MBS Linux Plugin Documentation

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0.1 Introduction

This is the PDF version of the documentation for the Xojo (Real Studio) Plug-in from Monkeybread Software Germany. Plugin part: MBS Linux Plugin

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HTML Viewer Linux

4.1 class LinuxJavaScriptContextMBS

4.1.1 class LinuxJavaScriptContextMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The class for a javascript context. **Notes:** This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

4.1.2 Methods

4.1.3 CheckScriptSyntax(script as string, sourceURL as string = "", StartLineNumber as Integer = 0) as boolean

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Checks for syntax errors in a string of JavaScript. **Notes:**

script: A string containing the script to check for syntax errors.
sourceURL: A string containing a URL for the script’s source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script’s starting line number in the file located at sourceURL. This is only used when reporting exceptions.
exception: A string in which to store a syntax error exception, if any.
Returns true if the script is syntactically correct, otherwise false.
See also:

- 4.1.4 CheckScriptSyntax(script as string, sourceURL as string, StartLineNumber as Integer, byref
4.1.4 CheckScriptSyntax(script as string, sourceURL as string, StartLineNumber as Integer, byref JSExtension as string) as boolean

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Checks for syntax errors in a string of JavaScript.

**Notes:**

- script: A string containing the script to check for syntax errors.
- sourceURL: A string containing a URL for the script’s source file. This is only used when reporting exceptions. Pass ”” if you do not care to include source file information in exceptions.
- startingLineNumber: An integer value specifying the script’s starting line number in the file located at sourceURL. This is only used when reporting exceptions.
- exception: A string in which to store a syntax error exception, if any.

Returns true if the script is syntactically correct, otherwise false.

See also:

- 4.1.3 CheckScriptSyntax(script as string, sourceURL as string = ””, StartLineNumber as Integer = 0) as boolean

4.1.5 Constructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The private constructor.

4.1.6 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.1.7 EvaluateScript(script as string, sourceURL as string = ””, StartLineNumber as Integer = 0) as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Evaluates a string of JavaScript.

**Notes:**

- script: A string containing the script to evaluate.
- sourceURL: A string containing a URL for the script’s source file. This is only used when reporting exceptions. Pass ”” if you do not care to include source file information in exceptions.
- startingLineNumber: An integer value specifying the script’s starting line number in the file located at sourceURL. This is only used when reporting exceptions.
4.1. CLASS LINUXJAVASCRIPTCONTEXTMBS

exception A string in which to store an exception, if any.
Returns the value as string that results from evaluating script, or "" if an exception is thrown.
See also:

- 4.1.8 EvaluateScript(script as string, sourceURL as string, StartLineNumber as Integer, byref JSException as string) as string

4.1.8 EvaluateScript(script as string, sourceURL as string, StartLineNumber as Integer, byref JSException as string) as string

Notes:

script A string containing the script to evaluate.
sourceURL: A string containing a URL for the script’s source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script’s starting line number in the file located at sourceURL. This is only used when reporting exceptions.
exception A string in which to store an exception, if any.
Returns the value as string that results from evaluating script, or "" if an exception is thrown.
See also:

- 4.1.7 EvaluateScript(script as string, sourceURL as string = "", StartLineNumber as Integer = 0) as string

4.1.9 GarbageCollect

Notes: You should not need to call this.

4.1.10 Properties

4.1.11 Handle as Integer

Notes: (Read and Write property)
4.1.12 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent HTMLViewer.
**Notes:** (Read and Write property)
4.2. CLASS LINUXWEBBACKFORWARDLISTMBS

4.2. class LinuxWebBackForwardListMBS

4.2.1. class LinuxWebBackForwardListMBS


4.2.2. Methods

4.2.3. AddItem(item as LinuxWebHistoryItemMBS)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Adds the item to the WebBackForwardList.

4.2.4. BackItem as LinuxWebHistoryItemMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Returns the item that precedes the current item.

4.2.5. BackLength as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Returns the number of items that precede the current item.

4.2.6. Clear

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Clears the webBackForwardList by removing all its elements. **Notes**: Note that not even the current page is kept in list when cleared so you would have to add it later. This method also clears the list of visited links which means that all links will appear unvisited.

4.2.7. Constructor(webview as LinuxWebViewMBS)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Creates an instance of the back forward list with a controlling WebView.
4.2.8 **ContainsItem(item as LinuxWebHistoryItemMBS) as boolean**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Checks if item is in the back forward list.

4.2.9 **CurrentItem as LinuxWebHistoryItemMBS**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The current item. **Notes:** Returns a nil value if the back forward list is empty.

4.2.10 **Destructor**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.2.11 **ForwardItem as LinuxWebHistoryItemMBS**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The next item forward in the list. **Notes:** Returns a nil value if there nothing that succeeds the current item.

4.2.12 **ForwardLength as Integer**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the number of items that succeed the current item.

4.2.13 **GoBack**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Steps backward in the back forward list.

4.2.14 **GoForward**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Steps forward in the back forward list.
4.2. CLASS LINUXWEBBACKFORWARDLISTMBS

4.2.15 GoToItem(item as LinuxWebHistoryItemMBS)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Go to the specified item in the back forward list.

4.2.16 Item(index as Integer) as LinuxWebHistoryItemMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the item at a given index relative to the current item.

4.2.17 Properties

4.2.18 Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference. **Notes:** (Read and Write property)

4.2.19 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent htmlviewer. **Notes:** (Read and Write property)

4.2.20 Limit as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The maximum limit of the back forward list. **Notes:** (Read and Write computed property)
4.3  class LinuxWebCookieMBS

4.3.1  class LinuxWebCookieMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The class for a cookie used with WebKit on Linux.

**Example:**

```vbs
Dim c As New LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox c.Expires.ShortDate+" "+c.Expires.ShortTime
```

**Notes:**

LinuxWebCookieMBS implements HTTP cookies, primarily as described by the original Netscape cookie specification, but with slight modifications based on RFC 2109, Microsoft’s HttpOnly extension attribute, and observed real-world usage (and, in particular, based on what Firefox does).

An HTTP cookie.

name and value will be set for all cookies. If the cookie is generated from a string that appears to have no name, then name will be the empty string.

domain and path give the host or domain, and path within that host/domain, to restrict this cookie to. If domain starts with ".", that indicates a domain (which matches the string after the ",", or any hostname that has domain as a suffix). Otherwise, it is a hostname and must match exactly.

expires will be non-nil if the cookie uses either the original "expires" attribute, or the "max-age" attribute specified in RFC 2109. If expires is nil, it indicates that neither "expires" nor "max-age" was specified, and the cookie expires at the end of the session.

If http_only is set, the cookie should not be exposed to untrusted code (eg, javascript), so as to minimize the danger posed by cross-site scripting attacks.

4.3.2  Methods

4.3.3  Constructor(name as string, value as string, domain as string, path as string, maxAge as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new cookie with the given attributes.
4.3. CLASS LINUXWEBCOOKIEMBS

Example:

```vba
Dim c As New LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox str(c.Name)
```

Notes:

Use Secure and HTTPOnly properties if you need to set those attributes on the returned cookie.

maxAge is used to set the "expires" attribute on the cookie; pass -1 to not include the attribute (indicating that the cookie expires with the current session), 0 for an already-expired cookie, or a lifetime in seconds. You can use the constants kMaxAgeHour, kMaxAgeDay, kMaxAgeWeek and kMaxAgeYear (or multiples thereof) to calculate this value. (If you really care about setting the exact time that the cookie will expire, use Expire property.)

name: cookie name
value: cookie value
domain: cookie domain or hostname
path: cookie path, or ","
maxage: max age of the cookie, or -1 for a session cookie

4.3.4 Copy as LinuxWebCookieMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a copy. **Notes:** If you want to edit an existing cookie, please make a copy first.

4.3.5 Destructor

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.3.6 Equal(other as LinuxWebCookieMBS) as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Compares two cookies. **Notes:** Returns true if they are equal.
4.3.7 SetMaxAge(value as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Sets cookie’s max age to value.

**Example:**

```vbs
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Hour)
c.SetMaxAge(c.kMaxAge-Week)
MsgBox c.ToSetCookieHeader
```

**Notes:**

If max_age is -1, the cookie is a session cookie, and will expire at the end of the client’s session. Otherwise, it is the number of seconds until the cookie expires. You can use the constants kMaxAgeHour, kMaxAgeDay, kMaxAgeWeek and kMaxAgeYear (or multiples thereof) to calculate this value. (A value of 0 indicates that the cookie should be considered already-expired.)

(This sets the same property as Expire.)

4.3.8 ToCookieHeader as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Serializes cookie in the format used by the Cookie header (ie, for returning a cookie from to a server).

**Example:**

```vbs
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox c.ToCookieHeader
```

4.3.9 ToSetCookieHeader as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Serializes cookie in the format used by the Set-Cookie header (ie, for sending a cookie from to a client).

