
See also:

- 23.0.4 How to catch delete key? 769
- 23.0.5 How to convert cmyk to rgb? 770
- 23.0.6 How to delete a folder? 771
- 23.0.7 How to detect if CPU is 64bit processor? 772
- 23.0.8 How to query variant type string for a variant? 773
- 23.0.9 How to refresh a htmlviewer on Windows? 774

23.0.4 How to catch delete key?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code in keydown event catches delete or backspace keys.

Example:

```

Function KeyDown(Key As String) As Boolean
if asc(key) = 8 or asc(key) = 127 then
MsgBox "Delete"
Return true
end if
End Function

```

See also:

- 23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 768

- 23.0.5 How to convert cmyk to rgb? 770
- 23.0.6 How to delete a folder? 771
- 23.0.7 How to detect if CPU is 64bit processor? 772
- 23.0.8 How to query variant type string for a variant? 773
- 23.0.9 How to refresh a htmlviewer on Windows? 774

23.0.5 How to convert cmyk to rgb?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

The following is the code to convert cmyk values to an RGB color datatype.

It's just a basic estimate of the color values. If you are looking for completely color accurate solution, this is not it. It should work for most people. :)

Example:

Function CMYKToRGB(c as Integer, m as Integer, y as Integer, k as Integer) As color

// converts c,m,y,k values (0-100) to color data type RGB

// place this in a method. Supply C,M,Y,K values-

// it returns color datatype

```
dim color_RGB as color
```

```
dim r, g, b as Integer
```

```
r=255-round(2.55*(c+k))
```

```
if r<0 then
```

```
r=0
```

```
end if
```

```
g=255-round(2.55*(m+k))
```

```
if g<0 then
```

```
g=0
```

```
end if
```

```
b=255-round(2.55*(y+k))
```

```
if b<0 then
```

```
b=0
```

```
end if
```

```
color_RGB=RGB(r,g,b)
```

```
return color_RGB
```

```
End Function
```

Notes:

(from the rb mailinglist)
See also:

- 23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 768
- 23.0.4 How to catch delete key? 769
- 23.0.6 How to delete a folder? 771
- 23.0.7 How to detect if CPU is 64bit processor? 772
- 23.0.8 How to query variant type string for a variant? 773
- 23.0.9 How to refresh a htmlviewer on Windows? 774

23.0.6 How to delete a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code that deletes a folder recursively.

Example:

```
Sub deletefolder(f as folderitem)
dim files(-1) as FolderItem

if f=nil then Return

// delete single file
if f.Directory=false then
f.Delete
Return
end if

// get a list of all items in that folder
dim i,c as Integer
c=F.Count
for i=1 to c
files.Append f.TrueItem(i)
next

// delete each item
for each fo as FolderItem in files
if fo=nil then
' ignore
elseif fo.Directory then
deletefolder fo
fo.delete
else ' file
```

```
fo.Delete
end if
next
```

```
f.Delete
End Sub
```

See also:

- 23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 768
- 23.0.4 How to catch delete key? 769
- 23.0.5 How to convert cmyk to rgb? 770
- 23.0.7 How to detect if CPU is 64bit processor? 772
- 23.0.8 How to query variant type string for a variant? 773
- 23.0.9 How to refresh a htmlviewer on Windows? 774

23.0.7 How to detect if CPU is 64bit processor?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Via CPUID you can ask CPU:

Example:

```
dim c as new CPUIDMBS

if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox "64-bit CPU"
else
MsgBox "32-bit CPU"
end if
```

Notes: Should work on all intel compatible CPUs.

See also:

- 23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 768
- 23.0.4 How to catch delete key? 769
- 23.0.5 How to convert cmyk to rgb? 770
- 23.0.6 How to delete a folder? 771
- 23.0.8 How to query variant type string for a variant? 773
- 23.0.9 How to refresh a htmlviewer on Windows? 774

23.0.8 How to query variant type string for a variant?

Plugin Version: 20.5, Platforms: macOS, Linux, Windows.

Answer: The following example function returns type string for variant.

Example:

```
Public Function VariantTypeString(v as Variant) as string
// Xojo's VarType doesn't know Unsigned integers
'Dim type As Integer = VarType(v)

// MBS VarType can detect unsigned integer
Dim type As Integer = GetVariantTypeMBS(v)

Dim IsArray As Boolean = BitwiseAnd(type, Variant.TypeArray) = Variant.TypeArray

// type without array
type = BitwiseAnd(type, Bitwise.OnesComplement(Variant.TypeArray))

// build a dictionary to map types on first call
Static TypeMap As Dictionary
If TypeMap = Nil Then
TypeMap = New Dictionary
TypeMap.Value(Variant.TypeBoolean) = "Boolean"
TypeMap.Value(Variant.TypeCFStringRef) = "CFStringRef"
TypeMap.Value(Variant.TypeColor) = "Color"
TypeMap.Value(Variant.TypeCString) = "CString"
TypeMap.Value(Variant.TypeCurrency) = "Currency"
TypeMap.Value(Variant.TypeDate) = "Date"
TypeMap.Value(Variant.TypeDateTime) = "DateTime"
TypeMap.Value(Variant.TypeDouble) = "Double"
TypeMap.Value(Variant.TypeInt32) = "Int32"
TypeMap.Value(Variant.TypeInt64) = "Int64"
TypeMap.Value(Variant.TypeInteger) = "Integer"
TypeMap.Value(Variant.TypeNil) = "Nil"
TypeMap.Value(Variant.TypeObject) = "Object"
TypeMap.Value(Variant.TypeOSType) = "OSType"
TypeMap.Value(Variant.TypePString) = "PString"
TypeMap.Value(Variant.TypePtr) = "Ptr"
TypeMap.Value(Variant.TypeSingle) = "Single"
TypeMap.Value(Variant.TypeString) = "String"
TypeMap.Value(Variant.TypeStructure) = "Structure"
TypeMap.Value(Variant.TypeText) = "Text"
TypeMap.Value(Variant.TypeWindowPtr) = "WindowPtr"
TypeMap.Value(Variant.TypeWString) = "WString"

// MBS extra types
TypeMap.Value(Variant.TypeInt32+100) = "UInt32"
TypeMap.Value(Variant.TypeInt64+100) = "UInt64"
```

End If

```
// lookup type

#if DebugBuild then
If Not TypeMap.HasKey(type) Then
Break // missing type
End If
#endif

If IsArray Then
Return "Array of " + TypeMap.Lookup(type,"?")
Else
Return TypeMap.Lookup(type,"?")
End If
End Function
```

See also:

- 23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 768
- 23.0.4 How to catch delete key? 769
- 23.0.5 How to convert cmyk to rgb? 770
- 23.0.6 How to delete a folder? 771
- 23.0.7 How to detect if CPU is 64bit processor? 772
- 23.0.9 How to refresh a htmlviewer on Windows? 774

23.0.9 How to refresh a htmlviewer on Windows?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can ask the browser to reload the website with this code line:

Example:

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:

- 23.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 768
- 23.0.4 How to catch delete key? 769
- 23.0.5 How to convert cmyk to rgb? 770

- 23.0.6 How to delete a folder? 771
- 23.0.7 How to detect if CPU is 64bit processor? 772
- 23.0.8 How to query variant type string for a variant? 773

23.0.10 Is there an example for vector graphics in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this example inside the paint event of a window:

Example:

```
dim v as Group2D
dim r as RectShape
dim s as StringShape
```

```
const pi=3.14
```

```
s=new StringShape
s.Text="Hello World!"
s.TextFont="Geneva"
s.TextSize=24
s.FillColor=rgb(0,0,255)
s.Italic=true
s.y=5
s.x=0
```

```
r=new RectShape
```

```
r.X=0
r.y=0
r.Height=100
r.Width=180
r.BorderColor=rgb(255,0,0)
r.FillColor=rgb(0,255,0)
r.BorderWidth=5
r.Border=50
```

```
v=new Group2d
v.Append r
v.Append s
v.Rotation=pi*-20.0/180.0
v.x=150
v.y=150
```

```
g.DrawObject v
```

23.0.11 Picture functions do not preserve resolution values?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the picture functions return pictures with no/default resolution values.

Example:

```
dim l as Picture = LogoMBS(500)
```

```
l.HorizontalResolution = 300
```

```
l.VerticalResolution = 300
```

```
dim r as Picture = l.Rotate90MBS
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

```
r.HorizontalResolution = l.HorizontalResolution
```

```
r.VerticalResolution = l.VerticalResolution
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

Notes: So please fix them yourself after calling a function.

Maybe in the future this changes, but currently you can't really set this easily from plugin code.

23.0.12 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Fill a memoryblock like this:

Example:

```
Dim MB As Memoryblock
```

```
MB = NewMemoryBlock(8)
```

```
MB.Short(0) = window1.Top
```

```
MB.Short(2) = window1.Left
```

```
MB.Short(4) = window1.Height+window1.Top // bottom
```

```
MB.Short(6) = window1.Width+window1.Left // right
```

23.0.13 API client not supported?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you get this exception message on `SQLConnectionMBS.Connect`, we may have a problem.

Notes: First case is that the given thing is not supported (e.g. MS SQL directly on Mac).

Second case is that the plugin compilation went wrong and the support for the database was not linked into the plugin. Like MySQL missing or MS SQL on Windows missing. In that case please contact us to fix the plugin.

23.0.14 Can I access Access Database with Java classes?

Plugin Version: all, Platform: Windows.

Answer: You can use `ucanaccess` to access databases created with Microsoft

Example:

```

dim options(-1) as string

// load all the jar files we have in a folder called java:

dim appFolder as FolderItem = GetFolderItem("")

Dim count as Integer = appFolder.Parent.Child("java").Count
dim libjs() as string
For i as Integer = 1 to count
Dim f As FolderItem = appFolder.Parent.Child("java").item(i)
If f <> Nil and f.Exists Then
libjs.append f.NativePath+";"
End If
Next

// now init virtual machine
dim library as string = Join(libjs, "")
dim vm as new JavaVMMBS(library)

if vm.Handle = 0 then
MsgBox "Failed to initialize virtual machine"
else
// now make a new database connection with ucanaccess
dim d as new JavaDatabaseMBS(vm,"net.ucanaccess.jdbc.UcanaccessDriver")
Dim DbFile as FolderItem = appFolder.Parent.Child("Database11.accdb")
dim j as JavaConnectionMBS = d.getConnection("jdbc:ucanaccess://" + DbFile.NativePath)

// select and show values
dim r as JavaResultSetMBS = j.MySelectSQL("Select * From test")
while r.NextRecord
MsgBox r.getString("FirstName") + " " + r.getString("LastName")
wend

end if

```

Exception e as JavaExceptionMBS
MsgBox e.message+" **errorcode:** "+str(e.ErrorNumber)

Notes: see website:
<http://ucanaccess.sourceforge.net/site.html>

23.0.15 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, we have a graphics class integration for DynaPDF.

Notes: Since MBS Plugin in version 19.2, we can integrate reports with Xojo.

23.0.16 Can I use AppleScripts in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Example:

```
dim a as new AppleScriptMBS

// query my application name
a.Compile "tell application ""System Events"" to return name of current application"

// run
a.Execute

// show result
label1.text = a.Result

// shows something like "My Application.fcgi.debug"
```

Notes: This can be useful to control the server from remote, if and only if the your sever is running Mac OS X.

23.0.17 Can I use graphics class with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sorry, no. We can't provide a graphics subclass from plugin.

Notes: This is a feature request to allow graphics subclasses:
Feedback case 11391: [feedback://showreport?report_id=11391](https://feedback.apple.com/feedback/showreport?report_id=11391)

23.0.18 Can I use sockets on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Notes: You can use `HTTPSocket`, `SMTPSocket`, `POP3Socket`, `SMTPSecureSocket`, `SecurePOP3Socket`, `EasyTCPSocket`, `EasyUDPSocket`, `AutoDiscovery`, our Bonjour classes or our `CURL*` classes. But all of them work on the server, not on the client.

This means if you search for a printer with Bonjour, you can find the printers in the local network on your server hosting site. Using `SMTPSocket` may be a good idea for sending emails from the server like notifications.

23.0.19 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.

Example:

```
// The data for the pie chart
dim data(-1) as Double=array(55.0, 18.0, 25.0, 22.0, 18.0, 30.0, 35.0)

// The labels for the pie chart, Words are chosen random to check font!
dim labels(-1) as string=array("Germany", "Italy", "France", "Spain", "UK", "Poland", "Russia")

// The colors to use for the sectors
dim colors(-1) as Integer

colors.Append &h66aaee
colors.Append &heebb22
colors.Append &hbbsbbb
colors.Append &h8844ff

if TargetLinux then
  CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype/msttcorefonts"
end if

// Create a PieChart object of size 360 x 300 pixels
dim c as new CDPieChartMBS(700, 600)
```

```

c.setBackground(c.linearGradientColor(0, 0, 0, c.getHeight(), &h0000cc, &h000044))
c.setRoundedFrame(&hffffff, 16)
dim tt as CDTextBoxMBS = c.addTitle("ChartDirector Demonstration", "timesbi.ttf", 18)
tt.setMargin(0, 0, 16, 0)
tt.setFontColor(&hFFFFFF)

// Set the center of the pie at (180, 140) and the radius to 100 pixels
c.setPieSize 350,300,150
// Set the sector colors
c.setColors(c.kDataColor, colors)

// Draw the pie in 3D with a pie thickness of 20 pixels
c.set3D(20)

dim t as CDTextBoxMBS = c.setLabelStyle("arialbd.ttf", 10, &h000000)
t.setBackground(CDPieChartMBS.kSameAsMainColor, CDPieChartMBS.kTransparent, CDPieChartMBS.soft-
Lighting(CDPieChartMBS.kRight, 0))
t.setRoundedCorners(8)

// Use local gradient shading for the sectors, with 5 pixels wide
// semi-transparent white (bbffffff) borders
c.setSectorStyle(CDPieChartMBS.kLocalGradientShading, &hbbffffff, 0)

// Set the pie data and the pie labels
c.setData data,labels
call c.setLabelStyle "arialbd.ttf",18

dim pic as picture = c.makeChartPicture
dim wp as new WebPicture(pic, Picture.FormatJPEG) // JPEG makes it smaller and faster

ImageView1.Picture=wp

```

Notes: Be aware that our plugin produces pictures for you, which you assign to ImageViews. Transferring those pictures takes time, so you can optimize that with using WebPicture class. There you can decide between different compressions to improve speed (use JPEG instead of PNG).

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

23.0.20 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our DynaPDF plugin works just fine on the Xojo Web Edition.

Notes: PDF files are created on the server. You may want to offer a preview to the user which uses reduced resolution images to reduce the time to download the PDF.

See our Create PDF example for the Xojo Web Edition.

23.0.21 Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: No.

23.0.22 Can you get an unique machine ID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There is nothing like an unique machine ID.

Notes: 1:

You can use the MAC IDs of the network interfaces.

This can be changed by the user with software tools.

And the list of network interfaces changes if user reorder the interfaces.

2:

You can use the system folder creation date/time.

This may stay equal after cloning machines or after migration to new PC.

3:

You can use the Mac Serialnumber.

Mac only and it can happen that a Mac does not have a serial number.

4:

You can use the x86 CPU ID.

This is x86 CPU only and does not avoid running on the same CPU in different PCs.

23.0.23 ChartDirector: Alignment Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Alignment Specification

Notes: In many ChartDirector objects, you may specify the alignment of the object's content relative to its boundary. For example, for a TextBox object, you may specify the text's alignment relative to the box boundary by using TextBox.setAlignment.

The ChartDirector API defines several constants for the alignment options.

ConstantValueDescription

BottomLeft	1	The leftmost point on the bottom line.
BottomCenter	2	The center point on the bottom line.
BottomRight	3	The rightmost point on the bottom line.
Left	4	The leftmost point on the middle horizontal line.
Center	5	The center point on the middle horizontal line.
Right	6	The rightmost point on the middle horizontal line.
TopLeft	7	The leftmost point on the top line.
TopCenter	8	The center point on the top line.
TopRight	9	The rightmost point on the top line.
Bottom	2	The center point on the bottom line. Same as BottomCenter.
Top	8	The center point on the top line. Same as TopCenter.
TopLeft2	10	An alternative top-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopLeft2 refers to refers to the left of the top side, while TopLeft refers to the top of the left side. The reverse applies for a horizontal axis.
TopRight2	11	An alternative top-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopRight2 refers to refers to the right of the top side, while TopRight refers to the top of the right side. The reverse applies for a horizontal axis.
BottomLeft2	12	An alternative bottom-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomLeft2 refers to refers to the left of the bottom side, while BottomLeft refers to the bottom of the left side. The reverse applies for a horizontal axis.
BottomRight2	13	An alternative bottom-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomRight2 refers to refers to the right of the bottom side, while BottomRight refers to the bottom of the right side. The reverse applies for a horizontal axis.

23.0.24 ChartDirector: Color Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Color Specification

Notes: Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports col-

ors specified in web and HTML compatible ARGB format, in which ARGB refers to the Alpha transparency, Red, Green and Blue components of the color.

In addition to ARGB colors, ChartDirector supports "dynamic" colors. A dynamic color is a color that changes depending on the position of the pixels. The "dynamic" colors that ChartDirector supports include "pattern colors", "metal colors", "gradient colors", "zone colors" and "dash line colors".

ChartDirector supports specifying colors indirectly using "palette colors". When a "palette color" is used, the color is specified as an index to a palette. The actual color is looked up from the palette. ARGB Color ARGB color consists of 4 components - alpha transparency, red, green and blue. The four components are encoded as a 32-bit number, with each component occupying 8 bits. In hexadecimal notation, it is AAR-RGGBB, where AA, RR, GG and BB are the alpha transparency, red, green and blue components.

Each component ranges from 00 - FF (0 - 255), representing its intensity. For example, pure red color is 00FF0000, pure green color is 0000FF00, and pure blue color is 000000FF. White color is 00FFFFFF, and black color is 00000000.

Most programming language requires you to put special prefix in front of hexadecimal characters. For C++, the prefix is "0x". For example, the syntax for the hexadecimal number 00FFFFFF is 0x00FFFFFF, or simply 0xFFFFFF.

For the alpha transparency component, a zero value means the color is not transparent at all. This is equivalent to traditional RGB colors. A non-zero alpha transparency means the color is partially transparent. The larger the alpha transparency, the more transparent the color will be. If a partially transparent color is used to draw something, the underlying background can still be seen.

For example, 80FF0000 is a partially transparent red color, while 00FF0000 is a non-transparent red color.

Note that ChartDirector's ARGB color is web and HTML compatible. For example, red is FF0000, the same as in HTML. There are many resources on the web that provide tables in which you can click a color and it will show its HTML color code. These color codes can be used in ChartDirector.

If alpha transparency is FF (255), the color is totally transparent. That means the color is invisible. It does not matter what the RGB components are. So in ChartDirector, only one totally transparent color is used - FF000000. All other colors of the form FFnnnnnn are reserved to represent palette colors and dynamic colors, and should not be interpreted as the normal ARGB colors.

The totally transparent color FF000000 is often used in ChartDirector to disable drawing something. For example, if you want to disable drawing the border of a rectangle, you can set the border color to totally transparent.

For convenience, ChartDirector defines a constant called Transparent, which is equivalent to FF000000. Pattern Color

A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

Pattern colors are created using `BaseChart.patternColor`, `BaseChart.patternColor2`, `DrawArea.patternColor` and `DrawArea.patternColor2`. The `patternColor` method creates pattern colors using an array of colors as a bitmap. The `patternColor2` method creates pattern colors by loading the patterns from image files.

These methods return a 32-bit integer acting as a handle to the pattern color. The handle can be used in any `ChartDirector` API that expects a color as its input.

Metal Color
A metal color is a color of which the brightness varies smoothly across the chart surface as to make the surface look shiny and metallic. `ChartDirector` supports using any color as the base color of the metal color. In particular, using yellow and grey as the base colors will result in metal colors that look gold and silver.

Metal colors are most often used as background colors of charts. They are created using `CDBaseChartMBS.metalColor`, `CDBaseChartMBS.goldColor` and `CDBaseChartMBS.silverColor`. The first method allows you to specify an arbitrary base color. The second and third methods use yellow and grey as the base colors, resulting in gold and silver metal colors.

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any `ChartDirector` API that expects a color as its input.

Gradient Color
A gradient color is a color that changes progressively across a direction.

Gradient colors are created using `BaseChart.gradientColor`, `BaseChart.gradientColor2`, `DrawArea.gradientColor` and `DrawArea.gradientColor2`. The `gradientColor` method creates a 2-point gradient color that changes from color A to color B. The `gradientColor2` method creates a multi-point gradient colors that changes from color A to B to C

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any `ChartDirector` API that expects a color as its input.

One common use of multi-point gradient colors is to define colors that have metallic look and feel. Please refer to `DrawArea.gradientColor2` for details.

Dash Line Colors
A dash line color is a color that switches on and off periodically. When used to draw a line, the line will appear as a dash line.

Dash line colors are created using `BaseChart.dashLineColor` and `DrawArea.dashLineColor`. They accept a line color and a dash pattern code as arguments, and return a 32-bit integer acting as a handle to the dash line color. The handle can be used in any `ChartDirector` API that expects a color as its input.

Zone Colors
A zone color is for XY charts only. It is a color that automatically changes upon reaching a data threshold value along the x-axis or y-axis. Zone colors are created using `Layer.xZoneColor`, `Layer.yZoneColor`, `XYChart.xZoneColor` or `XYChart.yZoneColor`.

Palette Colors
Palette colors are colors of the format `FFFFnnnn`, where the least significant 16 bits (`nnnn`) are the index to the palette. A palette is simply an array of colors. For a palette color, the actual color is obtained by

looking up the palette using the index. For example, the color FFFF0001 is the second color in the palette (first color is index 0).

The colors in the palette can be ARGB colors or "dynamic" colors (pattern, gradient and dash line colors).

The first eight palette colors have special significance. The first three palette colors are the background color, default line color, and default text color of the chart. The 4th to 7th palette colors are reserved for future use. The 8th color is a special dynamic color that is equal to the data color of the "current data set".

The 9th color (index = 8) onwards are used for automatic data colors. For example, in a pie chart, if the sector colors are not specified, ChartDirector will automatically use the 9th color for the first sector, the 10th color for the second sector, and so on. Similarly, for a multi-line chart, if the line colors are not specified, ChartDirector will use the 9th color for the first line, the 10th color for the second line, and so on.

The ChartDirector API defines several constants to facilitate using palette colors.

ConstantValueDescription

Palette	FFFF0000	The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1).
BackgroundColor	FFFF0000	The background color.
LineColor	FFFF0001	The default line color.
TextColor	FFFF0002	The default text color.
[Reserved]	FFFF0003 - FFFF0006	These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance.
SameAsMainColor	FFFF0007	A dynamic color that is equal to the data color of the current data set. This color is useful for objects that are associated with data sets. For example, in a pie chart, if the sector label background color is SameAsMainColor, its color will be the same as the corresponding sector color.
DataColor	FFFF0008	The starting point for the automatic data color allocation.

When a chart is created, it has a default palette. You may modify the palette using BaseChart.setColor, BaseChart.setColors, or BaseChart.setColors2.

The advantages of using palette colors are that you can change the color schemes of the chart in one place. ChartDirector comes with several built-in palettes represented by the following predefined constants.

ConstantDescription

23.0.25 ChartDirector: Font Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

defaultPalette	An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds).
whiteOnBlackPalette	An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds).
transparentPalette	An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent.

Answer: ChartDirector: Font Specification

Notes: Font Name

In ChartDirector, the font name is simply the file name that contains the font. For example, under the Windows platform, the "Arial" font is "arial.ttf", while the "Arial Bold" font is "arialbd.ttf".

NOTE: Mac OS X Specific Information

In Mac OS X, in addition to ".ttf", ChartDirector also supports Mac OS X font file formats, such as Font Suitcase files and Datafork files (.dfont). These files often contain multiple fonts. For example, the "GillSans.dfont" file contains 6 fonts.

So in addition to the file name, an index is needed to determine the font. The index is specified by appending a " | " character to the font name, followed by the index number. For example, the third font in "GillSans.dfont" is denoted as "GillSans.dfont | 2". (Note: The first font starts at 0.) If no index number is provided, the first font is assumed.

ChartDirector also supports using Mac OS X Font Manager names. For example, one may use "Gill Sans Light Italic" instead of using "GillSans.dfont | 1" as the font name. However, the Mac OS X Font Manager is active only if someone has logged into the Mac GUI console, so this method is only recommended for developing applications that run on the GUI console.

The sample programs that come with ChartDirector are designed to run on all operating systems, so they use generic font file names (eg. "arial.ttf") instead of Mac OS X specific names. To allow them to run on Mac OS X, ChartDirector on Mac OS X has a built-in table to map common font file names to Mac OS X font names:

"arial.ttf", "arialbd.ttf", "ariali.ttf" and "arialbi.ttf" are mapped to "Arial | 0" (Arial), "Arial | 1" (Arial Bold), "Arial | 2" (Arial Italic) and "Arial | 3" (Arial Bold Italic)

"times.ttf", "timesbd.ttf", "timesi.ttf" and "timesbi.ttf" are mapped to "Times New Roman | 0" (Times New Roman), "Times New Roman | 1" (Times New Roman Bold), "Times New Roman | 2" (Times New Roman Italic) and "Times New Roman | 3" (Times New Roman Bold Italic)

"cour.ttf", "courbd.ttf", "couri.ttf" and "courbi.ttf" are mapped to "Courier New | 0" (Courier New), "Courier New | 1" (Courier New Bold), "Courier New | 2" (Courier New Italic) and "Courier New | 3" (Courier New Bold Italic)

Font Location

ChartDirector on Windows does not come with any font files. It relies on the operating system's font files in the " [windows] \Fonts" directory. To see what fonts are installed in your operating system and their file names, use the File Explorer to view that directory.

ChartDirector on Windows will also search for the font files in the "fonts" subdirectory (if it exists) under the directory where the ChartDirector DLL "chartdir.dll" is installed. This is useful for private fonts. Also, for some especially secure web servers, the web anonymous user may not have access to the " [windows] \Fonts" directory. In this case, you may copy the font files to the above subdirectory.

ChartDirector on Mac OS X relies on operating system font files in "/Library/Fonts" and "/System/Library/Fonts".

ChartDirector on Linux, FreeBSD and Solaris assume the fonts files are in the "fonts" subdirectory under the directory where the ChartDirector shared object "libchartdir.so" is installed. ChartDirector on Linux, FreeBSD and Solaris come with a number of font files in the "fonts" subdirectory.

To keep the download size small, ChartDirector on Linux, FreeBSD and Solaris only come with some commonly used fonts. You may download additional fonts from the Internet. In particular, the Microsoft fonts at

http://sourceforge.net/project/showfiles.php?group_id=34153&release_id=105355

is highly recommended. Please refer to

<http://www.microsoft.com/typography/faq/faq8.htm>

on how you could use the fonts legally in your system.

ChartDirector supports True Type fonts (.ttf), Type 1 fonts (.pfa and .pfb) and Windows bitmap fonts (.fon). On Mac OS X, ChartDirector also supports Font Suitcase and Datafork (.dfont) files. On Linux, FreeBSD and Solaris, ChartDirector also supports Portable Compiled Fonts (.pcf fonts).

If you want ChartDirector to search other directories for the font files, you may list the directories in an environment variable called "FONTSPATH".

If you specify an absolute path name for the font file, ChartDirector will use the absolute path name and will not search other directories.

Artificial Boldening and Italicizing

Whereas most popular font comes with different styles for "normal", "bold", "italic" and "bold italic", some fonts only come with one style (the normal style). For example, the Monotype Corsiva font that comes with MS Office only has the normal style (mtcorsva.ttf). For these cases, you may append the "Bold" and/or "Italic" words after the font file name (separated with a space) to ask ChartDirector to artificially bolden and/or italicize the font. For example, you may specify the font name as "mtcorsva.ttf Bold".

Font List

Instead of specifying a single font file as the font name, you may specify a list of font files as the font name, separated by semi-colons. This is useful when using international characters that are only available in some fonts.

For example, if you would like to use the Arial font ("arial.ttf") for western characters, and the MingLiu font "mingliu.ttc" for Chinese characters (since the Arial font does not have Chinese characters), you may specify the font name as "arial.ttf;mingliu.ttc". In this case, ChartDirector will try the Arial font first. If it cannot find a certain character there, it will try the MingLiu font.

ChartDirector supports several special keywords for specifying the font name indirectly. When these keywords are used as font names, ChartDirector will look up the actual font names from a font table. The keywords are as follows:

KeywordsDescription

"normal"	This default normal font, which is the first font in the font table. This is initially mapped to "arial.ttf" (Arial).
"bold"	The default bold font, which is the second font in the font table. This is initially mapped to "arialbd.ttf" (Arial Bold).
"italic"	The default italic font, which is the third font in the font table. This is initially mapped to "ariali.ttf" (Arial Italic).
"boldItalic"	The default bold-italic font, which is the fourth font in the font table. This is initially mapped to "arialbi.ttf" (Arial Bold Italic).
"fontN"	The (N + 1)th font in the font table (the first font is "font0").

The font table can be modified using `BaseChart.setFontTable` or `DrawArea.setFontTable`.

The advantage of using indirect font names is that you can change the fonts in your charts in one place.

Most font files contain one font. However, it is possible a font file contains multiple fonts (that is, a font collection). For example, in True Type fonts, font files with extension ".ttc" may represent a font collection.

If a font file contains multiple font, the font index can be used to specify which font to use. By default, the font index is 0, which means the first font in the font file will be used.

The font size decides how big a font will appear in the image. The font size is expressed in a font unit called points. This is the same unit used in common word processors.

Instead of specifying font size, some ChartDirector API (eg. `TextBox.setFontSize`) allow you to specify font height and font width separately. You may use different point sizes for font height and font width to create special effects.

This is the color to draw the font. (See Color Specification on how colors are represented in ChartDirector.)

This is the angle in degrees by which the font should be rotated anti-clockwise.

By default, text are laid out horizontally, with characters being drawn from left to right.

ChartDirector also supports vertical layout, with characters being drawn from top to bottom. For example, you may use `BaseChart.addText` to add text that are laid out vertically. Vertical layout is common for

oriental languages such as Chinese, Japanese and Korean.

23.0.26 ChartDirector: Mark Up Language

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Mark Up Language

Notes: ChartDirector Mark Up Language (CDML) is a language for including formatting information in text strings by marking up the text with tags.

CDML allows a single text string to be rendered using multiple fonts, with different colors, and even embed images in the text. **Font Styles**

You can change the style of the text by using CDML tags. For example, the line:

```
<*font=timesi.ttf,size=16,color=FF0000>Hello <*font=arial.ttf,size=12,color=8000*>world!
```

will result in the following text rendered:

In general, all tags in CDML are enclosed by <*> and *>. Attributes within the tags determine the styles of the text following the tags within the same block.

If you want to include <*> in text without being interpreted as CDML tags, use «* as the escape sequence.

The following table describes the supported font style attributes in CDML. See [Font Specification](#) for details on various font attributes.

AttributeDescription

Set the following text to be in superscript style. This attribute does not need to have a value. (You may use "super" as the attribute instead of "super=1".)

Note that unlike HTML tags, no double or single quotes are used in the tags. It is because CDML tags are often embedded as string literals in source code. The double or single quotes, if used, will conflict with the string literal quotes in the source code. Therefore in CDML, no quotes are necessary and they must not be used.

Also, unlike HTML tags, CDML uses the comma character as the delimiter between attributes. It is because certain attributes may contain embed spaces (such as the font file name). So space is not used as the delimiter and the comma character is used instead.

Note the font attribute above starts a new style section, while other attributes just modify the current style

font	Starts a new style section, and sets the font name. You may use this attribute without a value (that is, use "font" instead of "font=arial.ttf") to create a new style section without modifying the font name.
size	The font size.
width	The font width. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
height	The font height. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
color	The text color in hex format.
bgColor	The background color of the text in hex format.
underline	The line width of the line used to underline the following characters. Set to 0 to disable underline.
sub	Set the following text to be in subscript style. This attribute does not need to have a value. (You may use "sub" as the attribute instead of "sub=1".)
super	Set the following text to be in superscript style.
xoffset	Draw the following the text by shifting the text horizontally from the original position by the specified offset in pixels.
yoffset	Draw the following the text by shifting the text vertically from the original position by the specified offset in pixels.
advance	Move the cursor forward (to the right) by the number of pixels as specified by the value this attribute.
advanceTo	Move the cursor forward (to the right) to the position as specified by the value this attribute. The position is specified as the number of pixels to the right of the left border of the block. If the cursor has already passed through the specified position, the cursor is not moved.

section. You may use `</font*>` to terminate a style section, which will restore the font styles to the state before the style section.

Blocks and Lines

In CDML, a text string may contain multiple blocks. A block may contain multiple lines of text by separating them with new line characters ("`\n`") or with `<br*>`. The latter is useful for programming languages that cannot represent new line characters easily.

For example, the line:

```
<*size=15*><*block*><*color=FF*>BLOCK<*br*>ONE<*/*>and <*block*><*color=FF00*>BLOCK<*br*>TWO
```

will result in the following text rendered:

The above example contains a line of text. The line contains two blocks with the characters " and " in between. Each block in turn contains two lines. The blocks are defined using `<*block*>` as the start tag and

`<*/*>` as the end tag.

When a block ends, font styles will be restored to the state before entering the block. Embedding Images
CDML supports embedding images in text using the following syntax:

```
<*img=my_image_file.png*>
where my_image_file.png is the path name of the image file.
```

For example, the line:

```
<*size=20*>A <*img=sun.png*>day
will result in the following text rendered:
```

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to `BaseChart.setSearchPath` or `DrawArea.setSearchPath` on the directory that ChartDirector will search for the file.

The `<*img*>` tag may optionally contain width and height attributes to specify its pixel width and height. In this case, ChartDirector will stretch or compress the image if necessary to the required width and height. Blocks Attributes

CDML supports nesting blocks, that is, a block can contain other sub-blocks. Attributes are supported in the `<*block*>` tag to control the alignment and orientation of the sub-blocks. The `<*img=my_image_file.png*>` is treated as a block for layout purposes.

For example, the line:

```
<*block,valign=absmiddle*><*img=molecule.png*><*block*>Hydrazino\nMolecule<*/*><*/*>
will result in the following text rendered:
```

The the above starts `<*block,valign=absmiddle*>` which specifies its content should align with each others in the vertical direction using the absolute middle alignment. The block contains an image, followed by a space characters, and then another block which has two lines of text.

The following table describes the supported attributes inside `<*block*>` tag:

Attribute	Description
-----------	-------------

The value `baseline` means the baseline of sub-blocks should align with the baseline of the block. The `baseline`

width	The width of the block in pixels. By default, the width is automatically determined to be the width necessary for the contents of the block. If the width attribute is specified, it will be used as the width of the block. If the width is insufficient for the contents, the contents will be wrapped into multiple lines.
height	The height of the block in pixels. By default, the height is automatically determined to be the height necessary for the contents of the block. If the height attribute is specified, it will be used as the height of the block.
maxwidth	The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines.
truncate	The maximum number of lines of the block. If the content requires more than the maximum number of lines, it will be truncated. In particular, if truncate is 1, the content will be truncated if it exceeds the maximum width (as specified by maxwidth or width) without wrapping. The last few characters at the truncation point will be replaced with "...".
linespacing	The spacing between lines as a ratio to the default line spacing. For example, a line spacing of 2 means the line spacing is two times the default line spacing. The default line spacing is the line spacing as specified in the font used.
bgColor	The background color of the block in hex format.
valign	The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle.

is the underline position of text. This is normal method of aligning text, and is the default in CDML. For images or blocks that are rotated, the baseline is the same as the bottom.

The value top means the top line of sub-blocks should align with the top line of the block.

The value bottom means the bottom line of sub-blocks should align with the bottom line of the block.

The value middle means the middle line of sub-blocks should align with the the middle line of the block. The middle line is the middle position between the top line and the baseline.

The value absmiddle means the absolute middle line of sub-blocks should align with the absolute middle line of the block. The absolute middle line is the middle position between the top line and the bottom line.

halign The horizontal alignment of lines. This is for blocks that contain multiple lines. Supported values are left, center and right.

The value left means the left border of each line should align with the left border of the block. This is the default.

The value center means the horizontal center of each line should align with the horizontal center of the block.

The value right means the right border of each line should align with the right border of the block.

angle Rotate the content of the block by an angle. The angle is specified in degrees in counter-clockwise direction.

23.0.27 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Parameter Substitution and Formatting

Notes: ChartDirector charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, HTML image maps, etc, are all text strings.

ChartDirector uses parameter substitution to allow you to configure precisely the information contained in the text and their format.

Format Strings

In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

```
" { label } ( { percent } %)"
```

When the sector label is actually drawn, ChartDirector will replace " { label } " with the sector name, and " { percent } " with the sector percentage. So the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

```
" { label } : US$ { value | 2 } K ( { percent } %)"
```

The sector label will then become something like "ABC: US\$ 123.00 (34.56%)".

In general, in ChartDirector parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, ChartDirector supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the Number Formatting and Date/Time Formatting sections below for details.

Parameter Expressions

ChartDirector supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

```
"USD { value } (Euro { = { value } *0.9 } )"
```

In the above, "{ value }" will be substituted with the actual value of the sector. The expression "{ = { value } *0.9 }" will be substituted with the actual value of the sector multiplied by 0.9.

ChartDirector parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

Parameter	Description
sector	The sector number. The first sector is 0, while the nth sector is (n-1).
dataSet	Same as { sector } . See above.
label	The text label of the sector.
dataSetName	Same as { label } . See above.
value	The data value of the sector.
percent	The percentage value of the sector.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using BaseChart.addExtraField or BaseChart.addExtraField2.

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the { dataSetName } parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for Line Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Trend Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Box-Whisker Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for HLOC and CandleStick Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Vector Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameters for All Polar Layers

The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for PolarVector Layers

The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameters for Axis

The following table describes the parameters available for pie charts.

Number Formatting

For parameters that are numbers, ChartDirector supports a number of formatting options in parameter substitution.

For example, if you want a numeric field { value } to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use { value | 2, . } . The number 123456.789 will then be displayed as 123,456.79.

For numbers, the formatting options are specified using the following syntax:

```
{ [ param ] | [ a ] [ b ] [ c ] [ d ] }
```

where:

If this field starts with "E" or "e", followed by a number, it means formatting the value using scientific notation with the specified number of decimal places. If the "E" or "e" is not followed by a number, 3 is assumed.

For example, { value | E4 } will format the value 10.3 to 1.0300E+1, and { value | e4 } will format the same value to 1.0300e+1.

If this field starts with "G" or "g", followed by a number, it means formatting the value using the scientific notation only if the value is large and requires more than the specified number of digits, or the value is less than 0.001. If scientific notation is used, the number following "G" or "g" also specifies the number of significant digits to use. If the "G" or "g" is not followed by a number, 4 is assumed.

For example, consider the format string { value | G4 } . The value 10 will be formatted to 10. The value 100000 will be formatted to 1.000E+5. Similarly, for { value | g4 } , the value 10 will be formatted to 10, while the value 100000 will be formatted to 1.000e+5.

If you skip this argument, ChartDirector will display the exact value using at most 6 decimal places.

You may skip [b] [c] [d] . In this case, the default will be used.

Date/Time Formatting

For parameters that are dates/times, the formatting options can be specified using the following syntax:

```
{ [ param ] | [ datetime_format_string ] }
```

where [datetime_format_string] must start with an english character (A-Z or a-z) that is not "G", "g", "E" or "e", and may contain any characters except ' ' . (If it starts with "G", "g", "E" or "e", it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

For example, a parameter substitution format of { value | mm-dd-yyyy } will display a date as something similar to 09-15-2002. A format of { value | dd/mm/yy hh:nn:ss a } will display a date as something similar to 15/09/02 03:04:05 pm.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format { value | mmm '<*color=dd0000*>'yyyy } will display a date as something like Jan <*color=dd0000*>2005 (the <*color=dd0000*> is a CDML tag to specify red text color). Note that the <*color=dd0000*> tag is copied directly without substitution, even it contains "dd" which normally will be substituted with the day of month.

Escaping URL/HTML/CDML characters

Parameter substitution is often used to create HTML image maps. In HTML, some characters has special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, ChartDirector will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&#nn;" (eg. ">" will become ">"). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - " { escape_url } ", " { noescape_url } ", " { escape_html } ", " { noescape_html } ", " { escape_cdml } " and " { noescape_cdml } ". These fields enable/disable the escape methods used in the template fields that follow them.

23.0.28 ChartDirector: Shape Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Shape Specification

Notes: Several ChartDirector API accept shape specification as arguments. For example, BarLayer.setBarShape and BarLayer.setBarShape2 can be used to specify shapes of bars in bar charts, while DataSet.setDataSymbol, DataSet.setDataSymbol4, PolarLayer.setDataSymbol and PolarLayer.setDataSymbol4 can be used to specify shapes for data symbols.

Note that in addition to shapes, in many cases ChartDirector also accepts images or custom draw objects for data representation. For example, see DataSet.setDataSymbol2, DataSet.setDataSymbol3, PolarLayer.setDataSymbol2 and PolarLayer.setDataSymbol3.

Built-In Shapes

Built-in shapes are specified as integers. The integers can be explicit constants, or can be generated by a `ChartDirector` method for parameterized shapes. For example, a circle is represented by an explicit constant `CircleShape (=7)`. On the other hand, the number representing a polygon depends on the number of sides the polygon has, so it is generated by using the `PolygonShape` method, passing in the number of sides as argument.

The following table illustrates the various `ChartDirector` shapes:

Custom Shapes

In `ChartDirector`, custom shapes are specified as an array of integers `x0, y0, x1, y1, x2, y2 ...` representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 1000 x 1000 units, in which the x-axis is from -500 to 500 going from left to right, and the y-axis is from 0 to 1000 going from bottom to top.

`ChartDirector` will automatically scale the polygon so that 1000 units will become to the pixel size as requested by the various `ChartDirector` API.

As an example, the shape of the standard diamond shape in `ChartDirector` is represented as an array with 8 numbers:

```
0, 0, 500, 500, 0, 1000, -500, 500
```

23.0.29 Copy styled text?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to quickly copy styled text from one textarea to another?

Example:

```
#if TargetWin32 then
TextArea1.WinRTFDataMBS = TextArea2.WinRTFDataMBS
#elseif TargetMacOS then
TextArea1.NSTextViewMBS.textStorage.setAttributedString TextArea2.NSTextViewMBS.textStorage
#else
TextArea1.StyledText = TextArea2.StyledText
#endif
```

Notes: The code above uses special plugin functions on Mac and Windows and falls back to framework for Linux.

23.0.30 Do you have code to validate a credit card number?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can check the checksum to tell if a credit card number is not valid.

Example:

```

Dim strNumber As String
Dim nLength as Integer
Dim nValue as Integer
Dim nChecksum as Integer
Dim nIndex as Integer

strNumber = EditField1.Text
nLength = Len(strNumber)
nChecksum = 0

For nIndex = 0 To nLength - 2
nValue = Val(Mid(strNumber, nLength - (nIndex + 1), 1)) * (2 - (nIndex Mod 2))
If nValue <10 Then
nChecksum = nChecksum + nValue
Else
nChecksum = nChecksum + (nValue - 9)
End If
Next

If Val(Mid(strNumber, Len(strNumber), 1)) = (10 - (nChecksum Mod 10)) Mod 10 Then
MsgBox("The credit card number looks valid")
Else
MsgBox("The credit card number is invalid")
End IF

```

Notes: Here's some code that will validate the checksum for a credit card. It works for Visa, MasterCard, American Express and Discover. Not sure about others, but I imagine they use the same basic algorithm. Of course, this doesn't actually mean that the credit card is valid, it's only useful for helping the user catch typos.

The above code doesn't have any error checking and it expects that the credit card number will be entered without spaces, dashes or any other non-numeric characters. Addressing those issues will be an exercise left to the reader. :)

(From Mike Stefanik)

23.0.31 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all.

Answer: Our EyeOne plugin is available on request for licensees of the X-Rite SDKs.

Notes: Please first go to X-Rite and get a SDK license.

Then we can talk about the plugin.

23.0.32 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the plugin can work with multiple recordsets.

Notes: You need to use SQLCommandMBS class. When you get back results, you use FetchNext to walk over all records in the first result set. Then you simply start again with FetchNext to get the second record set.

Even the RecordSet functions should work, just use them twice to get all records from both record sets.

23.0.33 Does the plugin home home?

Plugin Version: all, Platform: macOS.

Answer: Yes, we like to know who is using the plugin, so the plugin may contact our server.

Example:

none.

Notes: Please note that this does not affect your users as the plugin will only do this in the IDE and the relevant plugin part is never included in your applications.

The plugin if used for some hours, does contact our server to provide statistical data about Xojo version and OS versions. This way we know what versions are used. We can return the version number of the current plugin which may be visible in future versions somehow. And we transmit partial licenses data so we can track use of illegal license keys.

If you do not like to have this, you can block Xojo IDE from contacting our website via your Firewall.

Blocking the transfer will not disable the plugin or change the features.

Or contact us for a plugin version which explicitly does not contain this feature.

23.0.34 folderitem.absolutePath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Paths on a Mac are not unique, so use them only to display them to the user.

Example:

```
Function AbsolutePath(f as FolderItem) As String
Dim s as string
Dim nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + "." + s
nf = nf.parent
wend
Return s
End Function
```

23.0.35 Has anyone played round with using CoreImage to do things like add dissolve transitions say when changing from one tab to another within a window?