**Example:**

```vbs
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox c.ToSetCookieHeader
```
4.3. CLASS LINUXWEBCOOKIEMBS

4.3.10 Properties

4.3.11 Handle as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read and Write property)

4.3.12 Owner as Variant

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The owner of this object.
**Notes:** (Read and Write property)

4.3.13 Domain as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The domain text.
**Example:**

```vba
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox str(c.Domain)
```
**Notes:** (Read and Write computed property)

4.3.14 Expires as date

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The expiration time.
**Example:**

```vba
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox c.Expires.ShortDate+" "+c.Expires.ShortTime
```
**Notes:**
If expires is nil, cookie will be a session cookie and will expire at the end of the client’s session.
(Read and Write computed property)
4.3.15  HTTPOnly as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The httponly attribute.
**Notes:**
If true, cookie will be marked as "http only", meaning it should not be exposed to web page scripts or other untrusted code.
(Read and Write computed property)

4.3.16  Name as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The name of the cookie.
**Example:**
```pascal
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox str(c.Name)
```
**Notes:** (Read and Write computed property)

4.3.17  Path as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The path of the cookie.
**Example:**
```pascal
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "test", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox str(c.Path)
```
**Notes:** (Read and Write computed property)

4.3.18  Secure as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The secure attribute.
**Example:**
4.3. CLASS LINUXWEBCOOKIEMBS

```vbnet
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox str(c.Secure)
c.Secure = true
MsgBox str(c.Secure)
```

**Notes:**
Cookie will only be transmitted from the client to the server over secure (https) connections if secure is true. (Read and Write computed property)

### 4.3.19 Value as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The value of the cookie. **Example:**

```vbnet
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", ",", LinuxWebCookieMBS.kMaxAge-Week)
MsgBox str(c.Value)
```

**Notes:** (Read and Write computed property)

### 4.3.20 Constants

#### 4.3.21 kMaxAgeDay = 86400

Plugin Version: 12.4. **Function:** A constant for one day in seconds.

#### 4.3.22 kMaxAgeHour = 3600

Plugin Version: 12.4. **Function:** A constant for one hour in seconds.

#### 4.3.23 kMaxAgeWeek = 604800

Plugin Version: 12.4. **Function:** A constant for one week in seconds.
4.3.24  kMaxAgeYear = 31556926

Plugin Version: 12.4. **Function:** A constant for one year in seconds.
4.4. CLASS LINUXWEBCOOKIESTOREMBS

4.4 class LinuxWebCookieStoreMBS

4.4.1 class LinuxWebCookieStoreMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The store for cookies.  
**Example:**

```vbnet
dim store as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore
dim cookies() as LinuxWebCookieMBS = store.AllCookies
MsgBox str(UBound(cookies)+1)+" cookies"
```

4.4.2 Methods

4.4.3 AddCookie(cookie as LinuxWebCookieMBS)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Adds cookie to store.

4.4.4 AllCookies as LinuxWebCookieMBS()

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns an array with all cookies.  
**Example:**

```vbnet
// show all cookies
dim store as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore
dim cookies(-1) as LinuxWebCookieMBS = store.AllCookies
dim lines() as string
for each c as LinuxWebCookieMBS in cookies
    lines.Append c.ToSetCookieHeader
next
MsgBox Join(lines,EndOfLine)
```

4.4.5 Available as Boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns true if the plugin found all functions for the web cookie store.
4.4.6 Constructor

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new cookie store.  
**Notes:** The base LinuxWebCookieStoreMBS class does not support persistent storage of cookies; use a subclass for that.

4.4.7 CookieStore as LinuxWebCookieStoreMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Queries the default cookie store.  
**Example:**
```vba
Dim w as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore

MsgBox "AcceptPolicy:" & str(w.AcceptPolicy)
w.AcceptPolicy = w.kAcceptNoThirdParty
MsgBox "AcceptPolicy:" & str(w.AcceptPolicy)
```

4.4.8 DeleteAllCookies

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Deletes all cookies.  
**Example:**
```vba
Dim w as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore
w.DeleteAllCookies
```

4.4.9 DeleteCookie(cookie as LinuxWebCookieMBS)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Deletes cookie.

4.4.10 Destructor

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.
4.4. CLASS LINUXWEBCOOKIESTOREMBS

4.4.11 SetCookieStore(newStore as LinuxWebCookieStoreMBS)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Makes the given cookie store the default one.

4.4.12 Properties

4.4.13 Handle as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read and Write property)

4.4.14 Owner as Variant

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The owner of this object.
**Notes:** (Read and Write property)

4.4.15 AcceptPolicy as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get/set the policy for accepting cookies.
**Example:**

```vba
dim w as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore

MsgBox "AcceptPolicy: "+str(w.AcceptPolicy)
w.AcceptPolicy = w.kAcceptNoThirdParty
MsgBox "AcceptPolicy: "+str(w.AcceptPolicy)
```

**Notes:** (Read and Write computed property)
4.4.16 Constants

4.4.17 kAcceptAlways = 0

Plugin Version: 12.4. **Function:** One of the cookie accept modes.  
**Notes:** Accept all cookies unconditionally.

4.4.18 kAcceptNever = 1

Plugin Version: 12.4. **Function:** One of the cookie accept modes.  
**Notes:** Reject all cookies unconditionally.

4.4.19 kAcceptNoThirdParty = 2

Plugin Version: 12.4. **Function:** One of the cookie accept modes.  
**Notes:**  
No Third party cookies.  
Accept all cookies set by the main document loaded in the application using librsoap. An example of the most common case, web browsers, would be: If http://www.example.com is the page loaded, accept all cookies set by example.com, but if a resource from http://www.third-party.com is loaded from that page reject any cookie that it could try to set. For librsoap to be able to tell apart first party cookies from the rest, the application must call soup_message_set_first_party() on each outgoing SoupMessage, setting the SoupURI of the main document. If no first party is set in a message when this policy is in effect, cookies will be assumed to be third party by default. (this is done by webkit)
4.5  CLASS LINUXWEBDATASOURCEMBS

4.5  class LinuxWebDataSourceMBS

4.5.1  class LinuxWebDataSourceMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Data source encapsulates the content of a WebFrame. **Notes:** A WebFrame has a main resource and subresources and the data source provides access to these resources. When a request gets loaded initially, it is set to a provisional state. The application can request for the request that initiated the load by asking for the provisional data source and invoking the InitialRequest method of DataSource. This data source may not have enough data and some methods may return empty values. To get a "full" data source with the data and resources loaded, you need to get the non-provisional data source through WebFrame's DataSource method. This data source will have the data after everything was loaded. Make sure that the data source was finished loading before using any of its methods. You can do this via isLoading.

4.5.2  Methods

4.5.3  Constructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new WebKitWebDataSource instance. **Notes:** The URL of the WebKitWebDataSource will be set to "about:blank". See also:

- 4.5.4 Constructor(request as LinuxWebNetworkRequestMBS)

4.5.4  Constructor(request as LinuxWebNetworkRequestMBS)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new data source with the given network request. See also:

- 4.5.3 Constructor

4.5.5  Data as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the raw data that represents the the frame's content. **Notes:** The data will be incomplete until the data has finished loading. Returns "" if the web frame hasn’t loaded any data. Use isLoading to test if data source is in the process of loading.
4.5.6 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.5.7 Encoding as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the text encoding name as set in the WebView, or if not, the text encoding of the response.

4.5.8 InitialRequest as LinuxWebNetworkRequestMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns a reference to the original request that was used to load the web content. **Notes:** The NetworkRequest returned by this method is the request prior to the "committed" load state. See Request for getting the "committed" request.

4.5.9 IsLoading as boolean

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Determines whether the data source is in the process of loading its content. **Notes:** Returns true if loading or false if not.

4.5.10 MainResource as LinuxWebResourceMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the main resource of the data source.

4.5.11 Request as LinuxWebNetworkRequestMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns a NetworkRequest that was used to create this DataSource. **Notes:** The NetworkRequest returned by this method is the request that was "committed", and hence, different from the request you get from the InitialRequest method.
4.5. **CLASS LINUXWEBDATASOURCEMBS**

4.5.12 **Subresources as LinuxWebResourceMBS()**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Gives you a list of WebKitWebResource objects that compose the WebView to which this DataSource is attached.

4.5.13 **UnreachableURI as string**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Return the unreachable URI of data_source.  
**Notes:** The data source will have an unreachable URL if it was created using WebFrame’s LoadAlternateHtmlString method.

4.5.14 **WebFrame as LinuxWebFrameMBS**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the WebFrame that represents this data source.  
**Notes:** The WebFrame is owned by WebKit and should not be freed or destroyed. This will return nil if the data_source is not attached to a frame.

4.5.15 **Properties**

4.5.16 **Handle as Integer**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.  
**Notes:** (Read and Write property)

4.5.17 **HTMLViewer as HTMLViewer**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent HTMLViewer.  
**Notes:** (Read and Write property)
4.6 class LinuxWebFrameMBS

4.6.1 class LinuxWebFrameMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The class for a WebKit WebFrame on Linux.

**Notes:** This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

4.6.2 Methods

4.6.3 Constructor

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The private constructor.

4.6.4 DataSource as LinuxWebDataSourceMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the committed data source.

4.6.5 Destructor

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.6.6 FindFrame(name as string) as LinuxWebFrameMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Searches a frame by name.