Platform: macOS.

Answer: This code implements animations for a tabpanel change:

Example:

// in a tabpanel.change event:

```
dim r as CGSTransitionRequestMBS
dim co as new CGSConnectionMBS
dim cw as CGSWindowMBS
dim ct as CGSTransitionMBS
static OldTab as Integer

cw=co.CGSWindow(window1)
If cw = Nil Then
return // 10.3...
End If
r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
```

```

// watch the value of the clicked tab versus the last tab
if tabpanel1.Value=0 or tabpanel1.Value <OldTab then
r.TransitionOption=r.CGSLeft
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
else
r.TransitionOption=r.CGSRight
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
end if
// Keep track of the last tab clicked
OldTab = tabpanel1.Value

```

Notes: See CGS* classes for more details.

23.0.36 How about Plugin support for older OS X?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We support in general Mac OS X 10.5 and newer.

Notes: All the 64-bit plugins on Mac require OS X 10.7.

Intel 32-bit plugins on Mac require OS X 10.5 or newer.

Currently the ChartDirector 6, GraphicsMagick and GameKit plugins requires Mac OS X 10.6. Also for SQL Plugin the built in SQLite library requires 10.6.

23.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all.

Answer: Look on the CPU family returned by sysctl:

Example:

Function is64bit() As Boolean

```
#if TargetLittleEndian
```

```
dim m as MemoryBlock = NewMemoryBlock(8)
```

```
dim family as Integer
```

```
dim s as string
```

```
m=SystemControlNameToMIBMBS("hw.cpufamily")
```

```
m=SystemControlMBS(m)
```

```
if m<>nil then
```

```
m.LittleEndian=True
```

```
family=m.Long(0)
```

```
const CPUFAMILY_INTEL_6_14 = &h73d67300 /* "Intel Core Solo" and "Intel Core Duo" (32-bit Pentium-M with SSE3) */
```

```
const CPUFAMILY_INTEL_6_15 = &h426f69ef /* "Intel Core 2 Duo" */
```

```
const CPUFAMILY_INTEL_6_23 = &h78ea4fbc /* Penryn */
```

```
const CPUFAMILY_INTEL_6_26 = &h6b5a4cd2 /* Nehalem */
```

```
Select case family
```

```
case CPUFAMILY_INTEL_6_14
```

```
Return false
```

```
case CPUFAMILY_INTEL_6_15
```

```
Return true
```

```
case CPUFAMILY_INTEL_6_23
```

```
Return true
```

```
case CPUFAMILY_INTEL_6_26
```

```
Return true
```

```
// newer CPUs may be missing here
```

```
end Select
```

```
end if
```

```
#endif
```

```
Return false
```

```
Exception
```

```
Return false
```

```
End Function
```

Notes: This code is written for Mac OS X where you only have a limited number of possible CPUs.

23.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Platform: Windows.

Answer: The following code will remove the close item from the system menu of the window.

Example:

```
#if TargetWin32 then
Declare Function GetSystemMenu Lib "user32" (hwnd as Integer, bRevert as Integer) as Integer
Declare Function RemoveMenu Lib "user32" (hMenu as Integer, nPosition as Integer, wFlags as Integer) as Integer
Dim hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, &HF060, &H0
#endif
```

Notes: The window may not be updated directly.

23.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
dim m as memoryBlock
dim n as Integer

m=GetEnvironmentStrings()

n=0
do
msgBox m.cstring(n)
while m.byte(n)<>0
n=n+1
wend
n=n+1
```

```
loop until m.byte(n)=0
#endif
```

Notes: The MBS Plugin has an EnvironmentMBS class for this.

23.0.40 How can i get similar behavior to Roxio Toast or iTunes where clicking a 'burn' button allows the next inserted blank CD-R to bypass the Finder and be accepted by my application?

Plugin Version: all, Platform: macOS.

Answer: You need to get a media reservation.

Example:

```
dim d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

Notes: Use the plugin function AcquireMediaReservation and later release it using ReleaseMediaReservation.

See plugin examples on how to use it and check Apples DiscRecording framework documentation for more details.

23.0.41 How can I get text from a PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Crossplatform you can use DynaPDF Pro.

Notes: On Mac OS X you can also use PDFKit for the same job.

While DynaPDF Pro gives you each bit of text with rotation, font information and encoding details, PDFKit gives you only the text string for a PDF page.

23.0.42 How can I get text from a Word Document?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: to get the text string from a doc file, use the NSAttributedStringMBS class.

Notes: The NSAttributedStringMBS class is Mac OS X only and we have currently no solution for Windows or Linux.

Use the `NSAttributedStringMBS initWithDocFormat(data as string)` as boolean method.

23.0.43 How can I get the item string for a given file creator?

Plugin Version: all.

Answer: Try this function:

Example:

```
Sub pullNativeDocs(aCREA As string)
Dim result as Integer
Dim m, k as memoryBlock
Dim f as folderItem
Dim newType as string
Dim anIcon As picture
Dim ofs as Integer
```

```
Declare Function GetFileTypesThatAppCanNativelyOpen Lib "Carbon" (appVRefNumHint as Short, appSignature as OSType, nativeTypes as Ptr) as Short Inline68K("701CABFC")
Declare Function GetDocumentKindString Lib "Carbon" (docVRefNum as Short, docType as OSType, docCreator as OSType, kindString as ptr) as Short Inline68K("7016ABFC")
```

```
listBox1.deleteAllRows
```

```
m = newMemoryBlock(1024)
result = GetFileTypesThatAppCanNativelyOpen(Volume(0).MacVRefNum, aCREA, m)
if result <> 0 then
listBox1.addRow "<Not found.>"
return
end if
```

```
do
if m.byte(ofs*4) = 0 then
exit
else
newType = m.OSTypeMBS(ofs*4)
listBox1.addRow newType
k = newMemoryBlock(64)
result = GetDocumentKindString(Volume(0).MacVRefNum, newType, aCREA, k)
if result = 0 then
listBox1.cell(ofs,1) = k.pString(0)
ofs = ofs + 1
else
listBox1.cell(ofs,1) = "(unknown)"
end if
end if
```

loop

End Sub

Notes: Change "Translation" to "CarbonLib" for Mac OS X.

23.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):

Example:

```
Function LaunchByCreator(C As String) As Boolean
Dim A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function
```

23.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please use the ldd command in the terminal.

Notes: You build an app on any platform, but for Linux.

For the resulting .so files in the libs folder, you can run the ldd command with the library path as parameter. It shows you references lib files and you can make sure you have those installed.

This is a sample run of our graphicsmagick plugin:

```
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$ ldd libMBSGraphicsMagickPlugin17744.so
linux-gate.so.1 =>(0xb76ee000)
libdl.so.2 =>/lib/i386-linux-gnu/libdl.so.2 (0xb6f0e000)
libgtk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgtk-x11-2.0.so.0 (0xb6aa6000)
libpthread.so.0 =>/lib/i386-linux-gnu/libpthread.so.0 (0xb6a8a000)
libstdc++.so.6 =>/usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
libm.so.6 =>/lib/i386-linux-gnu/libm.so.6 (0xb6979000)
libgcc_s.so.1 =>/lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
libc.so.6 =>/lib/i386-linux-gnu/libc.so.6 (0xb67b1000)
```

```

/lib/ld-linux.so.2 (0xb76ef000)
libgdk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
libpangocairo-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
libX11.so.6 =>/usr/lib/i386-linux-gnu/libX11.so.6 (0xb65c0000)
libXfixes.so.3 =>/usr/lib/i386-linux-gnu/libXfixes.so.3 (0xb65ba000)
libatk-1.0.so.0 =>/usr/lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 =>/usr/lib/i386-linux-gnu/libcairo.so.2 (0xb64ce000)
libgdk_pixbuf-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb64ad000)
libgio-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgio-2.0.so.0 (0xb6356000)
libpangoft2-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
libpango-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
libfontconfig.so.1 =>/usr/lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
libgobject-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb625c000)
libglib-2.0.so.0 =>/lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
libXext.so.6 =>/usr/lib/i386-linux-gnu/libXext.so.6 (0xb6151000)
libXrender.so.1 =>/usr/lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
libXinerama.so.1 =>/usr/lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
libXi.so.6 =>/usr/lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
libXrandr.so.2 =>/usr/lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
libXcursor.so.1 =>/usr/lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
libXcomposite.so.1 =>/usr/lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
libXdamage.so.1 =>/usr/lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
libfreetype.so.6 =>/usr/lib/i386-linux-gnu/libfreetype.so.6 (0xb607b000)
libxcb.so.1 =>/usr/lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
libpixman-1.so.0 =>/usr/lib/i386-linux-gnu/libpixman-1.so.0 (0xb5fc2000)
libpng12.so.0 =>/lib/i386-linux-gnu/libpng12.so.0 (0xb5f98000)
libxcb-shm.so.0 =>/usr/lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f93000)
libxcb-render.so.0 =>/usr/lib/i386-linux-gnu/libxcb-render.so.0 (0xb5f89000)
libz.so.1 =>/lib/i386-linux-gnu/libz.so.1 (0xb5f73000)
libgmodule-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgmodule-2.0.so.0 (0xb5f6e000)
libselinux.so.1 =>/lib/i386-linux-gnu/libselinux.so.1 (0xb5f4f000)
libresolv.so.2 =>/lib/i386-linux-gnu/libresolv.so.2 (0xb5f36000)
libexpat.so.1 =>/lib/i386-linux-gnu/libexpat.so.1 (0xb5f0c000)
libffi.so.6 =>/usr/lib/i386-linux-gnu/libffi.so.6 (0xb5f05000)
libpcre.so.3 =>/lib/i386-linux-gnu/libpcre.so.3 (0xb5ec9000)
librt.so.1 =>/lib/i386-linux-gnu/librt.so.1 (0xb5ec0000)
libXau.so.6 =>/usr/lib/i386-linux-gnu/libXau.so.6 (0xb5ebb000)
libXdmcp.so.6 =>/usr/lib/i386-linux-gnu/libXdmcp.so.6 (0xb5eb4000)
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$

```

As you see all library have been found and their load address is printed behind the name. If a library is missing, you usually see the address missing there or being zero.


```

while theRegexMatch <>nil
theStart = theRegexMatch.subExpressionStartB(0) + len(theRegexMatch.subExpressionString(0))

result = result + theRegexMatch.subExpressionString(1)
infoCharset = theRegexMatch.subExpressionString(2)
encodedPart = theRegexMatch.subExpressionString(4)
if theRegexMatch.subExpressionString(3) = "B" then
encodedPart = DecodeBase64(encodedPart)
elseif theRegexMatch.subExpressionString(3) = "Q" then
encodedPart = DecodeQuotedPrintable(encodedPart)
end if
if right(result, 1) = " " then
result = mid(result, 1, len(result)-1)
end if
encodedPart = encodedPart.DefineEncoding(GetInternetTextEncoding(infoCharset))
result = result + encodedPart

theRegex.SearchStartPosition = theStart
theRegexMatch = theRegex.search()
wend

result = result + mid(src, theStart+1)

else
result = src
end if
// theRegexMatch = theRegex.search

msgbox result

```

Notes: May not look nice depending on the controls used.
This is no longer needed when using MimeEmailMBS class which decodes for you.

23.0.48 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Platform: macOS.

Answer: Use the TabpanelEnabledMBS method.

Example:

```
TabpanelEnabledMBS(tabpanel1, 1, false)
```

Notes: Use Carbon for MachO and CarbonLib for Mac Carbon and AppearanceLib for Mac OS Classic as

library.

For Cocoa, please use enabled property of NSTabViewItemMBS class.

23.0.49 How do I find the root volume for a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```
Function GetRootVolume(f as FolderItem) as FolderItem
dim root, dum as folderItem
if f <> nil then
root = f // f might be the volume
do
dum = root.parent
if dum <> nil then
root = dum
end if
loop until dum = nil
return root
end if
End Function
```

23.0.50 How do I get the current languages list?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
dim p as new CFPReferencesMBS
dim a as CFArrayMBS
dim s as CFStringMBS
dim o as CFOBJECTMBS
dim sa(-1) as string

o=p.CopyAppValue("AppleLanguages", ".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

dim i,c as Integer
```

```
c=a.Count-1
for i=0 to c
o=a.Item(i)

if o isa CFStringMBS then
s=CFStringMBS(o)
sa.Append s.str
end if
next
end if

MsgBox Join(sa,EndOfLine)
```

Notes: On Mac OS X you can get the list of current languages like this list:

```
de
en
ja
fr
es
it
pt
pt-PT
nl
sv
nb
da
fi
ru
pl
zh-Hans
zh-Hant
ko
```

Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

23.0.51 How do I get the Mac OS Version?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

dim i as Integer
if system.gestalt("sysv", i) then
//do this in an 'If' in case you don't get any value back at all and system.gestalt returns boolean
if i = &h750 then //If OS is 7.5
//do stuff
elseif i = &h761 then //If OS is 7.6.1
//do stuff
end if
end if

```

Notes: The MBS Plugin has a function SystemInformationMBS.OSVersionString for this.

23.0.52 How do I get the printer name?

Plugin Version: all.

Answer: For Mac OS Classic see the code below and for Mac OS X use the Carbon Print Manager Classes from the MBS Plugin.

Example:

```

dim s as String
dim i as Integer

s=app.ResourceFork.GetResource("STR ",-8192)
if s<>"" then
i=ascb(leftb(s,1))
s=mid(s,2,i)

MsgBox s
end if

```

Notes: A note from Craig Hoyt:

After looking at your example I had a little deja-vu experience. Several years ago I played around with this same code if FutureBasic. I discovered that it did not and still doesn't provide the 'Printer Name', it does return the print driver name. If it returns 'LaserWriter 8' as the print driver you can look into this file and get the 'PAPA' resource #-8192 to get the actual Printer Name. Unfortunately this does not hold true for other printers. My Epson and HP Printers (the Epson has an Ethernet Card and the HP is USB) do not provide this info in their drivers. As far as I can tell it only returns the name by polling the printer itself.

23.0.53 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Platform: macOS.

Answer: The following declare turns any window on Mac OS X 10.2 or newer into a metal one.

Example:

```
declare sub ChangeWindowAttributes lib "Carbon" (win as windowptr, a as Integer, b as Integer)
```

```
ChangeWindowAttributes window1,256,0
```

Notes: May not look nice depending on the controls used.

23.0.54 How do I make a smooth color transition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I'd like to show in a report some bars, which start with color A and end with color B.

The color change should be very smooth.

My problem: If I would start from 255,0,0 and end by 0,0,0, I would have 255 different colors. If the bars are longer than 255 pixels, would this look nice?

Example:

```
// Window.Paint:
Sub Paint(g As Graphics)
dim w,w1,x,p as Integer
dim c1,c2,c as color
dim p1,p2 as Double

c1=rgb(255,0,0) // start color
c2=rgb(0,255,0) // end color

w=g.Width
w1=w-1

for x=0 to w1
p1=x/w1
p2=1.0-p1
```

```

c=rgb(c1.red*p1+c2.red*p2, c1.green*p1+c2.green*p2, c1.blue*p1+c2.blue*p2)

g.ForeColor=c
g.DrawLine x,0,x,g.Height

next
End Sub

```

Notes:

Try the code above in a window paint event handler.

23.0.55 How do I read the applications in the dock app?

Plugin Version: all, Platform: macOS.

Answer: Use CFPREFERENCESMBS class like in this example:

Example:

```

// Reads file names from persistent dock applications and puts them into the list

dim pref as new CFPREFERENCESMBS

dim persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
dim ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
dim tiledata as CFStringMBS = NewCFStringMBS("tile-data")
dim filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
dim o as CFOBJECTMBS = pref.CopyValue(persistentapps, ApplicationID, pref.kCFPreferencesCurrentUser,
pref.kCFPreferencesAnyHost)

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

// walk over all items in array
dim c as Integer = a.Count-1
for i as Integer = 0 to c

// get dictionary describing item
o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)

```

```

// and pick tile data dictionary
o = d.Value(tiledata)
if o isa CFDictionaryMBS then
d = CFDictionaryMBS(o)

// and pick there the file label
o = d.Value(filelabel)
if o isa CFStringMBS then
// and display it
dim name as string = CFStringMBS(o).str
List.AddRow name
end if
end if
end if

next

else
MsgBox "Failed to read dock preferences."
end if

```

Notes: You can use the `CFPreferencesMBS.SetValue` to change a value and `CFPreferencesMBS.Synchronize` to write the values to disc. You may need to restart the `Dock.app` if you modified things.

23.0.56 How do I truncate a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In a `binarystream` you can set the `length` property to truncate.

23.0.57 How do update a Finder's windows after changing some files?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

dim f as folderitem // some file
dim ae as appleevent
ae=newappleevent("fndr","fupd","MACS")
ae.folderitemparam("—")=f
if not ae.send then
//something went wrong

```

end if

Notes: The `folderitem.finderupdate` from the MBS Plugin does something like this.

23.0.58 How to access a USB device directly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: First, it depends on the device.

Notes: Some devices can be talked directly from user mode code, but some require a kernel driver.

For some devices you can use plugins to access them like:

- Audio and Video sources using the `QTGrabberClassMBS`
- Mass storage devices using the `folderitem` class.
- Serial devices using the `System.SerialPort` function.
- HID USB devices can be used with `MacHIDMBS`, `WinHIDMBS` or `LinuxHIDInterface` class.
- Any USB device may be used with `MacUSBMBS` or `WinUSBMBS` classes.

In general it is always the best to take the most high level access to have others do the work for the details.

23.0.59 How to add icon to file on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use `FolderItem.AddCustomIcon` or `NSWorkspaceMBS.setIcon` functions.

Notes: Please close any open stream for the file you want to add an icon.

23.0.60 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Platform: macOS.

Answer: Using Apple Events you can use this code:

Example:

Function `Computername()` *As string*

```

dim theEvent as AppleEvent
dim err as boolean

theEvent = newAppleEvent("mchn","getd","MACS")

err = theEvent.send

return theevent.ReplyString

End Function

```

Notes: Code above is for Mac OS 9!

Also the MBS Plugin has a function for this which may be faster and work also on Macs without Filesharing (which handles this event).

23.0.61 How to automatically enable retina in my apps?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSHighResolutionCapable""
YES")

```

Notes: This will set the NSHighResolutionCapable flag to YES.

23.0.62 How to avoid leaks with Cocoa functions?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```

// in a Timer Action event:
Sub Action()
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

```

```

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS

```

End Sub

Notes: With Xojo 2009r4 the code above should not be needed as Xojo runtime does automatically handle the `NSAutoreleasePools` for you. For older Xojo versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use Xojo 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a `objc_msgSend` call.

23.0.63 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Platform: macOS.

Answer: For oracle the most important thing is to point the plugin to the libraries from oracle.

Notes: In environment variables, the paths like `ORACLE_HOME` must be defined.

On Mac OS X you also need to define `DYLD_LIBRARY_PATH` to point to the dylib files from oracle.

For that you need to modify `/etc/launchd.conf` for Mac OS X 10.8 and newer.

In older versions those variables in `.MacOSX/environment.plist` file in user's home.

Another way for the case you bundle things inside your app is to use the `LSEnvironment` key in `info.plist`. In `info.plist` it looks like this:

```
<key>LSEnvironment</key>
<dict>
<key>test</key>
<string>Hello World</string>
</dict>
```

23.0.64 How to avoid `___NSAutoreleaseNoPool` console messages in threads?

Plugin Version: all, Platform: macOS.

Answer: You need to use your own `NSAutoreleasePool` on a thread like this:

Example:

```
sub MyThread.run
dim pool as new NSAutoreleasePoolMBS
// do work here

pool=nil
```

end sub

Notes: For more details read here:

http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutoreleasePool_Class/Reference/Reference.html

23.0.65 How to bring app to front?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use this code:

Example:

```
// First way:
```

```
app.FrontMostMBS = true
```

```
// second way:
```

```
dim p as new ProcessMBS
```

```
p.GetCurrentProcess
```

```
p.FrontProcess = true
```

```
// third way:
```

```
NSApplicationMBS.sharedApplication.activateIgnoringOtherApps(true)
```

```
// for Windows:
```

```
RemoteControlMBS.WinBringWindowToTop
```

Notes: This will bring a Mac app to the front layer.

23.0.66 How to bring my application to front?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code txtxt) to the frontmost application:

Example:

```
Dim A As AppleEvent
```

```
A = NewAppleEvent("misc", "actv", "")
```

```
If Not A.Send then
```

```
Beep
```

```
end if
```

Notes: (Code is Mac only)

23.0.67 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use SignalHandlerMBS class for this.