**Notes:**

For pre-defined names, returns frame if name is "_self" or "_current", returns frame’s parent frame if name is "_parent", and returns the main frame if name is "_top". Also returns frame if it is the main frame and name is either "_parent" or "_top". For other names, this function returns the first frame that matches name. This function searches frame and its descendents first, then frame’s parent and its children moving up the hierarchy until a match is found. If no match is found in frame’s hierarchy, this function will search for a matching frame in other main frame hierarchies. Returns nil if no match is found.
name: the name of the frame to be found
Returns the found WebKitWebFrame or nil in case none is found.

4.6.7 JSContext as LinuxJavaScriptContextMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Queries the javascript context for this webframe.

4.6.8 LoadAlternateString(content as string, BaseURL as string, unreachableURL as string)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Request loading of an alternate content for a URL that is unreachable.
**Notes:** Using this method will preserve the back-forward list. The URI passed in base url has to be an absolute URI.

4.6.9 LoadRequest(request as LinuxWebNetworkRequestMBS)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Connects to a given URI by initiating an asynchronous client request.
**Notes:** Creates a provisional data source that will transition to a committed data source once any data has been received. Use StopLoading to stop the load. This function is typically invoked on the main frame.

4.6.10 LoadStatus as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the current load state.

4.6.11 LoadString(content as string, MimeType as String, Encoding as String, BaseURL as string)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Requests loading of the given content with the specified MimeType, encoding and BaseURL.
**Notes:**
If mime_type is "", "text/html" is assumed.
If encoding is "", "UTF-8" is assumed.
Content: an URI string
MimeType: the MIME type, or "."
Encoding: the encoding, or "."
BaseURL: the base URI for relative locations.
See also FileExtensionToMimeTypeMBS function.

4.6.12 LoadURL(URL as string)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Requests loading of the specified URI string.

4.6.13 Name as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the frame’s name.

4.6.14 NetworkResponse as LinuxWebNetworkResponseMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the network response.
**Notes:** Returns a NetworkResponse object representing the response that was given to the request for the given frame, or nil if the frame was not created by a load. You must unref the object when you are done with it.

4.6.15 Parent as LinuxWebFrameMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the frame’s parent frame, or nil if it has none.

4.6.16 Print

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks the control to print it’s content.
4.6. CLASS LINUXWEBFRAMEMBS

4.6.17 ProvisionalDataSource as LinuxWebDataSourceMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** You use the LoadRequest method to initiate a request that creates a provisional data source. **Notes:**
The provisional data source will transition to a committed data source once any data has been received. Use DataSource to get the committed data source.

Returns the provisional WebDataSource or nil if a load request is not in progress.

4.6.18 Reload

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Reloads the initial request.

4.6.19 StopLoading

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Stops any pending loads on frame’s data source, and those of its children.

4.6.20 Title as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the frame’s document title

4.6.21 URL as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the current URI of the contents displayed by the frame.

4.6.22 Properties

4.6.23 Handle as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
4.6.24 HTMLViewer as HTMLViewer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent HTMLViewer.  
**Notes:** (Read and Write property)

4.6.25 WebView as LinuxWebViewMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent webview.  
**Notes:** (Read and Write property)

4.6.26 Constants

4.6.27 kLoadCommitted = 1

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** The first data chunk has arrived, meaning that the necessary transport requirements are established, and the load is being performed.

4.6.28 kLoadFailed = 4

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** This state means that some error occurred during the page load that prevented it from being completed. You can connect to the error event if you want to know precisely what kind of error occurred.

4.6.29 kLoadFinished = 2

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** This state means that everything that was required to display the page has been loaded.
4.6.30  \texttt{kLoadFirstVisuallyNonEmptyLayout = 3}

Plugin Version: 12.4. \textbf{Function:} One of the load state constants. \textbf{Notes:} The first layout with actual visible content happened; one or more layouts may have happened before that caused nothing to be visible on the screen, because the data available at the time was not significant enough.

4.6.31  \texttt{kLoadProvisional = 0}

Plugin Version: 12.4. \textbf{Function:} One of the load state constants. \textbf{Notes:} No data has been received yet, empty structures have been allocated to perform the load; the load may still fail for transport issues such as not being able to resolve a name, or connect to a port.
4.7 class LinuxWebHistoryItemMBS

4.7.1 class LinuxWebHistoryItemMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One item of the WebBackForwardList and or global history. **Notes:** A history item consists out of a title and a uri. It can be part of the WebBackForwardList and the global history. The global history is used for coloring the links of visited sites. WebHistoryItem’s constructed with Constructor() are automatically added to the global history.

4.7.2 Methods

4.7.3 Constructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new WebHistoryItem instance. See also:

- 4.7.4 Constructor(URI as string, Title as string)

4.7.4 Constructor(URI as string, Title as string)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new WebHistoryItem with the given URI and title. See also:

- 4.7.3 Constructor

4.7.5 Copy as LinuxWebHistoryItemMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Makes a copy of the item for use with other WebView objects.

4.7.6 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.
4.7. CLASS LINUXWEBHISTORYITEMMBS

4.7.7 LastVisitedTime as Double

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The last visited timestamp.

4.7.8 OriginalURI as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The original URL of this item.

4.7.9 Title as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The title of this item.

4.7.10 URI as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The URL of this item.

4.7.11 Properties

4.7.12 Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read and Write property)

4.7.13 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent HTMLviewer.
**Notes:** (Read and Write property)
4.7.14 AlternateTitle as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The alternate title. **Notes:** (Read and Write computed property)
4.8. CLASS LINUXWEBINSPECTORMBS

4.8 class LinuxWebInspectorMBS

4.8.1 class LinuxWebInspectorMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The WebKit Inspector is a graphical tool to inspect and change the content of a WebKitWebView. **Notes:**

It also includes an interactive JavaScriptDebugger. Using this class one can get a GtkWidget which can be embedded into an application to show the inspector.

The inspector is available when the WebKitWebSettings of the WebKitWebView has set the "enable-developer-extras" to true otherwise no inspector is available. This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

4.8.2 Methods

4.8.3 Close

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Causes the Web Inspector to be closed.

4.8.4 Constructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The private constructor.

4.8.5 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.8.6 InspectCoordinates(x as Double, y as Double)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Causes the Web Inspector to inspect the node that is located at the given coordinates of the widget. **Notes:**

The coordinates should be relative to the WebKitWebView widget, not to the scrollable content, and may be obtained from a GdkEvent directly. This means x, and y being zero doesn’t guarantee you will hit the
left-most top corner of the content, since the contents may have been scrolled.

\[x: \text{the X coordinate of the node to be inspected}\]
\[y: \text{the Y coordinate of the node to be inspected}\]

### 4.8.7 InspectedURI as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Obtains the URI that is currently being inspected.

### 4.8.8 Show

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Causes the Web Inspector to be shown.

### 4.8.9 WebView as LinuxWebViewMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Obtains the WebKitWebView that is used to render the inspector.

### 4.8.10 Properties

#### 4.8.11 Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.

**Notes:** (Read and Write property)

### 4.8.12 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent HTMLViewer.

**Notes:** (Read and Write property)
4.9. CLASS LINUXWEBNETWORKREQUESTMBS

4.9  class LinuxWebNetworkRequestMBS

4.9.1  class LinuxWebNetworkRequestMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** This class represents the network related aspects of a navigation request. **Notes:** It is used whenever WebKit wants to provide information about a request that will be sent, or has been sent. Inside it you can find the URI of the request, and, for valid URIs, a SoupMessage object, which provides access to further information such as headers.

4.9.2  Methods

4.9.3  Constructor(url as string)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new NetworkRequest initialized with an URI.

4.9.4  Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.9.5  Properties

4.9.6  Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference. **Notes:** (Read and Write property)

4.9.7  HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent HTM可以说是 Viewing. **Notes:** (Read and Write property)
4.9.8 URL as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get or set the URL for this request.

**Notes:** (Read and Write computed property)
4.10. CLASS LINUXWEBNETWORKRESPONSEMBS

4.10 class LinuxWebNetworkResponseMBS

4.10.1 class LinuxWebNetworkResponseMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** This class represents the network related aspects of a navigation response.

4.10.2 Methods

4.10.3 Constructor(url as string)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new response object with the given URL.

4.10.4 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.10.5 Properties

4.10.6 Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.

**Notes:** (Read and Write property)

4.10.7 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent HTMLViewer.

**Notes:** (Read and Write property)

4.10.8 URL as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get or set the URL for this request.
Notes: (Read and Write computed property)
4.11. CLASS LINUXWEBRESOURCEMBS

4.11 class LinuxWebResourceMBS

4.11.1 class LinuxWebResourceMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** A web resource encapsulates the data of the download as well as the URI, MIME type and frame name of the resource.

4.11.2 Methods

4.11.3 Constructor(data as string, uri as string, mimeType as string, encoding as string = "", FrameName as string = "")


**Notes:**

The encoding can be ".". The FrameName argument can be used if the resource represents contents of an entire HTML frame, otherwise pass "."

See also FileExtensionToMimeTypeMBS function.

4.11.4 Data as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the data of the webResource.

4.11.5 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.11.6 Encoding as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the encoding for this resource.
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4.11.7 FrameName as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Queries the frame name.

4.11.8 MimeType as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The MIME Type for this resource.
**Notes:** See also MimeTypeToFileExtensionMBS function.

4.11.9 URL as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The URL for this resource.

4.11.10 Properties

4.11.11 Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read and Write property)

4.11.12 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent HTMLViewer.
**Notes:** (Read and Write property)
4.12. CLASS LINUXWEBSETTINGSMBS

4.12 class LinuxWebSettingsMBS

4.12.1 class LinuxWebSettingsMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** WebSettings can be applied to a WebKitWebView to control text encoding, color, font sizes, printing mode, script support, loading of images and various other things. **Notes:** After creation, a WebSettings object contains default settings.

4.12.2 Methods

4.12.3 Constructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new WebSettings instance with default values. **Notes:** It must be manually attached to a WebView.

4.12.4 Copy as LinuxWebSettingsMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Copies an existing WebSettings instance.

4.12.5 Destructor

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.12.6 UserAgent as string

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the User-Agent string currently used by the web view(s) associated with the web_settings.
4.12.7 Properties

4.12.8 Handle as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.  
**Notes:** (Read and Write property)

4.12.9 HTMLViewer as HTMLViewer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The parent htmlviewer.  
**Notes:** (Read and Write property)
4.13. CLASS LINUXWEBVIEWMBS

4.13 class LinuxWebViewMBS

4.13.1 class LinuxWebViewMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The class for a WebKit WebView on Linux.

**Notes:**

With MBS Plugin 19.3 and Xojo 2018r2 and later, this plugin will try to load WebKit 2.0 (libwebkit2gtk-4.0.so.37) instead of WebKit 1.0 (libwebkitgtk-3.0.so).

Most functions still work for WebKit 1.x only. Let us know if you need something for WebKit 2.x.

This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

4.13.2 Methods

4.13.3 Available as Boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether the plugin found libwebkit on linux.

**Notes:** Returns true on linux if the class can work. Else it returns false.

4.13.4 BackForwardList as LinuxWebBackForwardListMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Obtains the BackForwardList associated with the given WebView.

**Notes:** The BackForwardList is owned by the WebView.

4.13.5 CanCopyClipboard as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether copy is possible.

4.13.6 CanCutClipboard as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether cut is possible.
CHAPTER 4. HTMLVIEWER LINUX

4.13.7 CanGoBack as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Determines whether web_view has a previous history item. **Notes:** Returns true if able to move back, false otherwise.

4.13.8 CanGoBackOrForward(steps as Integer) as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Determines whether web_view has a history item of steps. **Notes:**
Negative values represent steps backward while positive values represent steps forward.
steps: the number of steps
Returns true if able to move back or forward the given number of steps, false otherwise.

4.13.9 CanGoForward as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Determines whether web_view has a next history item. **Notes:** Returns true if able to move forward, false otherwise.

4.13.10 CanPasteClipboard as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether paste is possible.

4.13.11 CanRedo as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether redo is possible.

4.13.12 CanShowMimeType(MimeType as string) as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** This functions returns whether or not a MIME type can be displayed using this view. **Notes:**
4.13. CLASS LINUXWEBVIEWMBS

MimeType: a MIME type

Return boolean indicating if the MIME type can be displayed. See also FileExtensionToMimeTypeMBS function.

4.13.13 CanUndo as boolean


4.13.14 Constructor


4.13.15 CookieStore as LinuxWebCookieStoreMBS


4.13.16 CopyClipboard

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. Function: Copies the current selection inside the web_view to the clipboard.

4.13.17 CutClipboard

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. Function: Cuts the current selection inside the web_view to the clipboard.

4.13.18 DeleteSelection

4.13.19 **Destructor**

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

4.13.20 **Encoding as string**

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the default encoding of the WebKitWebView.

4.13.21 **EvaluateScript(script as string) as string**

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Evaluates a string of JavaScript.  
**Notes:**
script A string containing the script to evaluate.  
Returns the value as string that results from evaluating script, or "" if an exception is thrown.

4.13.22 **ExecuteScript(script as string)**

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Executes java script.

4.13.23 **FocusedFrame as LinuxWebFrameMBS**

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the frame that has focus or an active text selection.  
**Notes:** Returns the focused frame or nil if no frame is focused

4.13.24 **GoBack**

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Loads the previous history item.
4.13. CLASS LINUXWEBVIEWMBS

4.13.25 GoBackOrForward(steps as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Loads the history item that is the number of steps away from the current item. **Notes:** Negative values represent steps backward while positive values represent steps forward.

4.13.26 GoForward

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Loads the next history item.

4.13.27 GoToItem(item as LinuxWebHistoryItemMBS) as boolean

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Go to the specified history item. **Notes:** Returns true if loading of item is successful, false if not.

4.13.28 HasSelection as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Determines whether text was selected. **Notes:** Returns true if there is selected text, false if not.

4.13.29 IconURL as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the favorite icon URL for the current website.

4.13.30 Inspector as LinuxWebInspectorMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Obtains the WebKitWebInspector associated with the WebKitWebView. **Notes:** Every WebKitWebView object has a WebKitWebInspector object attached to it as soon as it is created, so this function will only return nil if the argument is not a valid WebKitWebView.
4.13.31  IsLoading as Boolean

Plugin Version: 19.3, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns true while web view is loading.  
**Notes:** Works for WebKit 1.x and 2.x.

4.13.32  JSContext as LinuxJavaScriptContextMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Queries the javascript context for the main webframe.

4.13.33  LoadHTMLString(HTMLString as string, BaseURL as string = "")

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Loads a HTML string.

4.13.34  LoadRequest(request as LinuxWebNetworkRequestMBS)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Requests loading of the specified asynchronous client request.  
**Notes:** Creates a provisional data source that will transition to a committed data source once any data has been received. Use StopLoading to stop the load.

4.13.35  LoadStatus as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the current load state.  
**Notes:** Works for WebKit 1.x and 2.x.

4.13.36  LoadString(content as string, MimeType as String, Encoding as String, BaseURL as string)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Requests loading of the given content with the specified MimeType, encoding and BaseURL.  
**Notes:**
4.13. **CLASS LINUXWEBVIEWMBS**

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEBKIT_LOAD_PROVISIONAL</td>
<td>0</td>
<td>No data has been received yet, empty structures have been allocated to perform the load; the load may still fail for transport issues such as not being able to resolve a name, or connect to a port.</td>
</tr>
<tr>
<td>WEBKIT_LOAD_COMMITTED</td>
<td>1</td>
<td>The first data chunk has arrived, meaning that the necessary transport requirements are established, and the load is being performed.</td>
</tr>
<tr>
<td>WEBKIT_LOAD_FINISHED</td>
<td>2</td>
<td>This state means that everything that was required to display the page has been loaded.</td>
</tr>
<tr>
<td>WEBKIT_LOAD_FIRST_VISUALLY_NON_EMPTY_LAYOUT</td>
<td>3</td>
<td>The first layout with actual visible content happened; one or more layouts may have happened before that caused nothing to be visible on the screen, because the data available at the time was not significant enough.</td>
</tr>
<tr>
<td>WEBKIT_LOAD_FAILED</td>
<td>4</td>
<td>This state means that some error occurred during the page load that prevented it from being completed. You can connect to the # WebKitWebView::load-error signal if you want to know precisely what kind of error occurred.</td>
</tr>
</tbody>
</table>

If mime_type is "", "text/html" is assumed.
If encoding is "", "UTF-8" is assumed.

Content: an URI string
MimeType: the MIME type, or "".
Encoding: the encoding, or "".
BaseURL: the base URI for relative locations.

See also FileExtensionToMimeTypeMBS function.

### 4.13.37 LoadURL(URL as string)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Requests loading of the specified URI string.

### 4.13.38 MainFrame as LinuxWebFrameMBS

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function**: Returns the main frame of the document.

### 4.13.39 MajorVersion as Integer

4.13.40  MarkTextMatches(text as string, caseSensitive as boolean = false, limit as Integer = 99) as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Attempts to highlight all occurrences of string inside webview.

**Notes:**
- string: a string to look for
- case_sensitive: whether to respect the case of text
- limit: the maximum number of strings to look for or 0 for all

Returns the number of strings highlighted.

4.13.41  MicroVersion as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns micro version of webkit.

4.13.42  MinorVersion as Integer

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns minor version of webkit.

4.13.43  PasteClipboard

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Pastes the current contents of the clipboard to the webview.

4.13.44  Progress as Double

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The global locating progress in percent.

**Notes:** 1.0 is full progress.

4.13.45  Redo

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Redos last action if possible.
4.13.46 Reload

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Reloads the initial request.

4.13.47 ReloadIgnoreCache

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Reloads the webview without using any cached data.

4.13.48 SearchText(text as string, caseSensitive as boolean = false, forward as boolean = true, wrap as boolean = true) as boolean

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Looks for a specified string inside webview.

**Notes:**

- text: a string to look for.
- case_sensitive: whether to respect the case of text.
- forward: whether to find forward or not.
- wrap: whether to continue looking at the beginning after reaching the end.

Returns true on success or false on failure.

4.13.49 SelectAll

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Attempts to select everything inside the webview.