Example:

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

dim ende as boolean = false
do
if SignalHandlerMBS.IsFlagSet(2) then
Print "Flag 2 set. Existing..."
ende = true
end if

DoEvents 1
loop until ende
```

Notes: The signal is caught, a flag is set and you can ask later in your normal application flow for the result.

23.0.68 How to change name of application menu?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use this code to change the application menu name on Mac OS X:

Example:

```
dim mb as new MenubarMBS
dim m as MenuMBS = mb.item(1) // 1 is in my tests the app menu
if m<>Nil then
m.MenuTitle = "Hello World"
end if
```

Notes: This code is for Carbon only.

23.0.69 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer:

You mean it screws up if the file name of the bundle itself is different than the name of the executable file in the MacOS folder within the bundle? If so, you should find something like this within your Info.plist file (or the 'plst' resource that the RB IDE builds for you):

```
<key>CFBundleExecutable</key>
<string>Executable file name here</string>
```

Just make sure that file name matches.

However, if your question involves how you can change the name of the app that appears in the menu and the dock, that's different. You can make this name different from the file name by changing the CFBundleName key:

```
<key>CFBundleName</key>
<string>Name for menu here</string>
```

Note that if you use my free AppBundler program, this second part is taken care of for you – just fill in a custom name in the right field. You can find AppBundler (from Thomas Reed) at <http://www.bitjuggler.com/products/appbundler/>.

23.0.70 How to check if a folder/directory has subfolders?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this to check all items in a folder:

Example:

```
Function HasSubFolder(folder as FolderItem) As Boolean
dim c as Integer = folder.Count
```

```
for i as Integer = 1 to c
dim item as FolderItem = folder.TrueItem(i)
```

```
if item<>Nil and item.Directory then
Return true
end if
```

next

End Function

Notes: We use trueitem() here to avoid resolving alias/link files. Also we check for nil as we may not have permission to see all items. And if one is a directory, we return without checking the rest.

23.0.71 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Platform: macOS.

Answer: Please use our IOPowerSourcesMBS class like this:

Example:

```
Function PowerSourceState() as Integer
dim p as new IOPowerSourcesMBS

// check all power sources
dim u as Integer = p.Count-1
for i as Integer = 0 to u
dim d as CFDictionaryMBS = p.Item(i)
if d<>nil then
// check if they have a power source state key:
dim o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
if o isa CFStringMBS then
dim s as string = CFStringMBS(o).str

'MsgBox s

if s = "AC Power" then
Return 1
elseif s = "Battery Power" then
Return 2
end if
end if
end if
next
Return 0 // unknown
End Function
```

Notes: If you want to check the CFDictionaryMBS content, simply use a line like "dim x as dictionary = d.dictionary" and check the contents in the debugger.

23.0.72 How to check if Microsoft Outlook is installed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you need Outlook for Scripting, you should simply check registry for the required Outlook.Application class:

Example:

```
Function OutlookInstalled() As Boolean
    #if TargetWin32 then

    try
    dim r as new RegistryItem("HKEY_CLASSES_ROOT\Outlook.Application\CLSID", false)

    Return true

    catch r as RegistryAccessErrorException
    // not installed
    Return false

    end try

    #else

    // Windows only, so false on other platforms
    Return false

    #endif

End Function
```

23.0.73 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Platform: macOS.

Answer: The code below returns a country value.

Example:

```
dim result as Integer

IF TargetMacOS THEN
```

```

CONST smScriptLang = 28
CONST smSystemScript = -1

DECLARE FUNCTION GetScriptManagerVariable LIB "Carbon" ( selector as Integer) as Integer
DECLARE FUNCTION GetScriptVariable LIB "Carbon" ( script as Integer, selector as Integer) as Integer

result=GetScriptVariable(smSystemScript, smScriptLang)

END IF

```

Notes: Returns values like:

For more values, check "Script.h" in the frameworks.

23.0.74 How to code sign my app with plugins?

Plugin Version: all, Platform: macOS.

Answer: When you try to code sign the application with plugin dylibs on Mac OS X, you may see error message that there is actually a signature included.

Notes: Please use the `-f` command line parameter with `codesign` utility to overwrite our MBS signature. We sign our plugins for MacOS, iOS and Windows to make sure they have not been modified.

In terminal, you do like this:

```

cd <Path to folder of app>

xattr -cr <Appname>.app
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.dylib
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.framework
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app

```

Please use the name of your certificate (See keychain), the name of your app and the path to the app folder. If you have helper apps you need to sign them first.

You can use a build step to automatically sign your app on build.

23.0.75 How to collapse a window?

Plugin Version: all, Platform: macOS.

Answer: Use this function (Mac only):

Example:

```
Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
dim state, err as Integer
dim wh as MemoryBlock
```

```
Declare Function CollapseWindow Lib "Carbon" (window as Integer, collapse as Integer) as Integer
```

```
IF CollapseStatus THEN
state = 1
ELSE
state = 0
END IF
```

```
err = CollapseWindow(w.MacWindowPtr, state)
```

```
End Sub
```

Notes: Also the MBS Plugin has a window.collapsedmbs property you can set. For Windows the MBS Plugin has a window.isiconicmbs property.

23.0.76 How to compare two pictures?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:

Example:

```
Function ComparePictures(p as picture,q as picture) as Integer
dim r,u as RGBSurface
dim x,y,n,m,h,w as Integer
dim w1,w2,h1,h2,d1,d2 as Integer
dim c1,c2 as color
```

```
h1=p.Height
h2=q.Height
w1=p.Width
w2=q.Width
d1=p.Depth
d2=q.Depth
```

```
if d1<>d2 then
Return 1
elseif w1<>w2 then
```

```

return 2
elseif h1<>h2 then
Return 3
else
r=p.RGBSurface
u=q.RGBSurface

if r=nil or u=nil then
Return -1
else
h=h1-1
w=w1-1
m=min(w,h)

for n=0 to m
c1=r.Pixel(n,n)
c2=u.Pixel(n,n)
if c1<>c2 then
Return 4
end if
next

for y=0 to h
for x=0 to w
c1=r.Pixel(x,y)
c2=u.Pixel(x,y)
if c1<>c2 then
Return 5
end if
next
next

// 0 for equal
// -1 for error (no RGBsurface)
// 1 for different depth
// 2 for different width
// 3 for different height
// 4 for different pixels (fast test)
// 5 for different pixels (slow test)
end if
end if

Exception
Return -1
End Function

```

Notes: Remember that this only works on bitmap pictures, so the `picture.BitmapMBS` function may be useful.

23.0.77 How to compile PHP library?

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: This instructions were written based on PHP 5.2.6 on Mac OS X:

- Best take a new Mac with current Xcode version installed.
- Download the source code archive. e.g. "php-5.2.6.tar.bz2"
- Expand that archive on your harddisc.
- Open terminal window
- change directory to the php directory. e.g. "cd /php-5.2.6"
- execute this two lines to define the supported CPU types and the minimum Mac OS X version:
- export CFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- export CXXFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- the command "./configure help" does show the configure options.
- use configure with a line like this:
- ./configure --enable-embed --with-curl --enable-ftp --enable-zip --enable-sockets --enable-static --enable-soap --with-zlib --with-bz2 --enable-exif --enable-bcmath --enable-calendar
- start the compilation with "make all"
- other option is to use "make install" which first does the same as "make all" and than does some installation scripts.
- you may get an error about a duplicate symbole __yytext. Search the file "zend_ini_scanner.c", search a line with "char *yytext;" and change it to "extern char *yytext;"
- On the end you get a lot of error messages, but you have a working library (named libphp5.so) file in the invisible ".libs" folder inside your php source folder.

Possible problems and solutions:

- If the path to your files has spaces, you can get into trouble. e.g. "/RB Plugins/PHP" is bad as files will be searched sometimes in "/RB".

- If you have in /usr/local/lib libraries which conflict with the default libraries, you can get into trouble.
- If you installed some open source tools which compiled their own libraries, you can get into conflicts.
- if you have to reconfigure or after a problem, you may need to use "make clean" before you start "make all" again.

Feel free to install additional libraries and add more packages to the configure line.

23.0.78 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
case WebSession.BrowserType.Android
Return "Andriod"
case WebSession.BrowserType.Blackberry
Return "Blackberry"
case WebSession.BrowserType.Chrome
Return "Chrome"
case WebSession.BrowserType.ChromeOS
Return "ChromeOS"
case WebSession.BrowserType.Firefox
Return "Firefox"
case WebSession.BrowserType.InternetExplorer
Return "InternetExplorer"
case WebSession.BrowserType.Opera
Return "Opera"
case WebSession.BrowserType.Safari
Return "Safari"
case WebSession.BrowserType.SafariMobile
Return "SafariMobile"
case WebSession.BrowserType.Unknown
Return "Unknown"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

23.0.79 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetRenderingEngineName(s as WebSession.EngineType) As string
Select case s
case WebSession.EngineType.Gecko
Return "Gecko"
case WebSession.EngineType.Presto
Return "Presto"
case WebSession.EngineType.Trident
Return "Trident"
case WebSession.EngineType.Unknown
Return "Unknown"
case WebSession.EngineType.WebKit
Return "WebKit"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

23.0.80 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetPlatformName(s as WebSession.PlatformType) As string
Select case s
case WebSession.PlatformType.Blackberry
Return "Blackberry"
case WebSession.PlatformType.iPad
Return "iPad"
case WebSession.PlatformType.iPhone
Return "iPhone"
case WebSession.PlatformType.iPodTouch
Return "iPodTouch"
case WebSession.PlatformType.Linux
Return "Linux"
case WebSession.PlatformType.Macintosh
Return "Macintosh"
```

```

case WebSession.PlatformType.PS3
Return "PS3"
case WebSession.PlatformType.Unknown
Return "Unknown"
case WebSession.PlatformType.WebOS
Return "WebOS"
case WebSession.PlatformType.Wii
Return "Wii"
case WebSession.PlatformType.Windows
Return "Windows"
else
Return "Unkown: "+str(integer(s))
end Select

```

End Function

23.0.81 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

dim outstring as string
dim theMac, thePC as textencoding
dim Mac2PC as textconverter

theMac = getTextEncoding(0) // MacRoman
thePC = getTextEncoding(&h0201) // ISOLatin1

Mac2PC = getTextConverter(theMac, thePC)
// if you wanted to do the opposite just create a converter
// PC2Mac = getTextConverter(thePC, theMac)

outstring = Mac2PC.convert("Bj√rn, this text should be converted")
Mac2PC.clear

```

Notes:

You have to call Mac2PC.clear after every conversion to reset the encoding engine.
See also newer TextConverterMBS class.

23.0.82 How to convert ChartTime back to Xojo date?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have this example code:

Example:

```
Function ChartTimeToDate(ChartTime as Double) As date
static diff as Double = 0.0
```

```
if diff = 0.0 then
dim d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
dim da as new date(2015, 1, 1)
dim ts as Double = da.TotalSeconds
```

```
diff = ts - d2
end if
```

```
dim d as new date
d.TotalSeconds = diff + ChartTime
```

```
Return d
End Function
```

Notes: As you see we calculate the difference in base date from Date and ChartTime and later use difference to convert.

23.0.83 How to convert line endings in text files?

Plugin Version: all, Platform: macOS.

Answer: You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.

Example:

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
dim it as TextInputStream = TextInputStream.Open(inputfile)
dim ot as TextOutputStream = TextOutputStream.Create(outputfile)
```

```
ot.Delimiter = EndOfLine.Windows // new line ending
while not it.EOF
ot.WriteLine it.ReadLine
wend
```

Notes: `TextInputStream` will read any input line endings and with `delimiter` property in `TextOutputStream` you can easily define your new delimiter.

23.0.84 How to convert picture to string and back?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use this plugin functions:

Notes: JPEG:

`JPEGStringToPictureMBS(buf as string)` as picture
`JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean)` as picture
`PictureToJPEGStringMBS(pic as picture,quality as Integer)` as string

PNG:

`PictureToPNGStringMBS(pic as picture, gamma as single)` as string
`PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single)` as string
`PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer)` as string
`PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer)` as string
`PNGStringToPictureMBS(data as string, gamma as single)` as picture
`PNGStringToPNGPictureMBS(data as string, gamma as single)` as PNGpictureMBS

Tiff:

`TIFFStringToPictureMBS(data as string)` as picture
`TIFFStringToTiffPictureMBS(data as string)` as TiffPictureMBS

BMP:

`BMPStringtoPictureMBS(data as string)` as picture
`Picture.BMPDataMBS(ResolutionValueDPI as Integer=72)` as string

GIF:

`GifStringToGifMBS(data as string)` as GIFMBS
`GifStringToPictureMBS(data as string)` as Picture

23.0.85 How to copy an array?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy an array:

Example:

```
Function CopyArray(a() as Double) as Double()
dim r() as Double
for each v as Double in a
r.Append v
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double. For a deep copy of an array of objects, you need to change code to also make a copy of those objects.

23.0.86 How to copy an dictionary?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy a dictionary:

Example:

```
Function CopyDictionary(d as Dictionary) As Dictionary
dim r as new Dictionary
for each key as Variant in d.keys
r.Value(key) = d.Value(key)
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double. For a deep copy of an dictionary of objects, you need to change code to also make a copy of those objects.

23.0.87 How to copy parts of a movie to another one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.

Example:

```

dim f as FolderItem
dim md as EditableMovie
dim ms as EditableMovie

f=SpecialFolder.Desktop.Child("Our First Snowman.mov")
ms=f.OpenEditableMovie

ms.SelectionStartMBS=5
ms.SelectionLengthMBS=10

f=SpecialFolder.Desktop.Child("dummy.mov")
md=f.CreateMovie

msgbox str(md.AddMovieSelectionMBS(ms))

```

Notes: If result is not 0, the method fails.

23.0.88 How to create a birthday like calendar event?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every
year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

dim calendars() as CalCalendarMBS = s.calendars

```

```

// set properties
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(0) // add to first calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if

```

Notes: This adds an event to iCal for the given date with alarm to remember you and repeats it every year.

23.0.89 How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the UUIDMBS class for this.

23.0.90 How to create a Mac picture clip file?

Plugin Version: all, Platform: Windows.

Answer: You can use code like this one.

Example:

```

dim f As FolderItem
dim p As Picture

f=SpecialFolder.Desktop.Child("Test.pictClipping")
if f=nil then Return

p=new Picture(300,200,32) 'Make a sample picture
p.Graphics.ForeColor=RGB(0,255,255)
p.Graphics.FillOval 0,0,99,99

```

```
p.Graphics.ForeColor=RGB(255,0,0)
p.Graphics.DrawOval 0,0,99,99
```

```
dim r As ResourceFork 'ResourceFork is needed for a clip file
```

```
// Please define a file type Any
r=f.CreateResourceFork("Any")
```

```
// get PICT data using plugin function
dim pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")
```

```
dim m as new MemoryBlock(8)
```

```
m.LittleEndian = false
m.Int16Value(0) = 0
m.Int16Value(2) = 0
m.Int16Value(4) = p.Width
m.Int16Value(6) = p.Height
```

```
r.AddResource(m,"RECT",256,"")
```

```
'Values taken from a sample file and irrelevant to the problem
```

```
dim data as string = DecodeBase64("AQAAAAAAAAAAAAAAAAACAFRDRVIAAABAAAAAAAAAAABUQ0IQAAAAA")
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

23.0.91 How to create a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check our DynaPDF plugin and the examples.

Notes: An alternative can be to use the CoreGraphics and Cocoa functions on Mac OS X. For Windows, we can only suggest our DynaPDF plugin.

23.0.92 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Platform: macOS.

Answer: You can use code like the one below:

Example:

Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
 dim a as new EmailAttachment

```
a.data = EncodeBase64(PDFData, 76)
a.ContentEncoding = "base64"
a.MIMEType = "application/pdf"
a.MacType = "PDF "
a.MacCreator = "prvw"
a.Name = filename
```

Return a

End Function

Notes: Compared to sample code from Xojo documentation, we set the mime type correct for PDF. The MacType/MacCreator codes are deprecated, but you can still include them for older Mac email clients. "prvw" is the creator code for Apple's preview app.

23.0.93 How to create PDF for image files?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use DynaPDF like this:

Example:

```
Function CreatePrintPDF(jpgFiles() as folderitem, pdfFile as FolderItem, PageWidth as Integer, PageHeight as Integer) As Boolean
  // have files?
  If pdfFile = Nil Then Return False
  If jpgFiles = Nil Then Return False

  If jpgFiles.Ubound < 0 Then Return False

  // new DynaPDF
  Dim pdf As New MyDynapdfMBS

  // page width/height in MilliMeter
  Dim pdfWidth as Integer = PageWidth * 72 / 25.4
  Dim pdfHeight as Integer = PageHeight * 72 / 25.4

  // put your license here
  Call pdf.SetLicenseKey "Starter"

  // create pdf
  Call pdf.CreateNewPDF pdfFile
```

```

// set a couple of options
Call pdf.SetPageCoords(MyDynaPDFMBS.kpcTopDown)
Call pdf.SetResolution(300)
Call pdf.SetUseTransparency(False)
Call pdf.SetSaveNewImageFormat(False)
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
Call pdf.SetJPEGQuality(100)

// set page size
Call pdf.SetBBox(MyDynaPDFMBS.kpbMediaBox, 0, 0, pdfWidth, pdfHeight)
Call pdf.SetPageWidth(pdfWidth)
Call pdf.SetPageHeight(pdfHeight)

// append pages with one image per page
For i as Integer = 0 To jpgFiles.Ubound
Call pdf.Append
Call pdf.InsertImageEx(0, 0, pdfWidth, pdfHeight, jpgFiles(i), 1)
Call pdf.EndPage
Next

// close
Call pdf.CloseFile

Return True
End Function

```

Notes: This is to join image files in paper size to a new PDF.
e.g. scans in A4 into an A4 PDF.

23.0.94 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a few tips on how to translate command line CURL calls to plugin calls.

Notes: `curl -vX PUT http://localhost:5984/appserials/78569238475/DocumentRegister.docx?rev=3-25634563456 -data-binary @DocumentRegister.docx -H "Content-Type: application/msword"`

- The option `-v` means verbose. You can use `OptionVerbose` and listen for messages in the `DebugMessage` event.
- The option `-X PUT` means we want to do a HTTP PUT Request. So set `OptionPut` to true. Also you will want to set `OptionUpload` to true as you upload data.
- We have the URL which you put into `OptionURL` property.

- The `-data-binary` option tells CURL to pass the given data. With the `@` before the data, it is interpreted as a file name, so the data is read from the given file. You'll need to open this file and pass data with the Read event as needed. (See CURLS ftp file upload example project)
- The last option `-H` specifies an additional header for the upload. Pass this additional header with the `SetOptionHTTPHeader` method.

```
curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfc4328001c59 -d '{ "type": "Product", "description": "Application Serial", "acronym": "AppSerial", "dateAdded": "2011-03-21 14:57:36" } '
```

- Option `-X PUT` like above.
- Pass the URL again in `OptionURL`
- This time data is passed in command line for CURL. You'd put this data in the quotes into a string and make it available in the Read event. (See CURLS ftp upload example project)

23.0.95 How to delete file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
dim d as CURLMBS // your curl object
```

```
// delete file
```

```
dim ws() As String
```

```
ws.Append "DELE Temp.txt"
```

```
d.SetOptionPostQuote(ws)
```

Notes: Use `SetOptionPostQuote`, `SetOptionPreQuote` or `SetOptionQuote`.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. To delete use `DELE` and the file path.

23.0.96 How to detect display resolution changed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X simply listen for display changed notifications.

Notes: Use the "Distribution Notification Center.rbp" example project as a base and use it to listen to notifications with the name "O3DeviceChanged".

23.0.97 How to detect retina?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use `Window.BackingScaleFactorMBS` to query the factor.

Example:

```
msgbox str(window1.BackingScaleFactorMBS)
```

23.0.98 How to disable force quit?

Plugin Version: all, Platform: macOS.

Answer:

Please visit this website and get the control panel for Mac OS 9 there:

<http://www3.sk.sympatico.ca/tinyjohn/DFQ.html>

For Mac OS X use the MBS Plugin with the `SetSystemUIModeMBS` method.

Notes:

Please use `presentationOptions` in `NSApplicationMBS` for Cocoa applications.

23.0.99 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Platform: Windows.

Answer: You can use this code in the `htmlviewer` open event:

Example:

```
if targetwin32 then
htmlviewer1._ole.Content.value("Silent") = True
end if
```

Notes: This disables the error dialogs from Internet Explorer.

23.0.100 How to display a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X you can use CoreGraphics or PDFKit to display a PDF.

Notes: An alternative can be to load the PDF into a htmlviewer so the PDF plugin can display it. On Windows you may need to use the Acrobat ActiveX control from Adobe or launch Acrobat Reader.

23.0.101 How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```
Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next

' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub
```



```

b=true
x=x1
while (x<x2) and (y<y2)
  ox=x
  oy=y

  x=x+dx
  y=y+dy

  if b then
    g.DrawLine ox,oy,x,y
  end if

  b=not b
wend

```

End Sub

Notes: It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

23.0.104 How to draw a nice antialiased line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

Sub drawLine(xs as Integer, ys as Integer, xe as Integer, ye as Integer, face as RGBSurface, lineColor as
color)
  dim intX, intY, count, n, xDiff, yDiff as Integer
  dim v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
  dim c as color

  const st=1.0

  xDiff=xe-xs
  yDiff=ye-ys
  count=max(abs(xDiff), abs(yDiff))
  xStep=xDiff/count
  yStep=yDiff/count

```

```

xx=xs
yy=ys
for n=1 to count
intX=xx
intY=yy
floatX=xx-intX
floatY=yy-intY

v=(1-floatX)*(1-floatY)*st
v1=1-v
c=face.pixel(intX, intY)
face.pixel(intX, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*(1-floatY)*st
v1=1-v
c=face.pixel(intX+1, intY)
face.pixel(intX+1, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=(1-floatX)*floatY*st
v1=1-v
c=face.pixel(intX, intY+1)
face.pixel(intX, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*floatY*st
v1=1-v
c=face.pixel(intX+1, intY+1)
face.pixel(intX+1, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)

xx=xx+xStep
yy=yy+yStep
next

End Sub

```

Notes:

PS: st should be 1 and face should be a RGBSurface or a Graphics object.

23.0.105 How to dump java class interface?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.

Notes: For example show ResultSet class: javap -s java.sql.ResultSet

23.0.106 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this function:

Example:

```
Function Duplicate(extends p as Picture) As Picture
  #if RBVersion >= 2011.04 then
  if p.HasAlphaChannel then

    // create nw picture and copy content:
    dim q as new Picture(p.Width, p.Height)
    q.Graphics.DrawPicture p,0,0

  Return q

  end if
  #endif

  // create new picture
  dim q as new Picture(p.Width, p.Height, 32)

  // get mask
  dim oldMask as Picture = p.mask(false)
  if oldMask = nil then
    // no mask, so simple copy
    q.Graphics.DrawPicture p,0,0
    Return q
  end if

  // remove mask
  p.mask = nil

  // copy picture and mask
  q.Graphics.DrawPicture p, 0, 0
  q.mask.Graphics.DrawPicture oldMask,0,0

  // restore mask
  p.mask = oldmask

  Return q
End Function
```

Notes: Simply copy it to a module and call it like this: `q = p.duplicate`.

The code above works with old Xojo versions because of the `#if` even if your RS version does not support alpha channel pictures. This way it's future proof.

23.0.107 How to enable assistive devices?

Plugin Version: all, Platform: macOS.

Answer: You can use AppleScript code like below:

Notes: tell application "System Events"
activate

```
set UI elements enabled to true
```

```
return UI elements enabled
end tell
```

You can run this with AppleScriptMBS class.

23.0.108 How to encrypt a file with Blowfish?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")
```

```
// read input
```

```
dim bi as BinaryStream = BinaryStream.Open(fi)
```

```
dim si as string = bi.Read(bi.Length)
```

```
bi.Close
```

```
// encrypt
```

```
dim so as string = BlowfishMBS.Encrypt("MyKey",si)
```

```
// write output
```

```
dim bo as BinaryStream = BinaryStream.Create(fo)
```

```
bo.Write so
```

```
bo.Close
```

Notes: Of course you can decrypt same way, just use Decrypt function and of course swap files.

23.0.109 How to extract text from HTML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:

Example:

```
dim html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)
```

MsgBox text // shows: Gr√üë

Notes: You can use it together with RemoveHTMLTagsMBS to remove html tags. What you get will be the text without tags.

DecodingFromHTMLMBS turns HTML escapes back to unicode characters. Like ä to √§.

23.0.110 How to find empty folders in a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this code:

Example:

```
dim folder as folderitem // your folder

dim c as Integer = folder.count
for i as Integer = 1 to c
dim item as folderitem = folder.trueitem(i)
if item = nil then
// ignore
elseif item.directory then
// folder
if item.count = 0 then
// found empty folder
end if
end if
next
```

23.0.111 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Platform: macOS.

Answer: You can try Launch Services.