4.13.50 SetCookieStore(newStore as LinuxWebCookieStoreMBS)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Makes the given cookie store the default one.

4.13.51 SetHighlightTextMatches(highlight as boolean)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Highlights text matches previously marked by MarkTextMatches.
4.13.52  SetMaintainsBackForwardList(flag as boolean)

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Set the view to maintain a back or forward list of history items.

4.13.53  StopLoading

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Stops any pending loads on frame’s data source, and those of its children.

4.13.54  Title as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The title of the website.

4.13.55  Undo

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Undos last action if possible.

4.13.56  UnmarkTextMatches

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Unmarks text matches from search.

4.13.57  URL as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the current URL.

4.13.58  ZoomIn

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Increases the zoom level of web_view.

**Notes:** The current zoom level is incremented by the value of the ”zoom-step” property of the settings.
4.13. CLASS LINUXWEBVIEWMBS

associated with webview.

4.13.59  ZoomOut

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Decreases the zoom level of webview.
**Notes:** The current zoom level is decremented by the value of the "zoom-step" property of the settings associated with webview.

4.13.60  Properties

4.13.61  Handle as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read and Write property)

4.13.62  HTMLViewer as HTMLViewer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent HTMLViewer.
**Notes:** (Read and Write property)

4.13.63  CacheModel as Integer

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The cache model for the htmlviewer.
**Notes:** (Read and Write computed property)

4.13.64  CustomEncoding as string

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The current WebKitWebView encoding.
**Notes:** (Read and Write computed property)
4.13.65  Editable as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes.  **Function:** Whether the user is allowed to edit the document.

**Notes:**

If flag is true, webview allows the user to edit the document. If flag is false, an element in webview’s document can only be edited if the CONTENTEDITABLE attribute has been set on the element or one of its parent elements. You can change webview’s document programmatically regardless of this setting. By default a WebKitWebView is not editable.

Normally, an HTML document is not editable unless the elements within the document are editable. This function provides a low-level way to make the contents of a WebKitWebView editable without altering the document or DOM structure.

(Read and Write computed property)

4.13.66  FullContentZoom as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes.  **Function:** Whether the zoom level affects only text or all elements.

**Notes:**

False if only text should be scaled (the default), true if the full content of the view should be scaled.

(Read and Write computed property)

4.13.67  ProxyURL as String

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes.  **Function:** The proxy URL setting.

**Notes:** (Read and Write computed property)

4.13.68  Settings as LinuxWebSettingsMBS

Plugin Version: 13.5, Console & Web: No, Mac: No, Win: No, Linux: Yes.  **Function:** The settings for this webview.

**Notes:** (Read and Write computed property)
4.13. CLASS LINUXWEBVIEWMBS

4.13.69 Transparent as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether the WebKitWebView has a transparent background.
**Notes:**
False when the WebKitWebView draws a solid background (the default), otherwise true.
(Read and Write computed property)

4.13.70 ViewSourceMode as boolean

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether we are viewing the source code.
**Notes:** (Read and Write computed property)

4.13.71 ZoomLevel as Double

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Returns the zoom level of web_view, i.e. the factor by which elements in the page are scaled with respect to their original size.
**Notes:**
If the ”full-content-zoom” property is set to false (the default) the zoom level changes the text size, or if true, scales all elements in the page.
(Read and Write computed property)

4.13.72 Constants

4.13.73 kCacheModelDocumentViewer = 1

Plugin Version: 12.4. **Function:** One of the cache model constants.
**Notes:** Cache in Document Viewer.

4.13.74 kCacheModelWebBrowser = 2

Plugin Version: 12.4. **Function:** One of the cache model constants.
**Notes:** Cache in Web Browser.
4.13.75 kLoadCommitted = 1

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** The first data chunk has arrived, meaning that the necessary transport requirements are established, and the load is being performed.

4.13.76 kLoadFailed = 4

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** This state means that some error occurred during the page load that prevented it from being completed. You can connect to the error event if you want to know precisely what kind of error occurred.

4.13.77 kLoadFinished = 2

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** This state means that everything that was required to display the page has been loaded.

4.13.78 kLoadFirstVisuallyNonEmptyLayout = 3

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** The first layout with actual visible content happened; one or more layouts may have happened before that caused nothing to be visible on the screen, because the data available at the time was not significant enough.

4.13.79 kLoadProvisional = 0

Plugin Version: 12.4. **Function:** One of the load state constants.  
**Notes:** No data has been received yet, empty structures have been allocated to perform the load; the load may still fail for transport issues such as not being able to resolve a name, or connect to a port.
Chapter 5

HTMLViewer Mac

5.1 class HTMLViewer

5.1.1 class HTMLViewer

Notes: The class itself is available on all platforms, but all the plugin methods are currently only working on Mac OS X.

5.1.2 Methods

5.1.3 LinuxWebViewMBS as LinuxWebViewMBS

Notes:
Requires a recent Xojo version (2011?). And libwekit-1.0 must be installed, so Xojo uses it for browsing.
Check Also the Available shared method on LinuxWebViewMBS class.
Chapter 6

Linux

6.1 module LinuxIconMBS

6.1.1 module LinuxIconMBS

Plugin Version: 19.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The module for linux icons.

6.1.2 Methods

6.1.3 FileIcon(file as FolderItem, size as integer = 48) as Picture


**Example:**

```vbs
dim f2 as FolderItem = SpecialFolder.Desktop
Canvas2.Backdrop = LinuxIconMBS.FileIcon(f2, Canvas2.Width)
```

**Notes:** Returns nil in case of error.

6.1.4 FilePreview(file as FolderItem, size as integer = 48) as Picture

Notes: Returns nil in case of error.

### 6.1.5 FileThumbnail(file as FolderItem) as FolderItem

Plugin Version: 19.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Queries thumbnail path for a given file.

**Example:**

```javascript
// make an image file
dim p as picture = logoMBS(500) // from Main plugin
dim f as FolderItem = SpecialFolder.Desktop.Child("MBS.jpg")
p.Save(f, p.SaveAsJPEG, 90)

// show thumbnail
dim ThumbnailFile as FolderItem = LinuxIconMBS.FileThumbnail(f)
if ThumbnailFile <> nil then
    Canvas6.Backdrop = Picture.Open(ThumbnailFile)
end if
```

Notes:

Returns nil in case of error.
Otherwise this may be URL for png file with thumbnail.

### 6.1.6 GenericIconName(MimeType as String) as String

Plugin Version: 19.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Queries generic icon name for mime type.

### 6.1.7 Icon(MimeType as String, size as integer = 48) as Picture

Plugin Version: 19.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Queries icon for mime type.

**Example:**

```javascript
Canvas1.Backdrop = LinuxIconMBS.Icon("image/jpeg", Canvas1.Width)
```

Notes: Returns nil in case of error.
6.1.8 SymbolicIcon(MimeType as String, size as integer = 48) as Picture

Plugin Version: 19.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Queries symbolic icon for given mime type. **Example:**

Canvas3.Backdrop = LinuxIconMBS.SymbolicIcon("image/jpeg", Canvas3.Width)

**Notes:** Returns nil in case of error.
6.2 class LinuxProcessMBS

6.2.1 class LinuxProcessMBS

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class for querying linux process details.

**Example:**
```
// show the path of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
MsgBox myProcess.path
```

**Notes:**
If your app has not enough permission to read info about other app, values may be missing.
This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

6.2.2 Methods

6.2.3 Constructor

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The private constructor.

6.2.4 PID as Integer

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The Process ID of the current process (your app).

**Example:**
```
dim myPID as Integer = LinuxProcessMBS.PID
MsgBox "my process ID is: "+str(myPID)
```

6.2.5 ProcessByPID(ProcessID as Integer) as LinuxProcessMBS

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Queries the information for a process with given ID.
6.2. CLASS LINUXPROCESSMBS

Example:

// show the name of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)

MsgBox myProcess.name

Notes: Returns nil on error.

6.2.6 Processes as LinuxProcessMBS()

Example:

// shows all process names in listbox
dim Processes() as LinuxProcessMBS = LinuxProcessMBS.Processes

for each p as LinuxProcessMBS in Processes
    listbox1.addrow p.name
next

6.2.7 Properties

6.2.8 CommandLine as String

Example:

// show the command line of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)

MsgBox myProcess.CommandLine

Notes: (Read only property)
6.2.9 CurrentWorkingDirectory as String

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The current working directory.

**Example:**

```lang-vb
// show the current working directory of current process
Dim myPID As Integer = LinuxProcessMBS.PID
Dim myProcess As LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
MsgBox myProcess.CurrentWorkingDirectory
```

**Notes:** (Read only property)

6.2.10 Environment as Dictionary

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The environment variables.

**Notes:** (Read only property)

6.2.11 Name as String

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The name of the process.

**Example:**

```lang-vb
// shows all process names in listbox
Dim Processes() as LinuxProcessMBS = LinuxProcessMBS.Processes
For Each p As LinuxProcessMBS In Processes
    ListBox1.AddRow p.Name
Next
```

**Notes:** (Read only property)

6.2.12 NumberOfThreads as Integer

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The number of threads used by this process.
6.2. CLASS LINUXPROCESSMBS

Notes: (Read only property)

6.2.13 OpenFiles as Dictionary


**Example**:

```vbscript
// show the paths of open files of current process in listbox
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
dim OpenFiles as Dictionary = myProcess.OpenFiles

for each key as Variant in OpenFiles.keys
    listbox1.addrow OpenFiles.Value(key).StringValue
next
```

Notes:

This dictionary contains the file descriptor number as key and the path to the file as text. (Read only property)

6.2.14 ParentProcessID as Integer

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The parent process ID.

Notes: (Read only property)

6.2.15 Path as String

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The path for this process.

**Example**:

```vbscript
// show the path of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
MsgBox myProcess.Path
```
6.2.16 ProcessID as Integer

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The process ID.
**Notes:** (Read only property)

6.2.17 StartTime as Date

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The start time of the process.
**Example:**

```
// show the start time of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
dim d as date = myProcess.StartTime
MsgBox d.LongDate + " " + d.LongTime
```

**Notes:** (Read only property)

6.2.18 State as String

Plugin Version: 14.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The state of the process.
**Notes:**

Can be Running, Sleeping, Disk Sleep, Zombie, Trace or Writing pages.
(Read only property)
6.3 class LinuxSuMBS

6.3.1 class LinuxSuMBS

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class to run stuff with sudo.

**Example:**

```plaintext
dim s as new LinuxSuMBS

s.Command = "/usr/bin/whoami"
s.User = "root"
s.Alert = "Please Root?"
s.Message "Can I install something for you?"

if s.ExecuteSudo then
    MsgBox "OK"
else
    MsgBox s.LastErrorMessage
end if
```

**Notes:** Uses the gksu library.

6.3.2 Methods

6.3.3 AskPassword(prompt as String) as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Asks for the password.

**Notes:**

Returns password.
Stores error in LastError and LastErrorMessage properties.
See also:

- 6.3.24 AskPassword(prompt as String, byref ErrorCode as Integer, byref ErrorMessage as String) as string

6.3.4 Available as boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether the gksu library was found and loaded.

**Notes:**
Should return true on linux.
If missing, install the libgksu2-0 library.

6.3.5 ExecuteRun as boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Runs the command.
**Notes:**
Returns true on success.
Stores error in LastError and LastErrorMessage properties.

6.3.6 ExecuteSu as boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Runs the command with su.
**Notes:**
Returns true on success.
Stores error in LastError and LastErrorMessage properties.

6.3.7 ExecuteSudo as boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Runs the command with sudo.
**Example:**
```dim s as new LinuxSuMBS
s.Command = "/usr/bin/whoami"
s.User = "root"
s.Alert = "Please Root?"
s.Message "Can I install something for you?"
if s.ExecuteSudo then
    MsgBox "OK"
else
    MsgBox s.LastErrorMessage
end if
```

**Notes:**
Returns true on success.
6.3. CLASS LINUXSUMBS

Stores error in LastError and LastErrorMessage properties.

6.3.8 Properties

6.3.9 Alert as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The alert message.  
**Notes:** (Read and Write property)

6.3.10 AlwaysAskPassword as Boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether to always ask for a password.  
**Notes:** (Read and Write property)

6.3.11 Command as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The command will run with the target user.  
**Notes:** (Read and Write property)

6.3.12 Debug as Boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether debugging information should be printed.  
**Notes:** (Read and Write property)

6.3.13 Description as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The description text.  
**Notes:** (Read and Write property)
6.3.14 ExitCode as Integer

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The exit code of the last command run.
**Notes:** (Read and Write property)

6.3.15 Grab as Boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Grab?
**Notes:** (Read and Write property)

6.3.16 Handle as Integer

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read and Write property)

6.3.17 KeepEnvironment as Boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Should the environment be kept as it is?
**Notes:**
Defaults to true. Notice that setting this to false may cause the X authorization stuff to fail. (Read and Write property)

6.3.18 LastError as Integer

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The last error code.
**Notes:** (Read and Write property)

6.3.19 LastErrorMessage as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The last error message.
**Notes:** (Read and Write property)
6.3.20 LoginShell as Boolean

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The shell in which the command will be run be a login shell?

**Notes:**
Finds out if the shell created by the underlying su process will be a login shell.
(Read and Write property)

6.3.21 Message as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The message text.

**Notes:** (Read and Write property)

6.3.22 User as String

Plugin Version: 16.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** What user the command will be run as.

**Notes:**
The default is root, but you can run the command as any user.
(Read and Write property)

6.3.23 Events

6.3.24 AskPassword(prompt as String, byref ErrorCode as Integer, byref ErrorMessage as String) as string

Plugin Version: 16.1, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The event to ask for password.

**Notes:**
If you prefer your own dialog.
Return password or set error parameters.
See also:

- 6.3.3 AskPassword(prompt as String) as String
6.3.25 PasswordNoNeeded

Plugin Version: 16.1, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** No password is needed.

6.3.26 Constants

6.3.27 ErrorCanceled = 11

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** The user cancelled.

6.3.28 ErrorChildFailed = 9

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Child failed.

6.3.29 ErrorExec = 5

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Execution failed.

6.3.30 ErrorFork = 4

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Forking failed.

6.3.31 ErrorHelper = 1

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** The helper tool failed.
6.3.32 ErrorNoCommand = 2

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Missing command.

6.3.33 ErrorNoPassword = 3

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Missing password.

6.3.34 ErrorNotAllowed = 10

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Not allowed.

6.3.35 ErrorPipe = 6

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Pipe failed.

6.3.36 ErrorPiperead = 7

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Pipe read error.

6.3.37 ErrorWrongAutoPass = 12

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Wrong auto Password.

6.3.38 ErrorWrongPass = 8

Plugin Version: 16.1. **Function:** One of the error codes.  
**Notes:** Wrong Password
6.3.39 ErrorXauth = 0

Plugin Version: 16.1. **Function:** One of the error codes. **Notes:** XAuth failed.
Chapter 7

Network

7.1 class AvahiBrowserMBS

7.1.1 class AvahiBrowserMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class to browse for services.

7.1.2 Methods

7.1.3 Browse(InterfaceIndex as Integer, Protocol as Integer, servicetype as string, domain as string = "", flags as Integer = 0) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Browse for services of a type on the network.

**Notes:**

In most cases you probably want to pass kInterfaceAny and kProtocolAny in InterfaceIndex, resp. protocol to browse on all local networks. The specified events will be called whenever a new service appears or is removed from the network. Please note that events may be collapsed to minimize traffic (i.e. a REMOVED followed by a NEW for the same service data is dropped because redundant). If you want to subscribe to service data changes, you should use AvahiResolverMBS class and keep it open, in which case you will be notified via Found event everytime the service data changes.

Only one browse call per AvahiBrowserMBS object please.

Returns true on success and false on failure.
7.1.4 Constructor(client as AvahiClientMBS)

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The constructor.

7.1.5 Destructor

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

7.1.6 Properties

7.1.7 Client as AvahiClientMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent client object.
**Notes:** (Read only property)

7.1.8 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.
**Notes:** (Read only property)

7.1.9 Events

7.1.10 AllForNow(type as string)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One-time event, to notify the user that more records will probably not show up in the near future, i.e. all cache entries have been read and all static servers been queried.

7.1.11 CacheExhausted(type as string)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One-time event, to notify the user that all entries from the caches have been sent.
7.1. CLASS AVAHIBROWSERMBS

7.1.12 Failure(error as string, errorcode as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Some error occurred.

7.1.13 ServiceFound(InterfaceIndex as Integer, protocol as Integer, name as string, type as string, domain as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Found a new object on the network.

7.1.14 ServiceRemoved(InterfaceIndex as Integer, protocol as Integer, name as string, type as string, domain as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The service has been removed from the network.

7.1.15 Constants

7.1.16 kInterfaceAny = -1

Plugin Version: 12.4. **Function:** Special constant to use any interface available. **Notes:** Otherwise you would pass the index of the network interface you want to use.

7.1.17 kProtocolAny = -1

Plugin Version: 12.4. **Function:** One of the IP protocol constants. **Notes:** Any protocol.

7.1.18 kProtocolIPv4 = 0

Plugin Version: 12.4. **Function:** One of the IP protocol constants. **Notes:** Only IPv4.
7.1.19  kProtocolIPv6 = 1

Plugin Version: 12.4. **Function:** One of the IP protocol constants.
**Notes:** Only IPv6.
7.2. CLASS AVAHICLIENTMBS

7.2 class AvahiClientMBS

7.2.1 class AvahiClientMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The base class for avahi.

**Notes:**
Typically you create an object of your subclass of AvahiClientMBS at application launch and keep it running. If events are too slow in GUI events, please use a timer with 50ms and call the AvahiClientMBS.Poll method there.

7.2.2 Methods

7.2.3 Available as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether the avahi library has been found and loaded.

7.2.4 Constructor(flags as Integer = 0)

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Initializes the client.

7.2.5 Destructor

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

7.2.6 DomainName as string

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Get domain name.

7.2.7 HostName as string

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Get host name.
7.2.8 Poll

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Polls for events.