Example:

```
dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.NativePath
```

23.0.112 How to find network interface for a socket by it's name?

Plugin Version: all, Platform: macOS.

Answer: You can use our plugin to build a lookup table.

Example:

```
Function FindNetworkInterface(name as string) As NetworkInterface
name = name.trim

if name.len = 0 then Return nil

// search by IP/MAC
dim u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if n.IPAddress = name or n.MACAddress = name then
Return n
end if
next

// use MBS Plugin to build a mapping
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
dim map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
dim IPv4s() as string = n.IPv4s
dim IPv6s() as string = n.IPv6s

for each IPv4 as string in IPv4s
map.Value(IPv4) = n.Name
next
for each IPv6 as string in IPv6s
map.Value(IPv6) = n.Name
next
if n.MAC<>>" then
map.Value(n.MAC) = n.Name
```

```

end if
next

// now search interfaces by name, IPv4 or IPv6
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if map.Lookup(n.IPAddress, "") = name then
Return n
end if

if map.Lookup(n.MACAddress, "") = name then
Return n
end if
next

End Function

```

Notes: The code above uses a lookup table build using NetworkInterfaceMBS class to find the network interface by name.

23.0.113 How to find version of Microsoft Word?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```

// find Word
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.microsoft.Word", "")

// open bundle
dim c as new NSBundleMBS(f)

// read info
dim d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion", "")

```

Notes: Older versions of Word can be found with creator code "MSWD".

23.0.114 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Platform: macOS.

Answer: You probably connect with SSL and you have no valid certificate.

Example:

```
dim d as new CURLSMBS

// Disable SSL verification
d.OptionSSLVerifyHost = 0 // don't verify server
d.OptionSSLVerifyPeer = 0 // don't proofs certificate is authentic

// With SSL Verification:
dim cacert as FolderItem = Getfolderitem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2 // verify server
d.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
```

Notes: You can either use the code above to disable the SSL verification and have no security. Or you use the cacert file and enable the verification. Than you only get a connection if the server has a valid certificate.

see also:

<http://curl.haxx.se/ca/>

23.0.115 How to format double with n digits?

Plugin Version: all, Platform: macOS.

Answer: You can use the FormatMBS function for this.

Example:

```
dim d as Double = 123.4567890
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

d = 0.000000123456
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
```

```
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)
```

Notes: see FormatMBS for details.

In general %f is normal style, %e is scientific and %g is whichever gives best result for given space.

23.0.116 How to get a time converted to user time zone in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.GMTOffset property.

Example:

```
Sub Open()
// current date on server
dim d as new date
dim s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

dim t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

23.0.117 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: This function returns a handle for the frontmost window:

Example:

```
Function GetForegroundWindowHandle() as Integer
#if targetwin32 then
declare function GetForegroundWindow Lib "user32.dll" as Integer
Return GetForegroundWindow()
#endif
End Function
```

23.0.118 How to get CFAbsoluteTime from date?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use code like this:

Example:

```
dim d as new date
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim g as new CFGregorianCalendarMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

dim at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
dim x as Double = at.Value
```

```
MsgBox str(x)
```

Notes: As you see we need a timezone and put the date values in a gregorian date record. Now we can query absolute time for the given timezone.

23.0.119 How to get client IP address on web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.RemoteAddress property.

Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

23.0.120 How to get fonts to load in charts on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `SetFontSearchPath` method in the `CDBaseChartMBS` class to specify where your fonts are.

Example:

```

if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if

// also you can later switch default fonts:

dim Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf", "/usr/share/fonts/truetype/piboto/Pi
#EndIf

```

Notes: On macOS, iOS and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the `ttf-mscorefonts-installer` package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

23.0.121 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `AddFontSearchPath` method in the `DynaPDFMBS` class to specify where your fonts are.

Example:

```

dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if

```

Notes: On Mac OS X and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the `ttf-mscorefonts-installer` package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

23.0.122 How to get GMT time and back?

Plugin Version: all, Platform: macOS.

Answer: You can use the date class and the GMTOffset property.

Example:

```
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds,"0.0")+ " " +str(e.TotalSeconds, "0.0")

dim GMTTimeStamp as Double = e.TotalSeconds

// restore
dim f as new date

// add GMT offset here
f.TotalSeconds = GMTTimeStamp + f.GMTOffset*3600
// because here it's removed
f.GMTOffset = f.GMTOffset

MsgBox d.ShortTime+" (" +str(d.GMTOffset)+") " +str(d.TotalSeconds,"0.0")+EndOfLine+_
e.ShortTime+" (" +str(e.GMTOffset)+") " +str(e.TotalSeconds,"0.0")+EndOfLine+_
f.ShortTime+" (" +str(f.GMTOffset)+") " +str(f.TotalSeconds,"0.0")
```

Notes: It's sometimes a bit tricky with the date class as setting one property often changes the others.

23.0.123 How to get good crash reports?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check this website from the webkit website:

Notes: <http://webkit.org/quality/crashlogs.html>

23.0.124 How to get list of all threads?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the runtime module like in this function:

Example:

```
Function Threads() As Thread()
#pragma DisableBackgroundTasks
dim t() as Thread

Dim o as Runtime.ObjectIterator=Runtime.IterateObjects
While o.MoveNext
if o.Current isa Thread then
t.Append thread(o.current)
end if
Wend

Return t
End Function
```

Notes: This returns an array of all thread objects currently in memory.

The pragma is important here as it avoids thread switches which may cause a thread to be created or deleted.

23.0.125 How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the Webpage.ParametersReceived event.

Example:

```
Sub ParametersReceived(Variables As Dictionary)
for each key as Variant in Variables.keys
MsgBox key+" ->" +Variables.Value(key)
next
End Sub
```

Notes: The text encodings of this strings is not defined in Xojo 2010r5. Please use DefineEncoding.

23.0.126 How to get the color for disabled textcolor?

Plugin Version: all, Platform: macOS.

Answer: Ask the appearance manager:

Example:

```
Function GetThemeTextColor(inColor as Integer, inDepth as Integer, inColorDev as Boolean) As Color
declare function GetThemeTextColor lib "Carbon" (inColor as Integer, inDepth as Integer, inColorDev as
Boolean, outColor as Ptr) as Integer
```

```
dim i as Integer
```

```
dim col as MemoryBlock
```

```
col = newMemoryBlock(6)
```

```
i = GetThemeTextColor(inColor, inDepth, inColorDev, col)
```

```
return RGB(col.UShort(0)\256, col.UShort(2)\256, col.UShort(4)\256)
```

```
End Function
```

Notes: The color for this is:

```
const kThemeTextColorDialogInactive = 2.
```

```
c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)
```

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

23.0.127 How to get the current free stack space?

Plugin Version: all, Platform: macOS.

Answer: You can something like the code below:

Example:

```
Sub ShowStackSize()
```

```
dim threadid as Integer
```

```
dim size as Integer
```

```
declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
```

```
declare function ThreadCurrentStackSize lib "Carbon" (threadid as Integer, byref size as Integer) as short
```

```
if GetCurrentThread(threadid)=0 then
```

```
if 0=ThreadCurrentStackSize(threadid,size) then
```

```
MsgBox str(size)
```

```
end if
```

```
end if
```

End Sub

Notes: For Mac OS 9, use "ThreadLib" instead of "CarbonLib". You can use #if if you like for that.

23.0.128 How to get the current timezone?

Plugin Version: all, Platforms: macOS, Windows.

Answer:

You can use the TimeZoneMBS class or the CFTimeZoneMBS class.
Or code like below:

Example:

```
Function GMTOffsetInMinutes() as Integer
// Returns the offset of the current time to GMT in minutes.
// supports Mac OS and Windows, but not Linux yet (let me know if
// you have code for that, please)
//
// Note that the offset is not always an even multiple of 60, but
// there are also half hour offsets, even one 5:45h offset

// This version by Thomas Tempelmann (rb@tempel.org) on 25 Nov 2005
// with a fix that should also make it work with future Intel Mac targets.
//
// Using code from various authors found on the RB NUG mailing list

dim result, bias, dayLightbias as Integer
dim info as memoryBlock
dim offset as Integer

#if targetMacOS then

Declare Sub ReadLocation lib "Carbon" (location As ptr)

info = NewMemoryBlock(12)
ReadLocation info
if false then
// bad, because it does not work on Intel Macs:
'offset = info.short(9) * 256 + info.byte(11)
else
offset = BitwiseAnd (info.long(8), &hFFFFFF)
end

offset = info.short(9) * 256 + info.byte(11)
```

```

offset = offset \60
return offset

#endif

#if targetWin32 then

Declare Function GetTimeZoneInformation Lib "Kernel32" ( tzInfoPointer as Ptr ) as Integer
// returns one of
// TIME_ZONE_ID_UNKNOWN 0
// - Note: e.g. New Delhi (GMT+5:30) and Newfoundland (-3:30) return this value 0
// TIME_ZONE_ID_STANDARD 1
// TIME_ZONE_ID_DAYLIGHT 2

info = new MemoryBlock(172)
result = GetTimeZoneInformation(info)

bias = info.Long(0)
// note: the original code I found in the NUG archives used Long(84) and switched to Long(0)
// only for result=1 and result=2, but my tests found that Long(0) is also the right value for result=0

if result = 2 then
daylightBias = info.long(168)
end if
offset = - (bias + dayLightbias)
return offset

#endif

End Function

```

23.0.129 How to get the current window title?

Plugin Version: all, Platform: macOS.

Answer: The code below returns the current window title for the frontmost window on Mac OS X if Accessibility services are

Example:

```

Function CurrentWindowTitle() As string
// your application needs permissions for accessibility to make this work!

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

```

```

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
Return cs.str
end if
end if
end if
end if
End Function

```

23.0.130 How to get the cursor blink interval time?

Plugin Version: all, Platform: macOS.

Answer: On Mac OS you can use GetCaretTime from the toolbox.

Example:

```
declare function GetCaretTime lib "Carbon" () as Integer
```

```
MsgBox str(GetCaretTime()+ " ticks")
```

Notes: 60 ticks make one second.

23.0.131 How to get the list of the current selected files in the Finder?

Plugin Version: all, Platform: macOS.

Answer:

Use the AppleScript like this one:

```
tell application "finder"
return selection
end tell
```

Which translates into this AppleEvent:

```
Process("Finder").SendAE "core,getd,'—':obj { form:prop, want:type(prop), seld:type(sele), from:'null'() }
"
```

and as Xojo code it looks like this:

Example:

```
dim ae as appleEvent
dim o1 as appleEventObjectSpecifier
dim f as folderItem
dim alist as appleEventDescList
dim i as Integer
dim dateiname as string

// setup the AppleEvent
o1=getpropertyObjectDescriptor( nil, "sele")
ae= newappleEvent("core", "getd", "MACS")
ae.objectSpecifierParam("—")=o1

// send it
if ae.send then
// got the list
alist=ae.replyDescList

// now show the list of filename into an editfield:

for i=1 to alist.count
f=alist.folderItem(i)

dateiname=f.name
// editfield1 with property "multiline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
```

end if

23.0.132 How to get the Mac OS system version?

Plugin Version: all, Platform: macOS.

Answer: The following code queries the value and displays the version number:

Example:

```

dim first as Integer
dim second as Integer
dim third as Integer
dim l as Integer

if System.Gestalt("sysv",l) then

Third=Bitwiseand(l,15)
second=Bitwiseand(l\16,15)
first=Bitwiseand(l\256,15)+10*Bitwiseand(l\256\16,15)
end if

if First>=10 then
msgbox "Mac OS X "+str(First)+" "+str(Second)+" "+str(third)
else
msgbox "Mac OS "+str(First)+" "+str(Second)+" "+str(third)
end if

```

23.0.133 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

Dim s As String
Dim b As Boolean
Dim i, resp as Integer

// Systemversion
b = System.Gestalt("sysv", resp)
If b then
s = Hex(resp)

```

```

For i =Len(s)-1 DownTo 1
s=Left(s,i)+””+Mid(s,i+1)
Next
MsgBox ”Systemversion: Mac OS ” + s
end if

```

Notes: The MBS Plugin has a SystemInformationMBS.OSVersionString function for this.

23.0.134 How to get the screensize excluding the task bar?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Use the Screen class with the available* properties.

23.0.135 How to get the size of the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Make yourself a class for the WindowRect with four properties:

```

Bottom as Integer
Left as Integer
Right as Integer
Top as Integer

```

Add the following method to your class:

```

Sub GetWindowRect(windowhandle as Integer)
dim err as Integer
dim mem as memoryBlock
#if targetwin32 then
Declare Function GetWindowRect Lib ”user32.dll” (hwnd as Integer, ipRect As Ptr) as Integer

mem = newmemoryBlock(16)
err = GetWindowRect(windowhandle, mem)
Left = mem.long(0)
Top = mem.Long(4)
Right = mem.Long(8)
Bottom = mem.Long(12)

```

```
#endif  
End Sub
```

Good to use for the MDI Master Window!

23.0.136 How to get the source code of a HTMLViewer?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
// for Windows:
```

```
msgbox HTMLViewer1.IEHTMLTextMBS
```

```
// for MacOS with WebKit 2.x:
```

```
msgbox HTMLViewer1.WKWebViewMBS.HTMLText
```

23.0.137 How to get Xojo apps running Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You need to install some require packages.

Notes: You need CUPS as well as GTK packages. On 64 bit systems also the ia32-libs package.

Please note that you need a x86 compatible Linux. So no PPC, Power, ARM or other CPUs.

23.0.138 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sometimes it may be better to use an extra application to process images.

Notes: A typical 32 bit app made with Xojo can use around 1.8 GB on Windows and 3 GB on Mac OS X. Some images may be huge, so that processing them causes several copies of the image to be in memory. With a 500 MB image in memory, doing a scale or rotation may require a temp image. So with source, temp and dest images with each 500 MB plus your normal app memory usage, you may hit the limit of Windows with 1.8 GB.

In that case it may be worth running a tool like gm in the shell class. gm is the command line version of GraphicsMagick. There you can run the 64 bit version which is not limited in memory like your own application. Also you can monitor progress and keep your app responsive.

23.0.139 How to handle tab key for editable cells in listbox?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this function:

Example:

```
Function HandleTabInList(list as listbox, row as Integer, column as Integer, key as String) As Boolean
// Handle tab character in Listbox.CellKeyDown event
```

```
Select case asc(key)
case 9
if Keyboard.AsyncShiftKey then
// back

// look for column left
for i as Integer = column-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row before
row = row - 1
if row >= 0 then
for i as Integer = list.ColumnCount-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
else
// forward

// look for column right
for i as Integer = column+1 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
```

```

// not found, so look in row below
row = row + 1
if row <list.ListCount then
for i as Integer = 0 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
end if
end Select
End Function

```

Notes: You call it from CellKeyDown event like this:

```

EventHandler Function CellKeyDown(row as Integer, column as Integer, key as String) As Boolean
if HandleTabInList(me, row, column, key) then Return true
End EventHandler

```

As you see in the code, we handle tab and shift + tab for moving back and forward. Also we wrap to previous/next row if needed. Feel free to extend this to wrap from last to first row or create a new row for editing.

23.0.140 How to hard link MapKit framework?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Our MapKit classes weak link the framework. If you need hard linking it for the App Store, you can add this method to a class:

Example:

```

Sub ReferenceMapKit()
// just put this in window or app class

#if TargetMachO and Target64Bit then
Declare sub testing Lib "MapKit" Selector "test" (id as ptr)
testing(nil)
#endif

End Sub

```

Notes: No need to call the method.

Just having it in a window or app, will cause the compiler to hard link the framework.

23.0.141 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.

Example:

```
dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer
CurrentFile.ForceDownload = true

// start the download
showurl(CurrentFile.url)
```

Notes: See our Create PDF example for the Xojo Web Edition.

23.0.142 How to hide all applications except mine?

Platform: macOS.

Answer: The code below will on Mac OS hide all applications except your one:

Example:

```
dim p as new ProcessMBS

p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

23.0.143 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Platform: Windows.

Answer: Set Internet Explorer to silent mode with code like this:

Example:

```
htmlviewer1._ole.Content.value("Silent") = True
```

Notes: Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

23.0.144 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you want to hide something in a chart, simply assign the kTransparent constant as color.

23.0.145 How to hide the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub HideCursor Lib "Carbon" () Inline68K("A852")
```

```
HideCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

23.0.146 How to insert image to NSTextView or TextArea?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to insert file:

Example:

```
// insert a file to textview
```

```
Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
```

```
// read to file
```

```

dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub

```

Notes: For TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

23.0.147 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You can use javascript to change the current window's location.

Example:

```

// load website
htmlviewer1.LoadURL "http://www.monkeybreadsoftware.net/addressbook-abpersonmbs.shtml"

// later jump to anchor named "16":

if TargetWin32 then
call HTMLViewer1.IERunJavaScriptMBS "window.location = ""#16""
end if

```

23.0.148 How to keep a movieplayer unclickable?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: To keep the user away from clicking on a playing Movie you can just drop a Canvas in front of the Movieplayer and take the clicks there.

Example:

```
Function Canvas1.MouseDown(X as Integer, Y as Integer) as boolean
return true // take it and do nothing
End Function
```

23.0.149 How to keep my web app from using 100% CPU time?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Linux and MacOS you can use renice command in the terminal. On Windows use the task manager to reduce priority.

Notes: If you launch your app with nohup on Linux or Mac OS X like this from the terminal or a script:

```
nohup /webapps/MyApp/MyApp &
```

you can simply have a second line saying this:

```
renice 20 $ !
```

which tells the system to lower priority to lowest value for the latest background process.

23.0.150 How to kill a process by name?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can kill a process (or application) by name if you loop over all the processes and kill the one you need.

Example:

```
dim p as new ProcessMBS
p.GetfirstProcess ' get first
do
if p.name = "TextEdit" then
call p.KillProcess
Return
end if
loop until not p.GetNextProcess
```

Notes: You may want to check the result of killProcess function. Not every user is allowed to kill every application.

23.0.151 How to know how many CPUs are present?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```
Function GetCPUCount() as Integer
Declare Function MPProcessors Lib "Carbon" () as Integer
```

```
Return MPProcessors()
End Function
```

Notes: Your app will than need that library to launch on Classic. To avoid this the MBS plugin checks if this library is available and return 1 if it's not available.

23.0.152 How to know the calling function?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use a helper function like this this code:

Example:

```
Public Function CallingFunction() as string
// Query name of calling function of a function
```

```
#Pragma BreakOnExceptions false
```

```
try
```

```
// raise a dummy exception
dim r as new NilObjectException
raise r
```

```
catch x as NilObjectException
```

```
// get stack
dim stack() as string = x.Stack
```

```
// pick function name and return
dim name as string = stack(2)
Return name
```

```
end try
End Function
```

Notes: You need to include function names in your application.

23.0.153 How to launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):

Example:

```
Dim a as AppleEvent
dim creator as string

creator = "MSIE" ' here the Internet Explorer

a = NewAppleEvent("aevt", "odoc", "MACS")
a.Timeout = -1

a.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf", nil, creator)

if not a.send then
msgBox "An error has occured"
else

end if
```

23.0.154 How to launch disc utility?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this code:

Example:

```
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.apple.DiskUtility", "")

if f<>Nil then
f.Launch
end if
```

Notes: This works even if people renamed the disc utility or moved it to another folder.

23.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You may try to embed your changes to the database between two transaction calls.

Example:

```
dim db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

Notes: This can increase speed by some factors.

23.0.156 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Platform: macOS.

Answer: You can use code like this:

Example:

```
Function NewRetinaImage(pic as Picture, mask as Picture = nil) As NSImageMBS
// first make a NSImageMBS from it
dim n as new NSImageMBS(pic, mask)

// now set to half the size, so we have 2x pixels for the image
n.size = new NSSizeMBS(n.width/2, n.height/2)

// and return
Return n
End Function
```

Notes: The thing to do is to have 2x the pixels, but assign a size to the image which gives it the right size in points.

You can pass the NSImageMBS from here to NSMenuItemMBS. For Retina displays, the full resolution is used. For others it will be reduced.

23.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this declares:

Example:

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).
```

```
Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &H8080000
```

```
Dim styleFlags as Integer
```

```
#If TargetWin32 Then
```

```
Declare Function SetWindowLong Lib "user32" Alias "SetWindowLongA" (hwnd as Integer, nIndex as Integer, dwNewLong as Integer) as Integer
```

```
Declare Function SetWindowPos Lib "user32" (hwnd as Integer, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer
```

```
styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )
```

```
#EndIf
```

23.0.158 How to make an alias using AppleEvents?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
```

```
dim ev as AppleEvent
```

```
dim myResult as boolean
```

```
dim properties as AppleEventRecord
```

```
ev = NewAppleEvent("core", "crel", "MACS")
```

```
ev.MacTypeParam("kocl") = "alis"
```

```
ev.FolderItemParam("to ") = target
```

```
ev.FolderItemParam("insh") = folder
```

```
properties=new AppleEventRecord
```

```

properties.StringParam("pnam")=aliasname

ev.RecordParam("prdt")=properties

myResult = ev.send
// true on success, false on error
End Sub

```

Notes: Call it like this:

```
MakeAlias SpecialFolder.Desktop, SpecialFolder.Desktop.Child("Gif Copy.rb"), "test.rb alias"
```

Seems to not work on Mac OS X 10.6

23.0.159 How to make AppleScripts much faster?

Plugin Version: all, Platform: macOS.

Answer: use "ignoring application responses" like in this example:

```

Notes: on run { fn,fpx,fpy }
ignoring application responses
tell app "Finder" to set the position of folder fn to fpx,fpy
end ignoring
end run

```

23.0.160 How to make double clicks on a canvas?

Plugin Version: all, Platform: macOS.

Answer:

Update: Newer Xojo versions support DoubleClick event, so you don't need this code.

Here's my tip from the tips list on how to add a double-click event to the Canvas control. The technique could easily be used for a window or any Rectcontrol:

Because of its built-in drawing methods, the Canvas control is often used to create custom interface controls. But while the Canvas control has event handlers for most mouse events, it doesn't have an event handler for DoubleClick events. Fortunately, you can add a double-click event handler to a Canvas control easily. Basically, you're going to create a new class based on Canvas and add a double-click event to that. You can then use the new class anytime you need a Canvas with a double-click event.

To create a new Canvas class with a DoubleClick event handler, do this:

1. Add a new class to your project.
2. Set the Super property of the new class to "Canvas".
3. Change the name of this new class to "DoubleClickCanvas".

A double-click occurs when two clicks occur within the users double-click time (set in the Mouse control panel on both Macintosh and Windows) and within five pixels of each other. So, you'll need a few properties to store when and where the last click occurred.

4. Add a new property with the following declaration and mark it as private: lastClickTicks as Integer
5. Add a new property with the following declaration and mark it as private: lastClickX as Integer
6. Add a new property with the following declaration and mark it as private: lastClickY as Integer

Since the Canvas control doesn't have a DoubleClick event, you will need to add one.

7. Add a new event to your class by choosing New Event from the Edit menu and enter "DoubleClick" as the event name.

Double-clicks occur on MouseUp. In order for the mouseUp event to fire, you must return True in the MouseDown event.

8. In the MouseDown event, add the following code:
Return True

In the MouseUp event, you will need to determine what the users double-click time is. This value is represented on both the Mac and Windows in ticks. A tick is 1/60th of a second. Since there isn't a built-in function for this, you'll need to make a toolbox call. The mouseUp event code below makes the appropriate toolbox call for both Macintosh and Windows. It then compares the time of the users last click to the time of the current click and compares the location of the users last click to the location of the current click.

9. Add the following code to the MouseUp event:

```
dim doubleClickTime, currentClickTicks as Integer

#if targetMacOS then
Declare Function GetDbfTime Lib "Carbon" () as Integer
doubleClickTime = GetDbfTime()
#endif

#if targetWin32 then
Declare Function GetDoubleClickTime Lib "User32.DLL" () as Integer
```

```

doubleClickTime = GetDoubleClickTime()/60 // convert to ticks from milliseconds
#endif

currentClickTicks = ticks
//if the two clicks happened close enough together in time
if (currentClickTicks - lastClickTicks) <= doubleClickTime then
//if the two clicks occurred close enough together in space
if abs(X - lastClickX) <= 5 and abs(Y - LastClickY) <= 5 then
DoubleClick //a double click has occurred so call the event
end if
end if
lastClickTicks = currentClickTicks
lastClickX = X
lastClickY = Y

```

10. Now to test out your new DoubleClickCanvas, drag the class from the Project window to a window in your project to create an instance of it.

11. Double-click on the canvas you just added to your window to open the Code Editor. Notice that the canvas has a DoubleClick event handler. In this event handler, add the following code:
BEEP

23.0.161 How to make my Mac not sleeping?

Plugin Version: all, Platform: macOS.

Answer: Just inform the Mac OS about some system activity with code like this:

Example:

```
Sub UpdateSystemActivity()
```

```
#if TargetCarbon
```

```
declare function myUpdateSystemActivity lib "Carbon" alias "UpdateSystemActivity" (activity as Integer)
as short
```

```
const OverallAct = 0 // Delays idle sleep by small amount */
const UsrActivity = 1 // Delays idle sleep and dimming by timeout time */
const NetActivity = 2 // Delays idle sleep and power cycling by small amount */
const HDAActivity = 3 // Delays hard drive spindown and idle sleep by small amount */
const IdleActivity = 4 // Delays idle sleep by timeout time */
```

```
dim e as Integer
```

```
e=myUpdateSystemActivity(UsrActivity)
```

```
// you may react on an error if e is not 0 after the call.
```

```
#endif
End Sub
```

Notes: You may use another constant if you prefer some different behavior. Call it maybe every second.

23.0.162 How to make my own registration code scheme?

Plugin Version: all, Platform: Windows.

Answer: There are excellent articles about how to make a registration code scheme, but you can also simply use our RegistrationEngineMBS class.

Notes: If you need a license text, why not use the one from Xojo as a starting point?

23.0.163 How to make small controls on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```

'/*
** Use the control's default drawing variant. This does not apply to
** Scroll Bars, for which Normal is Large.
**/
const kControlSizeNormal = 0

'/*
** Use the control's small drawing variant. Currently supported by
** the Check Box, Combo Box, Radio Button, Scroll Bar, Slider and Tab
** controls.
**/
const kControlSizeSmall = 1

'/*
** Use the control's small drawing variant. Currently supported by
** the Indeterminate Progress Bar, Progress Bar and Round Button
** controls.
**/
const kControlSizeLarge = 2

```

```

'/*
' * Control drawing variant determined by the control's bounds. This
' * ControlSize is only available with Scroll Bars to support their
' * legacy behavior of drawing differently within different bounds.
' */
const kControlSizeAuto = &hFFFF

const kControlSizeTag = "size"

declare function SetControlData lib "Carbon" (controlhandle as Integer, part as short, tagname as OS-
Type, size as Integer, data as ptr) as short

dim m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))

```

23.0.164 How to mark my Mac app as background only?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSUIElement"" YES")

```

Notes: This will set the NSUIElement flag to YES.

23.0.165 How to move a file or folder to trash?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```

Function MoveToTrash(f as FolderItem) As Boolean
#if TargetMacOS then
dim r as FolderItem
dim e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFile-
OperationDefaultOptions)

```

```

if e = 0 then
Return true // Ok
end if

#elseif TargetWin32 then
dim w as new WindowsFileCopyMBS

dim flags as Integer = w.FileOperationAllowUndo + w.FileOperationNoErrorUI + w.FileOperationSilent
+ w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if

flags = w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if
#else
// Target not supported
break
Return false
#endif
End Function

```

Notes: If you want to move a file to trash, you could use `f.movefileto f.trashfolder`, but that will overwrite existing files in the trash. You can use our `MacFileOperationMBS` class to move a file on Mac to the trash. And it uses the same code as the Finder, so files are renamed when the same name is already in use in the trash:

On Windows we use `WindowsFileCopyMBS` class.
Requires Mac OS X 10.5.

23.0.166 How to move an application to the front using the creator code?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:

Example:

```

dim a as appleevent

a=newappleEvent("misc","actv","ttxt")

```

```
if a.send then
end if
```

Notes: (Code is Mac only)

23.0.167 How to move file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
dim d as CURLMBS // your curl object

// rename/move file
dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNT0 MyFile.txt"

d.SetOptionPostQuote(ws)
```

Notes: Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. So rename is two commands. First RNFR to tell where to rename from and second RNT0 with the new file name. To delete use DELE and the file path.

23.0.168 How to normalize string on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```
Function Normalize(t as string) As string
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS = NewCFStringMBS(t)
dim m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)
```

```
Return m.str  
End Function
```

Notes: This uses Apple's CFString functions to normalize unicode variants.

23.0.169 How to obscure the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ObscureCursor Lib "Carbon" ()
```

```
ObscureCursor
```

Notes: The MBS Plugin has this function, but it's not supported for Windows.

23.0.170 How to open icon file on Mac?

Plugin Version: all, Platform: macOS.

Answer: Use the NSImageMBS class like this:

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ico")
```

```
dim n as new NSImageMBS(f)
```

```
window1.Backdrop = n.CopyPictureWithMask
```

23.0.171 How to open PDF in acrobat reader?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
dim pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
```

```

// open PDF in Acrobat Reader on Mac:

// find app
dim bundleID as string = "com.adobe.Reader"
dim app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")

if app<>nil then

// launch app with parameters

dim docs() as FolderItem
docs.Append pdf

dim param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

dim x as FolderItem = LaunchServicesOpenXMBS(docs, param)

// on failure, simply launch it
if x = nil then
pdf.Launch(true)
end if

else
pdf.Launch(true)
end if

```

Notes: On Windows, simply use pdf.launch or WindowsShellExecuteMBS.

23.0.172 How to open printer preferences on Mac?

Plugin Version: all, Platform: macOS.

Answer: You can use our OpenMacOSXPreferencesPaneMBS function like this:

Example:

```

dim e as Integer = OpenMacOSXPreferencesPaneMBS("PrintAndFax")
if 0 = e then
MsgBox "OK"
elseif e = -43 then
MsgBox "File not found."
else
MsgBox "Error: "+str(e)
end if

```

23.0.173 How to open special characters panel on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have functions for that in Cocoa and Carbon.

Example:

```
dim a as new NSApplicationMBS
a.orderFrontCharacterPalette
```

Notes: For Cocoa, you can use `orderFrontCharacterPalette` method in `NSApplicationMBS` class.

Or simply for Carbon and Cocoa the `ShowCharacterPaletteMBS` method.

23.0.174 How to optimize picture loading in Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the `WebPicture` class.

Notes: Take your picture and create a `WebPicture` object. Store this `WebPicture` in a property of the `WebPage`, `Session` or `app` (as global as possible). On the first time you use this picture on an user session, the browser will load it. Second time you use it, the browser will most likely pick it from the cache.

Having pictures in `App` or some module reuses the same picture for all sessions which reduces memory footprint.

This does not work well with pictures you change very often or use only for one webpage on one user.

If you like to see an example, check our `Map` example.

23.0.175 How to parse XML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
dim s as string = "<test><test /></test>"
```

```
try
```

```

dim x as new XmlDocument(s)
MsgBox "OK"
catch xe as XmlException
MsgBox "invalid XML"
end try

```

Notes: If you got an exception, you have a parse error.

23.0.176 How to play audio in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the HTML5 audio tag and control it with javascript.

Notes: This is just another example app I made today. It plays a christmas song. The audio file is provided by the application to the server, so no external web server is needed and this application can run stand alone. To compile and run you need Xojo 2010r5.

In the open event we search the audio files and open them as binarystreams. We create the two webfile objects. Those webfiles are part of the app class, so we have them globally. There we set the data with the content of our streams. We also define file names and mime types. They are needed so browser know what we have here:

```

audioFileM4V = new WebFile
audioFileM4V.Data = bM.Read(BM.Length)
audioFileM4V.Filename = "music.m4a"
audioFileM4V.MIMEType = "audio/m4a"

```

```

audioFileOGG = new WebFile
audioFileOGG.Data = bO.Read(BO.Length)
audioFileOGG.Filename = "music.ogg"
audioFileOGG.MIMEType = "audio/ogg"

```

Next in the open event of the webpage we have a PageSource control. The location is set to be before content. In the open event we define the html code for this. First we pick the URLs for the audio files. Than we build the html to use the audio tag. As you see, we give it an ID for later use and have it preload automatically. If you add an autoplay tag, you can have the audio play right away. Inside the audio tag we have two sources so we provide audio for both Firefox (OGG) and Safari (MPEG4). Finally we have a text to display if HTML5 audio tag is not supported.

You can set the source in the EditSource event:

```
dim urlO as string = app.audioFileOGG.URL
dim urlM as string = app.audioFileM4V.URL
me.Source = "<audio id=""mymusic"" preload=""auto""><source src="""+urlO+""" type=""audio/ogg""
/><source src="""+urlM+""" type=""audio/mpeg"" />Your browser does not support the audio ele-
ment.</audio>"
```

Next in the Play button we execute code to play the audio. This is a short javascript code which searches in the html document for the element with the ID "mymusic" which is the ID of our audio tag above. Once we got the object, we call it's play method to start playback.

```
me.ExecuteJavaScript("document.getElementById('mymusic').play();")
```

same for pause:

```
me.ExecuteJavaScript("document.getElementById('mymusic').pause();")
```

and finally for changing volume:

```
me.ExecuteJavaScript("document.getElementById('mymusic').volume="+str(me.Value/100.0)+"");")
```

23.0.177 How to pretty print xml?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the XML Transform method with the right XLS.

Notes: Learn more here:

<http://docs.xojo.com/index.php/XMLDocument.Transform>

23.0.178 How to print to PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code below shows how to redirect printing to a PDF file on Mac OS X.

Example:

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString
```

```

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20

```

Notes: And you can use normal graphics class for that.

23.0.179 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Platform: macOS.

Answer: You can use a MDItemMBS objec to query this value:

Example:

```

Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
#If TargetMacOS Then
Dim xMDItem as New MDItemMBS(F)
Dim xDate as Variant

If xMDItem <>Nil Then
xDate = xMDItem.GetAttribute(xMDItem.kMDItemLastUsedDate).DateValue
If xDate IsA Date Then Return xDate
Else
If xDate <>Nil Then Break
End If
#EndIf

If DefaultOtherDates Then
If F.ModificationDate <>Nil Then Return F.ModificationDate
If F.CreationDate <>Nil Then Return F.CreationDate
End If
End Function

```

Notes: Thanks for Josh Hoggan for this example code.

23.0.180 How to quit windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
dim i1,i2,r as Integer
declare function ExitWindowsEx lib "user32" (uFlags as Integer, dwReserved as Integer) as Integer
i1 = 2
i2 = 0
r = ExitWindowsEx(i1,i2)
if r<>0 then
' Error()
end if

#endif
```

Notes: uFlags parameters:

```
'4 = EWX_Force
'0 = EWX_Logoff
'2 = EWX_Reboot
'1 = EWX_shutdown, should shut down computer
```

Also check the ExitWindowsMBS method.

23.0.181 How to read a CSV file correctly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = f.OpenAsTextFile

while not t.EOF
dim s as string = t.ReadLine(encodings.ASCII)

dim items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")
```

```
List.AddRow """
dim u as Integer = UBound(items)
for i as Integer = 0 to u
List.Cell(List.LastIndex,i) = items(i)
next

wend
```

Notes: Please make sure you choose the right text encoding.

23.0.182 How to read the command line on windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

#endif
```

Notes: Newer Xojo versions have a system.commandline property.

23.0.183 How to render PDF pages with PDF Kit?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
// choose a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
dim sourceFile as New PDFDocumentMBS(f)
```

```

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
dim c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
dim page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
dim p as NSImageMBS = page.Render

// and convert to RB picture and display
Backdrop = p.CopyPictureWithMask

next

end if

```

Notes: PDFKit works only on Mac OS X.

23.0.184 How to restart a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```

dim ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if

```

23.0.185 How to resume ftp upload with curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: CURL supports that and you simply need to set the right options.

Notes: First of course OptionUpload must be true. Second OptionFTPAppend must be true so the OptionResumeFrom is used. Store there (or in OptionResumeFromLarge) your start value. Don't forget to implement the read event and return data there as requested.

23.0.186 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code opens a PDF and draws the first page into a new PDF with 90–∞ rotation.

Example:

```
// Rotate a PDF page

// our files
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90–∞
c.RotateCTM pi*1.5

// fix origin
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage
```

```
c = nil

// show in PDF viewer
destfile.Launch
```

Notes: This code is Mac only as it needs CoreGraphics.

23.0.187 How to rotate image with CoreImage?

Plugin Version: all, Platform: macOS.

Answer: Use the code like the one below:

Example:

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation

// as Xojo picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

23.0.188 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Install 32 bit compatibility libraries.

Notes: The package is called ia32-libs for ubuntu (and others).

Some applications need to be run on a 32 bit system as they need some hardware related libraries. Like libUSB or libHID for USB devices.

23.0.189 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Platform: macOS.

Answer: You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.

Example:

```
// make it landscape
dim n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
n.orientation = n.NSLandscapeOrientation

// save html to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call HTMLViewer1.PrintToPDFFileMBS(f,10,30,10,30)
```

Notes: You may want to reset options later.
This code is only for Mac OS X.

23.0.190 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to save to RTFD:

Example:

```
// save text as RTFD including image attachments
dim f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtfd, "test.rtf")

if f = nil then Return

dim a as NSAttributedStringMBS = textView.textStorage
dim w as NSFFileWrapperMBS = a.RTFDFileWrapperFromRange(0, a.length, DocumentAttributes)

dim e as NSErrorMBS
if w.writeToFile(f, e) then
```

```

else
MsgBox e.LocalizedDescription
end if

```

Notes: For TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

23.0.191 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to load PDF to htmlviewer on desktop?

Example:

```

Public Sub LoadPDFData(viewer as HTMLViewer, PDFData as string)
Dim base64string As String = EncodeBase64(PDFData)

// remove line endings to make it a big line
base64string = ReplaceLineEndings(base64string, "")

// build data URL
// https://en.wikipedia.org/wiki/Data_URI_scheme
Dim dataURL As String = "data:application/pdf;base64," + base64string

// show in webviewer
HTMLViewer1.LoadURL(dataURL)

// may not work everywhere due to URL length limit
// for Web projects, use WebFile instead!
End Sub

```

Notes: This avoids a temporary file, which may also work.
For Web Apps, please use WebFile.

23.0.192 How to scale a picture proportionally with mask?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportionalScaledWithMask(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
dim m as picture = pic.mask(False)
pic.mask = nil

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

if m <>nil then
// restore mask and scale it
pic.mask = m
NewPic.mask.Graphics.DrawPicture m, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height
end if

// return result
Return NewPic
End Function

```

Notes: This version handles mask. As you see we actually have to remove mask in order to copy the picture part correctly.

23.0.193 How to scale a picture proportionally?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportionalScaled(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

```

```

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

// return result
Return NewPic
End Function

```

Notes: This does not handle mask, but you can scale the mask the same way and assign it to the new picture.
(see other FAQ entry with mask)

23.0.194 How to scale/resize a CIIImageMBS?

Plugin Version: all, Platform: Windows.

Answer: Use the CIFilterLanczosScaleTransform filter to scale down a picture to a specific size.

Example:

```

Dim pic As Picture = LogoMBS(500)
Dim image As CIIImageMBS = CIIImageMBS.imageWithPicture(pic)

Dim filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Dim scale As Double = targetHeight / image.Extent.Height
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim result As Picture = filter.outputImage.RenderPicture

Backdrop = result

```

Notes: This is same code as our scaleTo convenience method.

23.0.195 How to scale/resize a picture?

Plugin Version: all, Platform: Windows.

Answer: There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.

Example:

```
dim Original,Scaled as Picture
```

```
Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)
```

Notes: The plugin ways:

- GraphicsMagick can scale/resize.
- CoreImage scale filter may result in the fastest and best images on Mac OS X 10.4.
- NSImageMBS can scale, but is Mac OS X only.
- CGImageMBS can scale, but is Mac OS X only.
- CIImageMBS can scale, but is Mac OS X only.
- QuickTime Graphics exporter and importer can be connected to scale. (this was used more often a few years ago)
- ImageMagick can scale very nice and crossplatform. But the ImageMagick libraries are big.
- The picture.ScaleMBS function is self written and results in equal output on Mac, Windows and Linux without any additional libraries installed.
- Picture.ScalingMBS does crossplatform scaling with several modes.

with pure Xojo:

- make a new picture and draw the old one with new size inside.

23.0.196 How to search with regex and use unicode codepoints?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can specify unicode characters in search string with backslash x and digits.

Example:

```
dim r as RegExMbs
dim s as string
dim c as Integer
```

```

s="123 √√√° ABC 456"

r=new RegExMBS
if r.Compile("√.") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

r=new RegExMBS
if r.Compile("\xF6.") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

```

23.0.197 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```

Function Invisible(F As FolderItem) As Boolean
Dim TIS As TextInputStream
Dim S,All As String
Dim I as Integer
dim g as folderitem

If Left(F.Name,1)="." or not f.visible Then
Return True
End If

g=F.Parent.Child(".hidden")
If g.Exists Then
TIS=g.OpenAsTextFile
if tis<>Nil then
All=TIS.ReadAll
For I=1 to CountFields(All,Chr(11))
S=NthField(All, Chr(11), I)

```

```

If S=F.name Then
Return True
End If
Next
end if
End if
End Function

```

23.0.198 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You use the pragma cache_size command on the database.

Example:

```

// set cache size to 20000 pages which is about 20 MB for default page size
dim db as REALSQLDatabase
db.SQLExecute "PRAGMA cache_size = 20000"

```

Notes: Default cache size is 2000 pages which is not much.

You get best performance if whole database fits in memory.

At least you should try to have a cache big enough so you can do queries in memory.

You only need to call this pragma command once after you opened the database.

23.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

Answer: Try this declares:

Example:

```

window1.ModifiedMBS=true

```

23.0.200 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the

Example:

```

dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer

// load into html viewer
HTMLViewer1.URL = CurrentFile.URL

```

Notes: See our Create PDF example for the Xojo Web Edition.

23.0.201 How to show Keyboard Viewer programmatically?

Platform: macOS.

Answer: Use Xojo or AppleScript to launch the KeyboardViewerServer.app.

Example:

```

dim a as new AppleScriptMBS
dim text as string
dim lines(-1) as string

lines.append "set theApplication to ""KeyboardViewerServer""
lines.append "set thePath to ""/System/Library/Components/KeyboardViewer.component/Contents/Shared-
Support/KeyboardViewerServer.app""
lines.append ""
lines.append "set POSIXPath to ((POSIX file thePath) as string)"
lines.append "tell application ""System Events"" to set isRunning to 0 <(count (application processes whose
name is theApplication))"
lines.append "if isRunning then tell application POSIXPath to quit"
lines.append "delay 0.15"
lines.append ""
lines.append "ignoring application responses"
lines.append " tell application POSIXPath to run"
lines.append "end ignoring"

text=join(lines,EndOfLine.macintosh)

a.Compile text
a.Execute

```

Notes: AppleScript code:

```
set theApplication to "KeyboardViewerServer"
set thePath to "/System/Library/Components/KeyboardViewer.component/Contents/SharedSupport/KeyboardViewerServer.app"
```

```
set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theApplication))
if isRunning then tell application POSIXPath to quit
delay 0.15
```

```
ignoring application responses
tell application POSIXPath to run
end ignoring
```

23.0.202 How to show the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ShowCursor Lib "Carbon" ()
```

```
ShowCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

23.0.203 How to shutdown a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","shut","MACS")
if not ae.send then
msgBox "The computer couldn't be shutdown."
end if
```

Notes: Or toolbox call (Attention: This method will stop the computer immediatly: No document asked to be saved, all applications quitting without knowing).

```
Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower
```

23.0.204 How to sleep a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

23.0.205 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Here a few speed tips:

Notes:

- Use the DynaPDFRasterizerMBS function instead of our render functions.
- Reuse DynaPDFRasterizerMBS as long as the target picture size doesn't change.
- Import only the PDF pages you want to display.
- Let DynaPDF do zooming, rotating or other effects instead of you change it.

23.0.206 How to use PDFLib in my RB application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The PDFlib plugin was discontinued in favor of our DynaPDF plugin.

Notes: If you need help to move, please contact us.

23.0.207 How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Just double them.

Example:

```
msgbox "This String contains ""quotes"""
```

23.0.208 How to use Sybase in Web App?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use our MBS Xojo SQL Plugin to connect to a Sybase Database in your web application.

Notes: If you see db.Connect giving the error message "cs_ctx_alloc ->CS_MEM_ERROR", than some things are not setup right for Sybase.

The Apache process may not have all the SYBASE environment variables being set when the CGI was launched.

Adding these lines to /etc/httpd/conf/httpd.conf stopped the faux memory errors for us:

```
SetEnv LD_LIBRARY_PATH /opt/sybase/OCS-15_0/lib:/opt/sybase/OCS-15_0/lib3p64:/opt/sybase/OCS-15_0/lib3p:
SetEnv SYBROOT /opt/sybase
SetEnv SYBASE_OCS /opt/sybase
SetEnv SYBASE /opt/sybase
```

23.0.209 How to use the Application Support folder?

Plugin Version: all, Platform: macOS.

Answer:

I was saving a registration code for an app to the Preference folder. People on the list have suggested that it would be better in the ApplicationSupportFolder. How do I save the file called CWWPrefs into that folder using MBS?