**Example:**

```cpp
// in a timer with 50ms
AvahiClientMBS.Poll
```

**Notes:**

This is automatically called by the plugin for GUI applications. If you call it in a timer, you can speedup avahi.

Console applications with their own event loop need to call Poll method regularly.

7.2.9 Version as string

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Get the version of the server.

7.2.10 Properties

7.2.11 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.

**Notes:** (Read only property)

7.2.12 Events

7.2.13 Collision

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** We’re still connecting.

**Notes:** This state is only entered when kClientNoFail has been passed to Constructor() and the daemon is not yet available.
7.2. CLASS AVAHI_CLIENTMBS

7.2.14 Connecting

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Client is connecting.

7.2.15 Failure(error as string, errorcode as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Some kind of error happened on the client side.

7.2.16 Registering

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Client is registering.

7.2.17 Running

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Client is running.

7.2.18 Constants

7.2.19 kClientIgnoreUserConfig = 1

Plugin Version: 12.4. **Function:** One of the client initialization flags. **Notes:** Don’t read user configuration

7.2.20 kClientNoFail = 2

Plugin Version: 12.4. **Function:** One of the client initialization flags. **Notes:** Don’t fail if the daemon is not available when avahi_client_new() is called, instead enter AVAHI_CLIENT_CONNECTING state and wait for the daemon to appear.
7.3 class AvahiDomainBrowserMBS

7.3.1 class AvahiDomainBrowserMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class to browse for domains.

7.3.2 Methods

7.3.3 **BrowseDomains(InterfaceIndex as Integer, Protocol as Integer, domain as string = "", BrowserType as Integer = 0, flags as Integer = 0) as boolean**

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Browse for domains on the local network.
**Notes:**
Only one BrowseDomains call per AvahiDomainBrowserMBS object please. Returns true on success and false on failure.

7.3.4 **Constructor(client as AvahiClientMBS)**

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The constructor.

7.3.5 **Destructor**

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

7.3.6 **Properties**

7.3.7 **Client as AvahiClientMBS**

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent client object.
**Notes:** (Read only property)
7.3. CLASS AVAHIDOMAINBROWSERMBS

7.3.8 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.  
**Notes:** (Read only property)

7.3.9 Events

7.3.10 AllForNow

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One-time event, to notify the user that more records will probably not show up in the near future, i.e. all cache entries have been read and all static servers been queried.

7.3.11 CacheExhausted

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One-time event, to notify the user that all entries from the caches have been sent.

7.3.12 DomainFound(InterfaceIndex as Integer, protocol as Integer, domain as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Found a new domain on the network.

7.3.13 DomainRemoved(InterfaceIndex as Integer, protocol as Integer, domain as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The domain has been removed from the network.

7.3.14 Failure(error as string, errorcode as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Some error occurred.
7.3.15 Constants

7.3.16 kBrowseTypeBrowse = 0

Plugin Version: 12.4. Function: One of the browse modes for domain browsing. Notes: Browse for a list of available browsing domains.

7.3.17 kBrowseTypeBrowseDefault = 1

Plugin Version: 12.4. Function: One of the browse modes for domain browsing. Notes: Browse for the default browsing domain.

7.3.18 kBrowseTypeBrowseLegacy = 4

Plugin Version: 12.4. Function: One of the browse modes for domain browsing. Notes: Legacy browse domain - see DNS-SD spec for more information.

7.3.19 kBrowseTypeRegister = 2

Plugin Version: 12.4. Function: One of the browse modes for domain browsing. Notes: Browse for a list of available registering domains.

7.3.20 kBrowseTypeRegisterDefault = 3

Plugin Version: 12.4. Function: One of the browse modes for domain browsing. Notes: Browse for the default registering domain.

7.3.21 kInterfaceAny = -1

Plugin Version: 12.4. Function: Special constant to use any interface available. Notes: Otherwise you would pass the index of the network interface you want to use.
7.3.22  \texttt{kProtocolAny} = -1

Plugin Version: 12.4. \textbf{Function:} One of the IP protocol constants.  
\textbf{Notes:} Any protocol.

7.3.23  \texttt{kProtocolIPv4} = 0

Plugin Version: 12.4. \textbf{Function:} One of the IP protocol constants. 
\textbf{Notes:} Only IPv4.

7.3.24  \texttt{kProtocolIPv6} = 1

Plugin Version: 12.4. \textbf{Function:} One of the IP protocol constants. 
\textbf{Notes:} Only IPv6.
7.4 class AvahiResolverMBS

7.4.1 class AvahiResolverMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The class to resolve service name to IP address.

7.4.2 Methods

7.4.3 Constructor(client as AvahiClientMBS)

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The constructor.

7.4.4 Destructor

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The destructor.

7.4.5 Resolve(InterfaceIndex as Integer, Protocol as Integer, name as string, servicetype as string, domain as string, flags as Integer = 0) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: Create a new service resolver object.

**Notes:**

Please make sure to pass all the service data you received via Found event, especially interface and protocol. The protocol argument specifies the protocol (IPv4 or IPv6) to use as transport for the queries which are sent out by this resolver. The protocol argument specifies the address family (IPv4 or IPv6) of the address of the service we are looking for. Generally, on “protocol” you should only pass what was supplied to you as parameter to your Browse function. In protocol you should pass what your application code can deal with when connecting to the service. Or, more technically speaking: protocol specifies if the mDNS queries should be sent as UDP/IPv4 resp. UDP/IPv6 packets. protocol specifies whether the query is for a A resp. AAAA resource record.

Only one resolve call per AvahiResolverMBS object please. Returns true on success and false on failure.
7.4. CLASS AVAHIREsolVERMBS

7.4.6 Properties

7.4.7 Client as AvahiClientMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent client object. **Notes:** (Read only property)

7.4.8 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference. **Notes:** (Read only property)

7.4.9 Events

7.4.10 Failure(error as string, errorcode as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Some error occurred.

7.4.11 Found(interfaceIndex as Integer, Protocol as Integer, name as string, type as string, domain as string, hostname as string, port as Integer, address as string, txt as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** An address was found.

7.4.12 Constants

7.4.13 kResultCached = 1

Plugin Version: 12.4. **Function:** One of the flags for events. **Notes:** This response originates from the cache.
7.4.14 kResultLocal = 8

Plugin Version: 12.4. **Function:** One of the flags for events.
**Notes:** This record/service resides on and was announced by the local host. Only available in service and record browsers and only on Found event.

7.4.15 kResultMultiCast = 4

Plugin Version: 12.4. **Function:** One of the flags for events.
**Notes:** This response originates from multicast DNS.

7.4.16 kResultOurOwn = 16

Plugin Version: 12.4. **Function:** One of the flags for events.
**Notes:** This service belongs to the same local client as the browser object. Only available in avahi-client, and only for service browsers and only on Found event.

7.4.17 kResultStatic = 32

Plugin Version: 12.4. **Function:** One of the flags for events.
**Notes:** The returned data has been defined statically by some configuration option.

7.4.18 kResultWideArea = 2

Plugin Version: 12.4. **Function:** One of the flags for events.
**Notes:** This response originates from wide area DNS.
7.5. CLASS AVAHITYPEBROWSERMBS

7.5  class AvahiTypeBrowserMBS

7.5.1  class AvahiTypeBrowserMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class to browse for types.

7.5.2  Methods

7.5.3  BrowseTypes(InterfaceIndex as Integer, Protocol as Integer, domain as string = "", flags as Integer = 0) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Browse for service types on the local network.
**Notes:**
Only one BrowseTypes call per AvahiTypeBrowserMBS object please.
Returns true on success and false on failure.

7.5.4  Constructor(client as AvahiClientMBS)

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The constructor.

7.5.5  Destructor

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The destructor.

7.5.6  Properties

7.5.7  Client as AvahiClientMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The reference to the parent client object.
**Notes:** (Read only property)
7.5.8 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal object reference.

**Notes:** (Read only property)

7.5.9 Events

7.5.10 AllForNow

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One-time event, to notify the user that more records will probably not show up in the near future, i.e. all cache entries have been read and all static servers been queried.

7.5.11 CacheExhausted

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** One-time event, to notify the user that all entries from the caches have been sent.

7.5.12 Failure(error as string, errorcode as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Some error occurred.

7.5.13 TypeFound(InterfaceIndex as Integer, protocol as Integer, type as string, domain as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Found a new type on the network.

7.5.14 TypeRemoved(InterfaceIndex as Integer, protocol as Integer, type as string, domain as string, flags as Integer)

Plugin Version: 12.4, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The type has been removed from the network.
7.5.15 Constants

7.5.16 kInterfaceAny = -1

Plugin Version: 12.4. **Function:** Special constant to use any interface available. **Notes:** Otherwise you would pass the index of the network interface you want to use.

7.5.17 kProtocolAny = -1

Plugin Version: 12.4. **Function:** One of the IP protocol constants. **Notes:** Any protocol.

7.5.18 kProtocolIPv4 = 0

Plugin Version: 12.4. **Function:** One of the IP protocol constants. **Notes:** Only IPv4.