I have checked for examples and the docs but can't see how to apply it

```
//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)
```

Example:

```

dim folder,file as FolderItem

folder = createApplicationSupportFolderMBS(-32763)

if folder=nil then
// Some very old Mac OS Versions may not support it
// or the plugin may fail for any reason
folder=SpecialFolder.Preferences
end if

file=folder.Child("CWWPrefs")

MsgBox file.NativePath

```

Notes:

You may not be able to write there with a normal user account!

23.0.210 How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Platform: macOS.

Answer: You can use the following code which does this using the SoftDeclareMBS class.

Example:

```

Sub Open()
dim c as CFDateMBS
dim t as CFAbsoluteTimeMBS

// get current date
c=NewCFDateMBS

// in absolute time (seconds since x)
t=c.AbsoluteTime

// add 600 seconds (= 10 Minutes)
t.Value=t.Value+600

// Make a Date from it
c=t.Date

// Schedule the event
// 0 on success
// E00002C1 for missing root rights

```

```

Title=hex(schedulePowerEvent(c, "wake"))

// Just for information, display the scheduled stuff
CFShowMBS CopyScheduledPowerEvents
End Sub

Function CopyScheduledPowerEvents() As carrayMBS
dim s as SoftDeclareMBS
dim m as MemoryBlock

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMCopyScheduledPowerEvents") then
if s.CallFunction(0,nil) then
Return NewCFArrayMBSHandle(s.Result,true)
else
MsgBox "Failed to Call IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOKit."
end if

Return nil
End Function

Function SchedulePowerEvent(time_to_wake as CFDateMBS, Type as CFStringMBS) as Integer
dim s as SoftDeclareMBS
dim m as MemoryBlock

'/*
'* Types of power event
'* These are potential arguments to IOPMSchedulePowerEvent().
'* These are all potential values of the kIOPMPowerEventTypeKey in the CFDictionaryes
'* returned by IOPMCopyScheduledPowerEvents().
'*/
'/*!
'@define kIOPMAutoWake
'@abstract Value for scheduled wake from sleep.
'*/
'#define kIOPMAutoWake "wake"
,
'/*!
'@define kIOPMAutoPowerOn
'@abstract Value for scheduled power on from off state.

```

```

*/
`#define kIOPMAutoPowerOn "poweron"
,
`/*!
`@define kIOPMAutoWakeOrPowerOn
`@abstract Value for scheduled wake from sleep, or power on. The system will either wake OR
`power on, whichever is necessary.
*/
,
`#define kIOPMAutoWakeOrPowerOn "wakepoweron"
`/*!
`@define kIOPMAutoSleep
`@abstract Value for scheduled sleep.
*/
,
`#define kIOPMAutoSleep "sleep"
`/*!
`@define kIOPMAutoShutdown
`@abstract Value for scheduled shutdown.
*/
,
`#define kIOPMAutoShutdown "shutdown"

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMSchedulePowerEvent") then

m=NewMemoryBlock(12)
m.Long(0)=time_to_wake.handle
m.Long(4)=0 // nil
m.Long(8)=type.Handle

if s.CallFunction(3,m) then
Return s.Result
end if
end if
end if

End Function

```

Notes: Requires Mac OS X and to execute root rights.

23.0.211 How to validate a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this function below which uses a regular expression to verify that the string is a valid UUID/GUID:

Example:

Function IsGUID(guid as string) As Boolean

dim r as new RegEx

```
r.SearchPattern = "^(\{ 0,1 \} ([ 0-9a-fA-F ] ) { 8 } -([ 0-9a-fA-F ] ) { 4 } -([ 0-9a-fA-F ] ) { 4 } -([ 0-9a-fA-F ] ) { 4 } -([ 0-9a-fA-F ] ) { 12 } \} { 0,1 } )$ "
```

Return r.Search(guid)<>nil

End Function

Notes: Simply parsing the GUID with CFUUIDMBS does not give the same result as CFUUIDMBS will also take a string like "DDDD".

23.0.212 How to walk a folder hierarchie non recursively?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this one:

Example:

Sub Walk(folder as FolderItem)

dim folders() as FolderItem

folders.Append folder

while UBound(folders)>=0

dim currentFolder as FolderItem = folders.pop

dim c as Integer = currentFolder.Count

for i as Integer = 1 to c

dim item as FolderItem = currentFolder.TrueItem(i)

if item = Nil then

// no permission

elseif item.Visible then // only visible

if item.Directory then

folders.Append item

```
else
// work with file here
end if

end if

next

wend
End Sub
```

Notes: As you see we go with a long loop which runs until we don't have more folders to process. We ignore items we can't access due to permission limits. And we only work visible items. If you like, check `folderitem.isBundleMBS` on item to handle packages and applications better on Mac OS X.

23.0.213 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Platform: macOS.

Answer: The plugins MacOSX and MacOSXCF belong together. If you use one part, please also install the other part.

Notes: We splitted the plugin because the Xojo IDE on Windows crashed on compilation.

23.0.214 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There are two main reasons.

Notes: 1. you may use the plugin before registering them. This is often the case if you register in a window open event and use the plugin in a control open event.

On the console on Mac OS X or Windows, you may see a message like this "MBS Plugins were used by the application before the RegisterMBSPlugin function was called. Please fix this in your code!".

2. you may have mixed different plugin versions which are not compatible.

In this case you can see a message "Internal plugin registration error." on the console on Mac OS X. Newer plugins may show a message dialog reporting this. Older version simply think they are not registered.

If the installer just merges old and new applications, users may have libraries of older and newer plugin versions in the libs folder. If your application loads the wrong version, the registration fails.

If you use remote debugging, make sure you clear the temporary files there, too. Otherwise you may have old DLLs on your hard disc which may disturb your application.

You can run into issues if you use your registration code on different places of your app. Please register only once in app.open (or app Constructor). If you have several codes, simply call them one after the other.

Also check that you only call RegisterMBSPlugin with valid serial number. If you later call RegisterMBSPlugin with Demo like in example code above, you remove the license.

Next check if you can clear the Xojo caches and that helps. This includes the Xojo Scratch folder and the Plugins & Project caches. Simply locate those folders and delete them. For Windows look in hidden AppData folder in your user folder. For Mac, please check textasciitilde /Library/Caches and your temp folders.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

23.0.215 I want to accept Drag & Drop from iTunes

Plugin Version: all, Platform: macOS.

Answer: You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.

Example:

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub
```

```
Sub DropObject(obj As DragItem)
dim s as string
dim f as folderItem
dim d as CFDictionaryMBS
dim o as CFObjectMBS
dim key as CFStringMBS
dim dl as CFDictionaryListMBS
dim i,c as Integer
dim u as CFURLMBS
dim file as FolderItem
```

```
if obj.MacDataAvailable("itun") then
s = obj.MacData("itun")
```

```
// Parse XML
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

// Make dictionary
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

// get Tracks Dictionary
key=NewCFStringMBS("Tracks")
o=d.Value(key)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
dl=d.List

// Walk over all entries in the Tracks dictionary
c=dl.Count-1
for i=0 to c
o=dl.Value(i)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

key=NewCFStringMBS("Location")
o=d.Value(key)
if o isa CFStringMBS then
u=NewCFURLMBS CFStringMBS(o),nil

file=u.file
if file<>nil then
MsgBox file.NativePath
end if
end if
end if
next
end if
end if
end if
End Sub
```

Notes: The code above inside a window on Xojo 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

23.0.216 I'm drawing into a listbox but don't see something.

Plugin Version: all.

Answer: If you draw this in a listbox cellbackground, you need to draw on the correct position

Example:

```
Function CellBackgroundPaint(g As Graphics, row as Integer, column as Integer) As Boolean
dim f as FolderItem
f=SpecialFolder.Desktop
f.DrawWideIconMBS(g,listbox1.left,listbox1.top+row*20,16)
Return true
End Function
```

Notes: Try this in a listbox. The Graphics object there has a clipping and an offset which the plugin doesn't know about.

23.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Platform: macOS.

Answer:

The code I produced in RB isn't smooth enough. Is there a call in MBS, if not, can it be done? The speed of it has to be like the show of a DrawerWindow.

Try the declare below for Carbon. With WindowLib it will work on Mac OS 8.5 and newer.

Notes:

See Window.Transition functions.

23.0.218 If I use one of your plug-ins under windows, would this then impose the use of dll after compilation or my would my compiled soft still be a stand-alone single file software?

Platforms: macOS, Linux, Windows.

Answer: Stand alone.

Notes: Xojo compiles all used plugins into the application binary.

Some plugin parts need external dlls but you will find that in the documentation. (e.g. pdflib for some classes)

23.0.219 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Platform: macOS.

Answer: I am unable to figure out how or if it is possible to detect if the fn key is down on a powerbook keyboard. Is it possible?

Example:

' Window.Open Event of a blank project:

```
dim i as Integer

for i=0 to 127
if keyboard.asynckeydown(i) then
title=str(i) // found
return
end if
next
title="" // not found
```

Notes: This test application shows the keycode (decimal) 63 for the fn key.

23.0.220 Is there a case sensitive Dictionary?

Plugin Version: all.

Answer: The MBS Plugin has several classes which can work as a replacement.

Notes: First you could use VariantToVariantHashMapMBS or VariantToVariantOrderedMapMBS.

If you know that all keys are Strings or Integers only, you can use the specialized classes which are a little bit faster due to avoiding variants:

```
IntegerToIntegerHashMapMBS class
IntegerToIntegerOrderedMapMBS class
IntegerToStringHashMapMBS class
IntegerToStringOrderedMapMBS class
IntegerToVariantHashMapMBS class
IntegerToVariantOrderedMapMBS class
StringToStringHashMapMBS class
StringToStringOrderedMapMBS class
StringToVariantHashMapMBS class
StringToVariantOrderedMapMBS class
```

23.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the DirectorySizeMBS class for this as in the example below:

Example:

```
dim d as DirectorySizeMBS

d=new DirectorySizeMBS

// volume(1) as my boot volume is very full
if d.update(volume(1),true,0) then
MsgBox str(d.VisibleItemCount)+" visible items, "+str(d.HiddenItemCount)+" invisible items."
end if
```

Notes: Complete Question: Is there a way to use the MBS plugin to get only the visible item and folder count on a volume? The FileCount and FolderCount properties of VolumeInformationMBS seem to provide the total # of items including invisible items such as .DS_Store and more importantly .Trashes which is causing me a great amount of difficulty during a recursive scan of a volume. I've got a progress bar which uses the total of the filecount and foldercount properties as the maximum value, but my routine needs to filter out all invisible items, as it is creating a catalog of a volume for archiving purposes. Any thoughts how I could get accurate number.

23.0.222 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Platform: macOS.

Answer: Use the code below:

Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

23.0.223 List of Windows Error codes?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have a list of windows error codes on our website.

Notes: <http://www.monkeybreadsoftware.de/xojo/winerror.shtml>

23.0.224 Midi latency on Windows problem?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The issue is system related, not a problem with RB or the plugin.

Notes: Two things will adversely affect the timing:

(1) latency of the software synthesizer output driver. The default Windows wavetable synthesizer has considerable latency. I don't know how many milliseconds, but it is noticeable.

(2) latency of the digital audio output driver. Different systems have different drivers for different audio hardware. My Dell laptop has a minimum 15ms latency in the audio driver.

These two things put together were causing a very sluggish MIDI response. I was able to verify these as the culprits by routing MIDI directly out of RB into a sample player, which only introduces the latency of (2) and does not include latency of (1).

I don't know how widely known are these facts, if not then you may want to add this information to the documentation, since Windows programmers using the MIDI plugin may not know those problems, and might mistakenly blame your plugin, as I did :) Sorry about that!

(From Aaron Andrew Hunt)

23.0.225 My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

Answer: Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:

Notes: Just a list of checks to do for linux apache installations:

- You have 64bit linux? Then you need 32 bit compatibility libraries.
- The folder of your app is writable? Set permissions to 777.
- The cgi script is executable? Set permissions to 755.

- The app file itself is executable? Set permissions to 755.
- You uploaded cgi file as text, so it has unix line endings? (this often gives error "Premature end of script headers" in apache log)
- You uploaded config.cfg file and made it writable? Set permissions to 666.
- Your apache allows execution of cgi scripts? You enabled cgi for apache and uncommented addhandler command for CGI on a new apache installation?
- You uploaded the app file and libraries as binary files? Upload as text breaks them.
- You did upload the libs folder?
- You don't have code in app.open, session.open and other events which crashes app right at launch?
- You don't have a print command in your app.open event? (see feedback case 23817)
- You allowed htaccess file to overwrite permissions?

23.0.226 SQLiteDatabase not initialized error?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Before you can use SQLiteDatabaseMBS, it must be initialized.

Example:

```
dim d as new SQLiteDatabaseMBS
```

Notes: This happens normally when you use "new SQLiteDatabaseMBS".

But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happened, yet.

So please simply add a line "dim d as new SQLiteDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

23.0.227 Textconverter returns only the first x characters. Why?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Some older Xojo versions limit the Textconverter to around 1024 characters in input and output. This should be fixed with RB5.

Notes:

Xojo seems not to support Textconverters at all on Windows.

23.0.228 The type translation between CoreFoundation/Foundation and Xojo data types.

Plugin Version: all, Platform: macOS.

Answer: The plugin does conversion between Cocoa/Carbon data types and native Xojo data types. The following list help you knowing what the current plugins support:

Notes: Cocoa NSObject to Variant:

nil ->nil
 NSDictionary ->Dictionary
 NSData ->MemoryBlock
 NSString ->String
 NSAttributedString ->NSAttributedStringMBS
 NSDate ->Date
 NSNumber ->double/integer/Int64/UInt64/UInt32/Boolean
 NSURL ->String
 NSValue with NSRect ->NSRectMBS
 NSValue with NSPoint ->NSPointMBS
 NSValue with NSSize ->NSSizeMBS
 NSValue with NSRange ->NSRangeMBS
 NSValue with QTTime ->QTTimeMBS
 NSValue with QTTimeRange ->QTTimeRangeMBS
 NSArray ->Array of Variant
 QuartzFilter ->QuartzFilterMBS

- ->*MBS

Variant to Cocoa NSObject:

nil ->nil
 Dictionary ->NSDictionary
 Boolean ->NSNumber
 Integer ->NSNumber
 Color ->NSColor
 Int64 ->NSNumber
 Single ->NSNumber
 Double ->NSNumber
 Date ->NSDate
 MemoryBlock ->NSData
 String ->NSString
 NSImageMBS ->NSImage
 NSAttributedStringMBS ->NSAttributedString
 NSColorMBS ->NSColor
 NSRectMBS ->NSValue with NSRect
 NSSizeMBS ->NSValue with NSSize

NSPointMBS ->NSValue with NSPoint
 NSRangeMBS ->NSValue with NSRange
 NSBurnMBS ->NSBurn
 NSViewMBS ->NSView
 NSFontMBS ->NSFont
 NSParagraphStyleMBS ->NSParagraphStyle
 NSAttributedStringMBS ->NSAttributedString
 WebPolicyDelegateMBS ->WebPolicyDelegate
 WebUIDelegateMBS ->WebUIDelegate
 WebFrameLoadDelegateMBS ->WebFrameLoadDelegate
 WebResourceLoadDelegateMBS ->WebResourceLoadDelegate
 NSIndexSetMBS ->NSIndexSet
 QTTimeMBS ->QTTime
 QTTimeRangeMBS ->QTTimeRange
 Array of Variant ->NSArray
 Array of String ->NSArray
 CFStringMBS ->NSString
 CFNumberMBS ->NSNumber
 CFDataMBS ->NSData
 CFURLMBS ->NSURL
 CFArrayMBS ->NSArray
 CFDictionaryMBS ->NSDictionary
 CFBinaryDataMBS ->NSData

Carbon CTypeRef to Variant:

CFDictionaryRef ->Dictionary
 CFStringRef ->String
 CFDataRef ->String
 CFURL ->String
 CFNumber ->Integer/Double/Int64
 CFArray ->Array
 CFDate ->date
 nil ->nil
 CGColorSpace ->CGColorSpaceMBS
 CGColor ->CGColorMBS
 CGImage ->CGImageMBS
 CF* ->CF*MBS

Variant to Carbon CTypeRef:

Dictionary ->CFDictionaryRef
 Boolean ->CFBooleanRef
 Color ->CFNumberRef
 Integer ->CFNumberRef

Int64 ->CFNumberRef
 Single ->CFNumberRef
 Double ->CFNumberRef
 String ->CFStringRef
 Color ->CGColorRef
 Date ->CFDateRef
 nil ->nil
 Memoryblock ->CFDataRef
 FolderItem ->CFURLRef
 Dictionary ->CFDictionaryRef
 Array of Variant/String/Date/Double/Single/Int64/Integer ->CFArray
 CGRectMBS ->CGRect as CFDataRef
 CGSizeMBS ->CGSize as CFDataRef
 CGPointMBS ->CGPoint as CFDataRef
 CGColorMBS ->CGColor
 CGColorSpaceMBS ->CGColorSpace
 CGImageMBS ->CGImage
 CGDataConsumerMBS ->CGDataConsumer
 CGDataProviderMBS ->CGDataProvider
 CF*MBS ->CF*

Strings without encodings should be put into dictionaries as memoryblocks.

23.0.229 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Platform: Windows.

Answer: If you see errors like a simple "Segmentation Fault" on Linux or some other wired errors, you may want to check your FTP upload mode. It must be binary for web apps. ASCII mode corrupts the application.

23.0.230 What classes to use for hotkeys?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.

Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

23.0.231 What do I need for Linux to get picture functions working?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In order to get our plugins working on Linux systems without GUI, the plugin loads graphics

libraries dynamically.

Notes: To get it working, the plugin tries to load gtk with this paths:

- libgtk-x11-2.0.so”
- libgtk-x11-2.0.so.0”
- /usr/lib/libgtk-x11-2.0.so”
- /usr/lib32/libgtk-x11-2.0.so”
- /usr/lib/libgtk-x11-2.0.so.0”
- /usr/lib32/libgtk-x11-2.0.so.0”

gdk is loaded with this paths:

- libgdk-x11-2.0.so”
- libgdk-x11-2.0.so.0”
- /usr/lib/libgdk-x11-2.0.so”
- /usr/lib32/libgdk-x11-2.0.so”
- /usr/lib/libgdk-x11-2.0.so.0”
- /usr/lib32/libgdk-x11-2.0.so.0”

For the paths without explicit path, the system will search in /lib, /usr/lib and all directories in the LD_LIBRARY_PATH environment variable.

23.0.232 What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

23.0.233 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Platform: macOS.

Answer:

Xojo 4.5 has a constant "SmallSystem" to use for a font name.

For older versions try this code:

Example:

```

Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef
fontName as Integer)
dim err as Integer
dim theFont, theFontSize, theFontStyle as MemoryBlock

const smSystemScript = -1

Declare Function GetThemeFont Lib "Carbon" (inFontID as Integer, inScript as Integer, outFontName
as Ptr, outFontSize as Ptr, outStyle as Ptr) as Integer

theFont = NewMemoryBlock(256) //Str255
theFontSize = NewMemoryBlock(2) //SInt16
theFontStyle = NewMemoryBlock(1) //Style

err = GetThemeFont(fontType, smSystemScript, theFont, theFontSize, theFontStyle)

if err = 0 then
fontName = theFont.PString(0)
fontSize = theFontSize.UShort(0)
fontStyle = theFontStyle.Byte(0)
else
fontName = ""
fontSize = 0
fontStyle = 0
end if
End Sub

```

23.0.234 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Platform: Windows.

Answer: Last Version with 10.4 support is version 15.4.

Notes: With version 15.4 you can build applications for OS X 10.4 and newer.

For Version 16.0 we disabled 10.4 and moved minimum to 10.5. We may be able to enable it again to build a version of 16.x, but may need to charge for this by hour.

23.0.235 What is last plugin version to run on PPC?

Plugin Version: all, Platform: Windows.

Answer: Last Version with PPC is 15.4.

Notes: With version 15.4 you can build PPC applications for OS X 10.4 and newer.

For Version 16.0 we disabled PPC. We may be able to enable it again to build a PPC version of 16.x, but may need to charge for this by hour.

23.0.236 What is last version of the plugins for macOS 32-bit?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use version 23.0 or older.

Notes: We stopped including 32-bit code for macOS in version 23.1. Please use older versions if you use an old Xojo.

Xojo 2017r3 and newer load our 64-bit plugins.

23.0.237 What is the difference between Timer and WebTimer?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Timer is server side and WebTimer client side.

Notes: Timer is the normal timer class in Xojo. It runs on the server. On the client side the WebTimer runs on the client. It triggers a request to the server to perform the action. So a WebTimer is good to keep the connection running and the website updated regularly. A timer on the server is good to make regular jobs like starting a database backup every 24 hours.

23.0.238 What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below is a list of function names known by LibXL.

Notes: LibXL parses the functions and writes tokens to the excel file. So even if Excel can do more functions, we can only accept the ones known by LibXL.

ABS, ABSREF, ACOS, ACOSH, ACTIVE.CELL, ADD.BAR, ADD.COMMAND, ADD.MENU, ADD.TOOLBAR, ADDRESS, AND, APP.TITLE, AREAS, ARGUMENT, ASC, ASIN, ASINH, ATAN, ATAN2, ATANH, AVEDEV, AVERAGE, AVERAGEA, BAHTTEXT, BETADIST, BETAINV, BINOMDIST, BREAK, CALL, CALLER, CANCEL.KEY, CEILING, CELL, CHAR, CHECK.COMMAND, CHIDIST, CHIINV, CHITEST, CHOOSE, CLEAN, CODE, COLUMN, COLUMNS, COMBIN, CONCATENATE, CONFIDENCE, CORREL, COS, COSH, COUNT, COUNTA, COUNTBLANK, COUNTIF, COVAR, CREATE.OBJECT, CRITBINOM, CUSTOM.REPEAT, CUSTOM.UNDO, DATE, DATEDIF, DATESTRING, DATEVALUE, DAVERAGE, DAY, DAYS360, DB, DBCS, DCOUNT, DCOUNTA, DDB, DEGREES, DELETE.BAR, DELETE.COMMAND, DELETE.MENU, DELETE.TOOLBAR, DEREf, DEVSQ, DGET, DIALOG.BOX, DIRECTORY, DMAX, DMIN, DOCUMENTS, DOLLAR, DPRODUCT, DSTDEV, DSTDEVP, DSUM, DVAR, DVARP, ECHO, ELSE, ELSE.IF, ENABLE.COMMAND, ENABLE.TOOL, END.IF, ERROR, ERROR.TYPE, EVALUATE, EVEN, EXACT, EXEC, EXECUTE, EXP, EXPONDIST, FACT, FALSE, FCLOSE, FDIST, FILES, FIND, FINDB, FINV, FISHER, FISHERINV, FIXED, FLOOR, FOPEN, FOR, FOR.CELL, FORECAST,

FORMULA.CONVERT, FPOS, FREAD, FREADLN, FREQUENCY, FSIZE, FTEST, FV, FWRITE, FWRITELN, GAMMADIST, GAMMAINV, GAMMALN, GEOMEAN, GET.BAR, GET.CELL, GET.CHART.ITEM, GET.DEF, GET.DOCUMENT, GET.FORMULA, GET.LINK.INFO, GET.MOVIE, GET.NAME, GET.NOTE, GET.OBJECT, GET.PIVOT.FIELD, GET.PIVOT.ITEM, GET.PIVOT.TABLE, GET.TOOL, GET.TOOLBAR, GET.WINDOW, GET.WORKBOOK, GET.WORKSPACE, GETPIVOTDATA, GOTO, GROUP, GROWTH, HALT, HARMEAN, HELP, HLOOKUP, HOUR, HYPERLINK, HYPGEOMDIST, IF, INDEX, INDIRECT, INFO, INITIATE, INPUT, INT, INTERCEPT, IPMT, IRR, ISBLANK, ISERR, ISERROR, ISLOGICAL, ISNA, ISNONTEXT, ISNUMBER, ISPMT, ISREF, ISTEXT, ISTHAIDIGIT, KURT, LARGE, LAST.ERROR, LEFT, LEFTB, LEN, LENB, LINEST, LINKS, LN, LOG, LOG10, LOGEST, LOGINV, LOGNORMDIST, LOOKUP, LOWER, MATCH, MAX, MAXA, MDETERM, MEDIAN, MID, MIDB, MIN, MINA, MINUTE, MINVERSE, MIRR, MMULT, MOD, MODE, MONTH, MOVIE.COMMAND, N, NA, NAMES, NEGBINOMDIST, NEXT, NORMDIST, NORMINV, NORMSDIST, NORMSINV, NOT, NOTE, NOW, NPER, NPV, NUMBERSTRING, ODD, OFFSET, OPEN.DIALOG, OPTIONS.LISTS.GET, OR, PAUSE, PEARSON, PERCENTILE, PERCENTRANK, PERMUT, PHONETIC, PI, PIVOT.ADD.DATA, PMT, POISSON, POKE, POWER, PPMT, PRESS.TOOL, PROB, PRODUCT, PROPER, PV, QUARTILE, RADIANS, RAND, RANK, RATE, REFTTEXT, REGISTER, REGISTER.ID, RELREF, RENAME.COMMAND, REPLACE, REPLACEB, REPT, REQUEST, RESET.TOOLBAR, RESTART, RESULT, RESUME, RETURN, RIGHT, RIGHTB, ROMAN, ROUND, ROUNDBAHTDOWN, ROUNDBAHTUP, ROUNDDOWN, ROUNDUP, ROW, ROWS, RSQ, RTD, SAVE.DIALOG, SAVE.TOOLBAR, SCENARIO.GET, SEARCH, SEARCHB, SECOND, SELECTION, SERIES, SET.NAME, SET.VALUE, SHOW.BAR, SIGN, SIN, SINH, SKEW, SLN, SLOPE, SMALL, SPELLING.CHECK, SQRT, STANDARDIZE, STDEV, STDEVA, STDEVP, STDEVPA, STEP, STEYX, SUBSTITUTE, SUBTOTAL, SUM, SUMIF, SUMPRODUCT, SUMSQ, SUMX2MY2, SUMX2PY2, SUMXMY2, SYD, T, TAN, TANH, TDIST, TERMINATE, TEXT, TEXT.BOX, TEXTREF, THAIDAYOFWEEK, THAIDIGIT, THAIMONTHOFYEAR, THAINUMSOUND, THAINUMSTRING, THAISTRINGLENGTH, THAIYEAR, TIME, TIMEVALUE, TINV, TODAY, TRANSPOSE, TREND, TRIM, TRIMMEAN, TRUE, TRUNC, TTEST, TYPE, UNREGISTER, UPPER, USDOLLAR, USERDEFINED, VALUE, VAR, VARA, VARP, VARPA, VDB, VIEW.GET, VLOOKUP, VOLATILE, WEEKDAY, WEIBULL, WHILE, WINDOW.TITLE, WINDOWS, YEAR and ZTEST.

23.0.239 What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

Answer: Use the SoftDeclareMBS class to load libraries dynamically.

23.0.240 What to do on Xojo reporting a conflict?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

Xojo just wants to tell you that you dropped something in the plugins folder what is not a plugin.

Notes:

Some users dropped the examples, the documentation or other files into the plugins folder. Don't do it.

23.0.241 What to do with a NSImageCacheException?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You need to add exception handlers for NSExcptionMBS in order to catch this exception.

Notes: You may also add code to write the stack of the exception into a log file for later locating the error source.

A NSImage has several image representations in memory. So basicly you pass in the base image and for whatever size an image is needed, the NSImage class will create a cache image representation of the requested size so on the next query it can use that cache for the same requested size.

23.0.242 What to do with MySQL Error 2014?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can get this error on MySQL if you have a recordset open while you create another one.

23.0.243 What to do with SQL Plugin reporting Malformed string as error?

Plugin Version: all, Platform: macOS.

Answer: Please make sure the table and/or database fields have a text encoding set.

Notes: For Firebird our plugin tries to use UTF-8 encoding if possible and to correctly convert between various tables, the tables and their fields need to have a text encoding defined.

e.g. if the text field in the table is windows-1252 and the other ISO 8859-5, then the Firebird database can convert them to UTF-8 and deliver texts to the plugin.

If encoding is set to none, it may get confused for non-ascii text.

23.0.244 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetActiveDisplayList.

23.0.245 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithPoint.

23.0.246 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithRect.

23.0.247 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetOnlineDisplayList.

23.0.248 Where is GetObjectClassNameMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use this replacement method:

Example:

```
Function GetObjectClassNameMBS(o as Object) As string
dim t as Introspection.TypeInfo = Introspection.GetType(o)
Return t.FullName
End Function
```

Notes: GetObjectClassNameMBS was removed from the plugins.

23.0.249 Where is NetworkAvailableMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We removed NetworkAvailableMBS some versions ago. It was not working right and basically it's not useful. If you want to check whether you have a network, than do a DNS resolve:

Example:

```

// two independent domain names
const domain1 = "www.google.com"
const domain2 = "www.macsw.de"

// resolve IPs
dim ip1 as string = DNSNameToAddressMBS(Domain1)
dim ip2 as string = DNSNameToAddressMBS(Domain2)

// if we got IPs and not the same IPs (error/login pages)
if len(ip1)=0 or len(ip2)=0 or ip1=ip2 then
MsgBox "no connection"
else
MsgBox "have connection"
end if

```

Notes: This way you can detect whether you got something from DNS. And you can make sure that a DNS redirection to a login page won't catch you.

23.0.250 Where is StringHeight function in DynaPDF?

Plugin Version: all, Platform: Windows.

Answer: Use the function GetFTextHeight or GetFTextHeightEx.

Notes: Be aware that GetFTextHeight works with format commands and you may want to escape your text if you don't use them.

23.0.251 Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

Answer: This class has been removed in favor of XLBookMBS class.

Notes: This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

23.0.252 Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Please visit this web page:

<http://www.wotsit.org>

23.0.253 Where to register creator code for my application?

Plugin Version: all, Platform: macOS.

Answer:

Register at Apple:

<http://developer.apple.com/dev/cftype/information.html>

23.0.254 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some frameworks from Mac OS X do not support 32 bit applications, so we can't provide plugins for Xojo until 64bit target is available.

Notes: For Mac OS X 10.8:

- Accounts
- EventKit
- GLKit
- Social

and in 10.9:

- Accounts
- AVKit
- EventKit
- GameController
- GLKit
- MapKit
- MediaLibrary
- Social
- SpriteKit

In general Apple makes all new frameworks being 64 bit only.

23.0.255 Which plugins are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some of our plugins work only in 64 bit modes as operation systems do not provide 32 bit code.

Notes: This effects currently: EventKit, Accounts, Social frameworks from Apple and our matching plugins.

23.0.256 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install DirectX from Microsoft on your Windows.

23.0.257 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install the Internet Explorer from Microsoft on your Windows.

Notes: This bug is for several older Windows 95 editions.

23.0.258 Why do I hear a beep on keydown?

Plugin Version: all, Platform: Windows.

Answer: When the user presses a key, RB goes through all keydown event handlers till on returns true.

Notes: If no keydown event handler returns true for the key, a beep is performed.

23.0.259 Why does folderitem.item return nil?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Because Xojo fails to make a folderitem for you. Reason may be an alias file which can't be resolved or simply that you don't have enough access rights to read the folder content.

Notes: A more rarely reason is that the directory changed and the file with the given index or name does no longer exist.

23.0.260 Why doesn't showurl work?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

There are three main reasons:

1. showurl is not supported by Xojo in 68k applications.
2. there is now application defined for the protocol (e.g. http) in the Internet Control panel.
3. You don't have Internet Config installed.

You can use the InternetConfigMBS class to check for this stuff.

23.0.261 Why don't the picture functions not work on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please make sure libcairo is installed.

Notes: For accessing pictures on Linux, the MBS Plugin relays on the cairo library.

Please install the package if you don't have it already.

Our plugin looks for library called libcairo.so or libcairo.so.2.

23.0.262 Why have I no values in my chart?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You have no data points visible, there may be several reasons:

Notes: For example one of the data values may be infinite or invalid.

Or the scaling may be out of range, so you simply see nothing.

23.0.263 Will application size increase with using plugins?

Plugin Version: all, Platform: Windows.

Answer: All plugins used by your application will be included in the application.

Notes: If you use no plugins, your application will not change size.

And if you use one class from the plugins, your application size will increase by a few kilobytes.

The documentation of the plugins include a list of all plugin parts and their sizes for the different platforms.

23.0.264 XLS: Custom format string guidelines

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. Four sections example:

```
#,###.00_); [ Red ] (#,###.00);0.00;"sales "@
```

The following table describes the different symbols that are available for use in custom number formats.

Specify colors

To set the text color for a section of the format, type the name of one of the following eight colors in square brackets in the section. The color code must be the first item in the section.

Instead of using the name of the color, the color index can be used, like this [Color3] for Red. Valid numeric indexes for color range from 1 to 56, which reference by index to the legacy color palette.

Specify conditions

To set number formats that will be applied only if a number meets a specified condition, enclose the condition in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; >Greater than; <Less than; >= Greater than or equal to, <= Less than or equal to, and <>Not equal to. For example, the following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.

```
[ Red ] [ <=100 ] ; [ Blue ] [ >100 ]
```

If the cell value does not meet any of the criteria, then pound signs ("##") are displayed across the width of the cell.

Dates and times

Examples

23.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

Answer: Please upgrade your Windows version.

23.0.266 Xojo or my RB application itself crashes on launch on Mac OS Classic.
Why?

Plugin Version: all.

Answer:

You may check if the application has enough memory to be loaded.

RB should have on Mac OS Classic more than 20 MB of RAM.

I preferred to use 50 MB and for an application a 10 MB partition is a good way to start.

Parameter	Description
x	The x value of the data point. For an enumerated x-axis (see <code>Axis.setLabels</code> on what is an enumerated axis), the first data point is 0, and the nth data point is (n-1).
xLabel	The bottom x-axis label of the data point.
x2Label	The top x-axis label of the data point.
value	The value of the data point.
accValue	The sum of values of all data points that are in the same x position and same data group as the current data point, and with data set number less than or equal to the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
totalValue	The sum of values of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
percent	The percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
accPercent	The accumulated percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
gpercent	The percentage of the data point based on the total value of all data points in a layer.
dataSet	The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1).
dataSetName	The name of the data set to which the data point belongs.
dataItem	The data point number within the data set. The first data point is 0. The nth data point is (n-1).
dataGroup	The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1).
dataGroupName	The name of the data group to which the data point belongs.
layerId	The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1).
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using <code>Layer.addExtraField</code> , <code>Layer.addExtraField2</code> , <code>BaseChart.addExtraField</code> or <code>BaseChart.addExtraField2</code> .

diFieldN	Same as fieldN. See above.
dsFieldN	Similar to fieldN, except that dsFieldN means the extra field is indexed by data set number. The Pth data set corresponds to the Pth element of the extra field.
dsdiFieldN	Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth data set corresponds to the Pth element of the (N + Q)th extra field.

Parameter	Description
zx	The symbol scale in the x dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .
zy	The symbol scale in the y dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .
z	The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .

Parameter	Description
slope	The slope of the trend line.
intercept	The y-intercept of the trend line.
corr	The correlation coefficient in linear regression analysis.
stderr	The standard error in linear regression analysis.

Parameter	Description
top	The value of the top edge of the box-whisker symbol.
bottom	The value of the bottom edge of the box-whisker symbol.
max	The value of the maximum mark of the box-whisker symbol.
min	The value of the minimum mark of the box-whisker symbol.
med	The value of the median mark of the box-whisker symbol.

Parameter	Description
high	The high value.
low	The low value.
open	The open value.
close	The close value.

Parameter	Description
dir	The direction of the vector.
len	The length of the vector.

Parameter	Description
radius	The radial value of the data point.
value	Same as { radius } . See above.
angle	The angular value of the data point.
x	Same as { angle } . See above.
label	The angular label of the data point.
xLabel	Same as { label } . See above.
name	The name of the layer to which the data point belongs.
dataSetName	Same as { name } . See above.
i	The data point number. The first data point is 0. The nth data point is (n-1).
dataItem	Same as { i } . See above.
z	The symbol scale. Applicable for layers with symbol scales set by Polar-Layer.setSymbolScale.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2.
diFieldN	Same as fieldN. See above.
dsFieldN	Similar to fieldN, except that dsFieldN means the extra field is indexed by layer index. The Pth layer corresponds to the Pth element of the extra field.
dsdiFieldN	Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth layer corresponds to the Pth element of the (N + Q)th extra field.
Parameter	Description
dir	The direction of the vector.
len	The length of the vector.
Parameter	Description
value	The axis value at the tick position.
label	The axis label at the tick position.
Parameter	Description
[param]	The name of the parameter
[a]	If this field a number, it specifies the number of decimal places (digits to the right of the decimal point).

[b]	The thousand separator. Should be a non-alphanumeric character (not 0-9, A-Z, a-z). Use ' '.
textasciitilde ' for no thousand separator. The default is ' '.	
textasciitilde ', which can be modified using BaseChart.setNumberFormat.	
[c]	The decimal point character. The default is '.', which can be modified using BaseChart.setNumberFormat.
[d]	The negative sign character. Use ' '.
textasciitilde ' for no negative sign character. The default is '-', which can be modified using BaseChart.setNumberFormat.	

Parameter	Description
yyyy	The year in 4 digits (e.g. 2002)
yyy	The year showing only the least significant 3 digits (e.g. 002 for the year 2002)
yy	The year showing only the least significant 2 digits (e.g. 02 for the year 2002)
y	The year showing only the least significant 1 digits (e.g. 2 for the year 2002)
mmm	The month formatted as its name. The default is to use the first 3 characters of the english month name (Jan, Feb, Mar ...). The names can be configured using BaseChart.setMonthNames.
mm	The month formatted as 2 digits from 01 - 12, adding leading zero if necessary.
m	The month formatted using the minimum number of digits from 1 - 12.
MMM	The first 3 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
MM	The first 2 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
M	The first character of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
dd	The day of month formatted as 2 digits from 01 - 31, adding leading zero if necessary.
d	The day of month formatted using the minimum number of digits from 1 - 31.
w	The name of the day of week. The default is to use the first 3 characters of the english day of week name (Sun, Mon, Tue ...). The names can be configured using BaseChart.setWeekDayNames.
hh	The hour of day formatted as 2 digits, adding leading zero if necessary. The 2 digits will be 00 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
h	The hour of day formatted using the minimum number of digits. The digits will be 0 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
nn	The minute formatted as 2 digits from 00 - 59, adding leading zero if necessary.
n	The minute formatted using the minimum number of digits from 00 - 59.
ss	The second formatted as 2 digits from 00 - 59, adding leading zero if necessary.
s	The second formatted using the minimum number of digits from 00 - 59.
a	Display either 'am' or 'pm', depending on whether the time is in the morning or afternoon. The text 'am' and 'pm' can be modified using BaseChart.setAMPM.

Shape Id	Value	Description
SquareShape	1	Square shape. See (1, 1) above.
DiamondShape	2	Diamond shape. See (2, 1) above.
TriangleShape	3	Triangle shape pointing upwards. See (3, 1) above.
RightTriangleShape	4	Triangle shape pointing rightwards. See (4, 1) above.
LeftTriangleShape	5	Triangle shape pointing leftwards. See (5, 1) above.
InvertedTriangleShape	6	Triangle shape pointing downwards. See (1, 2) above.
CircleShape	7	Circle shape. See (2, 2) above.
StarShape	[Method]	Star shapes of various points. See (2, 3), (2, 4), (2, 5), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5) above for stars with 3 to 10 points.
PolygonShape	[Method]	Polygon shapes symmetrical about a vertical axis with a vertex at the top center position. See (4, 1), (4, 3), (4, 5), (5, 1) for polygons of 5 to 8 sides.
Polygon2Shape	[Method]	Polygon shapes symmetrical about a vertical axis but without any vertex at the top center position. See (4, 2), (4, 4) for polygons of 5 and 6 sides.
CrossShape	[Method]	'+' shapes. See (5, 2), (5, 3), (5, 4), (5, 5), (6, 1), (6, 2), (6, 3) for '+' shape with arm width of 0.1 - 0.7.
Cross2Shape	[Method]	'X' shapes. See (6, 4), (6, 5), (7, 1), (7, 2), (7, 3), (7, 4), (7, 5) for 'X' shapes with arm width of 0.1 - 0.7.

langEnglish	0	Roman script
langFrench	1	Roman script
langGerman	2	Roman script
langItalian	3	Roman script
langDutch	4	Roman script
langSwedish	5	Roman script
langSpanish	6	Roman script
langDanish	7	Roman script
langPortuguese	8	Roman script
langNorwegian	9	Roman script
langHebrew	10	Hebrew script
langJapanese	11	Japanese script
langArabic	12	Arabic script
langFinnish	13	Roman script
langGreek	14	Greek script using smRoman script code
langIcelandic	15	modified smRoman/Icelandic script
langMaltese	16	Roman script
langTurkish	17	modified smRoman/Turkish script
langCroatian	18	modified smRoman/Croatian script
langTradChinese	19	Chinese (Mandarin) in traditional characters
langUrdu	20	Arabic script
langHindi	21	Devanagari script
langThai	22	Thai script
langKorean	23	Korean script

Nan	Meaning
1	Invalid square root (negative number, usually)
2	Invalid addition (indeterminate such as infinity + (-infinity))
4	Invalid division (indeterminate such as 0/0)
8	Invalid multiplication (indeterminate such as 0*infinity)
9	Invalid modulo such as (a mod 0)
17	Try to convert invalid string to a number like val("x7")
33	Invalid argument in a trig function
34	Invalid argument in an inverse trig function
36	Invalid argument in a log function
37	Invalid argument in Pow function
38	Invalid argument in toolbox financial function
40	Invalid argument in hyperbolic function
42	Invalid argument in a gamma function

Symbol	Description and result
0	Digit placeholder. For example, if the value 8.9 is to be displayed as 8.90, use the format #.00
#	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall not display extra zeros when the number typed has fewer digits on either side of the decimal than there are # symbols in the format. For example, if the custom format is #.##, and 8.9 is in the cell, the number 8.9 is displayed.
?	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall put a space for insignificant zeros on either side of the decimal point so that decimal points are aligned in the column. For example, the custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in a column.
. (period)	Decimal point.
%	Percentage. If the cell contains a number between 0 and 1, and the custom format 0% is used, the application shall multiply the number by 100 and add the percentage symbol in the cell.
, (comma)	Thousands separator. The application shall separate thousands by commas if the format contains a comma that is enclosed by number signs (#) or by zeros. A comma that follows a placeholder scales the number by one thousand. For example, if the format is #.0,, and the cell value is 12,200,000 then the number 12.2 is displayed.
E- E+ e- e+	Scientific format. The application shall display a number to the right of the "E" symbol that corresponds to the number of places that the decimal point was moved. For example, if the format is 0.00E+00, and the value 12,200,000 is in the cell, the number 1.22E+07 is displayed. If the number format is #0.0E+0, then the number 12.2E+6 is displayed.
\$ -+/():space	Displays the symbol. If it is desired to display a character that differs from one of these symbols, precede the character with a backslash (\). Alternatively, enclose the character in quotation marks. For example, if the number format is (000), and the value 12 is in the cell, the number (012) is displayed.
\	Display the next character in the format. The application shall not display the backslash. For example, if the number format is 0\!, and the value 3 is in the cell, the value 3! is displayed.
*	Repeat the next character in the format enough times to fill the column to its current width. There shall not be more than one asterisk in one section of the format. If more than one asterisk appears in one section of the format, all but the last asterisk shall be ignored. For example, if the number format is 0*x, and the value 3 is in the cell, the value 3xxxxxx is displayed. The number of x characters that are displayed in the cell varies based on the width of the column.
_ (underline)	Skip the width of the next character. This is useful for lining up negative and positive values in different cells of the same column. For example, the number format _(0.0_);(0.0) aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses.
"text"	Display whatever text is inside the quotation marks. For example, the format 0.00 "dollars" displays 1.23 dollars when the value 1.23 is in the cell.
@	Text placeholder. If text is typed in the cell, the text from the cell is placed in the format where the at symbol (@) appears. For example, if the number format is "Bob "@ Smith" (including quotation marks), and the value "John" is in the cell, the value Bob John Smith is displayed.

[Black] [Green] [White] [Blue] [Magenta] [Yellow] [Cyan] [Red]

To display	As	Use this code
Months	1-12	m
Months	01-12	mm
Months	Jan-Dec	mmm
Months	January-December	mmmm
Months	J-D	mmmmm
Days	1-31	d
Days	01-31	dd
Days	Sun-Sat	ddd
Days	Sunday-Saturday	dddd
Years	00-99	yy
Years	1900-9999	yyyy
Hours	0-23	h
Hours	00-23	hh
Minutes	0-59	m
Minutes	00-59	mm
Seconds	0-59	s
Seconds	00-59	ss
Time	4 AM	h AM/PM
Time	4:36 PM	h:mm AM/PM
Time	4:36:03 P	h:mm:ss A/P
Time	4:36:03.75	h:mm:ss.00
Elapsed time	1:02	[h] :mm
Elapsed time	62:16	[mm] :ss
Elapsed time	3735.80	[ss] .00

To display	As	Use this code
1234.59	1234.6	#####.#
8.9	8.900	#.000
.631	0.6	0.#
12	12.0	#.0#
1234.568	1234.57	#.0#
44.398	44.398	???.???
102.65	102.65	???.???
2.8	2.8	???.???
5.25	5 1/4	# ??/??
5.3	5 3/10	# ??/??
12000	12,000	#,###
12000	12	#,
12400000	12.4	0.0,,