7.5.19 kProtocolIPv6 = 1

Plugin Version: 12.4. **Function:** One of the IP protocol constants. **Notes:** Only IPv6.
Chapter 8

RaspberryPiCamera

8.1 class RaspberryPiCameraFormatDescriptionMBS

8.1.1 class RaspberryPiCameraFormatDescriptionMBS

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class for a format description.
**Notes:** This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

8.1.2 Methods

8.1.3 Constructor

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The private constructor.

8.1.4 Properties

8.1.5 Description as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The format description.
**Notes:** (Read only property)
8.1.6 Flags as Integer


**Notes**:
Currently can be 1 for compressed and 2 for emulated.
(Read only property)

8.1.7 Index as Integer


**Notes**: (Read only property)

8.1.8 Pixelformat as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The pixel format.

**Notes**: (Read only property)

8.1.9 PixelformatString as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: The pixel format as text.

**Notes**: (Read only property)

8.1.10 Type as Integer


**Notes**:
Usually 1 for video capture.
(Read only property)
8.2 class RaspberryPiCameraFormatMBS

8.2.1 class RaspberryPiCameraFormatMBS

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class for format settings.  
**Notes:** This is an abstract class. You can’t create an instance, but you can get one from various plugin functions.

8.2.2 Methods

8.2.3 Constructor

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The private constructor.

8.2.4 Properties

8.2.5 BytesPerRow as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The number of bytes per row.  
**Notes:**  
For padding, zero if unused.  
(Read and Write property)

8.2.6 ColorSpace as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The colorspace.  
**Example:**

```cpp
// ITU-R 601 – broadcast NTSC/PAL  
const V4L2_COLORSPACE_SMPTE170M = 1

// 1125-Line (US) HDTV  
const V4L2_COLORSPACE_SMPTE240M = 2

// HD and modern captures.  
const V4L2_COLORSPACE_REC709 = 3
```
// broken BT878 extents (601, luma range 16-253 instead of 16-235)
const V4L2_COLORSPACE_BT878 = 4

// These should be useful. Assume 601 extents.
const V4L2_COLORSPACE_470_SYSTEM_M = 5
const V4L2_COLORSPACE_470_SYSTEM_BG = 6

// I know there will be cameras that send this. So, this is
// unspecified chromaticities and full 0-255 on each of the
// Y’CbCr components
const V4L2_COLORSPACE_JPEG = 7

// For RGB colourspaces, this is probably a good start.
const V4L2_COLORSPACE_SRGB = 8

Notes:
Normally zero for default.
(Read and Write property)

8.2.7 Field as Integer

Example:

const V4L2_FIELD_ANY = 0
// driver can choose from none, top, bottom, interlaced
// depending on whatever it thinks is approximate ...
const V4L2_FIELD_NONE = 1
// this device has no fields ...
const V4L2_FIELD_TOP = 2
// top field only
const V4L2_FIELD_BOTTOM = 3
// bottom field only
const V4L2_FIELD_INTERLACED = 4
// both fields interlaced
const V4L2_FIELD_SEQ_TB = 5
// both fields sequential into one
// buffer, top-bottom order
const V4L2_FIELD_SEQ_BT = 6
// same as above + bottom-top order
const V4L2_FIELD_ALTERNATE = 7
// both fields alternating into separate buffers
const V4L2_FIELD_INTERLACED_TB = 8
// both fields interlaced, top field
8.2. CLASS RASPBERRYPICAMERAFORMATMBS

// first and the top field is transmitted first
const V4L2_FIELD_INTERLACED_BT = 9
// both fields interlaced, top field
// first and the bottom field is transmitted first

Notes: (Read and Write property)

8.2.8 Height as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The height of image in pixels. Notes: (Read and Write property)

8.2.9 Pixelformat as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The pixel format. Notes: (Read and Write property)

8.2.10 PixelformatString as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The pixel format as text. Notes: (Read only property)

8.2.11 SizeImage as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The size of image. Notes: (Read and Write property)

8.2.12 Type as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The type of data stream. Notes:
With plugin we always use 1 for video capture (V4L2_BUF_TYPE_VIDEO_CAPTURE).
(Read and Write property)

8.2.13 Width as Integer

Notes: (Read and Write property)
8.3  class RaspberryPiCameraMBS

8.3.1  class RaspberryPiCameraMBS

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class to get pictures from Raspberry Pi camera and similar Linux cameras.

8.3.2  Methods

8.3.3  AvailableFormats as RaspberryPiCameraFormatDescriptionMBS()

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Queries available formats.

**Notes:**
- Lasterror and ErrorMessage are set.
- Can return nil in case of error.

8.3.4  Capture(WithPicture as boolean = true) as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Captures a new picture.

**Notes:**
- If WithPicture is true and pixel format is compatible (RGB 24 or 32bit), we set the picture property.
- If capturing JPEG, we copy the JPEG data into the JPEG property.

- Returns true on success.
- Lasterror and ErrorMessage are set.

8.3.5  Close

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Closes camera device.

**Notes:** Lasterror and ErrorMessage are set.
8.3.6 Constructor

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The constructor.

8.3.7 CurrentFormat as RaspberryPiCameraFormatMBS

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Queries current format. **Notes:**

Returns nil in case of error. Lasterror and ErrorMessage are set.

8.3.8 InitBuffer as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Initializes buffer. **Notes:**

This is done automatically if you capture.

Returns true on success. Lasterror and ErrorMessage are set.

8.3.9 Open(Device as string = ”/dev/video0”) as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Opens the camera device. **Notes:**

You need

- a Raspberry Pi computer
- to attach the camera module
- to enable the video camera
- run a command: sudo modprobe bcm2835-v4l2
- to check if you see /dev/video0 in file system.
8.3. CLASS RASPBERRYPICAMERAMBS

Returns true on success.
Lasterror and ErrorMessage are set.

8.3.10 SetCurrentFormat(format as RaspberryPiCameraFormatMBS) as boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sets current format. **Notes:**
This allows to use any format, even if we can’t transform it to picture for you.

Returns true on success.
Lasterror and ErrorMessage are set.

8.3.11 SetJPEGSize(Width as Integer, Height as Integer) as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sets size and format to capture. **Notes:**
Sets JPEG format with given size.

Returns true on success.
Lasterror and ErrorMessage are set.

8.3.12 SetSize(Width as Integer, Height as Integer) as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sets size and format to capture. **Notes:**
Sets to capture RGB picture with given size.

Returns true on success.
Lasterror and ErrorMessage are set.
8.3.13 Properties

8.3.14 AutoExposureBias as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
Lasterror is set.
e.g. 12.
(Read and Write property)

8.3.15 AutoFocusRange as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
See kAutoFocusRange* constants
(Read and Write property)

8.3.16 AutoFocusStart as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
Lasterror is set.
(Read and Write property)

8.3.17 AutoFocusStatus as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
See kAutoFocusStatus* constants
(Read and Write property)
8.3. CLASS RASPBERRYPICAMERAMBS

8.3.18 AutoFocusStop as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
Lasterror is set.
(Read and Write property)

8.3.19 AutoNPresetWhiteBalance as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
See kWhiteBalance* constants.
e.g. value is 1 for kWhiteBalanceAuto.
(Read and Write property)

8.3.20 Buffer as Ptr

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The pointer to the buffer.

**Notes:**
For the case you want to convert yourself pixel values to a picture.
(Read only property)

8.3.21 BufferLength as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The length of the buffer.

**Notes:** (Read only property)

8.3.22 BusInfo as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The device bus info.

**Notes:**
e.g. "PCI:test"
(Read only property)
8.3.23 BytesPerRow as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The bytes per row for current image. Notes: (Read only property)

8.3.24 CanCapture as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: Whether the device can capture video. Notes: This is queried by checking if bitwiseAnd(capabilities,1) = 1. (Read only property)

8.3.25 Capabilities as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: Device capabilities bitmap. Notes: (Read only property)

8.3.26 Card as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The name of the card. Notes: e.g. "Hauppauge WinTV" (Read only property)

8.3.27 Driver as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. Function: The name of the driver. Notes: e.g. "bttv" (Read only property)
8.3.28 ErrorMessage as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The error message for lasterror property.

**Notes:** (Read only property)

8.3.29 ExposureAbsolute as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**

Lasterror is set.
e.g. 1000
(Read and Write property)

8.3.30 ExposureAuto as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**

See kExposure* constants.
Value is e.g. 0 for kExposureAuto.
(Read and Write property)

8.3.31 ExposureAutoPriority as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**

Lasterror is set.
(Read and Write property)
8.3.32 ExposureMetering as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
- See kExposureMetering* constants
- (Read and Write property)

8.3.33 FocusAbsolute as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
- Lasterror is set.
- May not work if you don’t have a controllable focus on the camera.
- (Read and Write property)

8.3.34 FocusAuto as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
- Lasterror is set.
- May not work if you don’t have a controllable focus on the camera.
- (Read and Write property)

8.3.35 FocusRelative as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
- Lasterror is set.
- May not work if you don’t have a controllable focus on the camera.
- (Read and Write property)
8.3.36 Handle as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The internal file handle.  
**Notes:** (Read only property)

8.3.37 Height as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The height in pixel used for capture.  
**Notes:** (Read only property)

8.3.38 ImageStabilization as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.  
**Notes:**  
Lasterror is set.  
(Read and Write property)

8.3.39 IrisAbsolute as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.  
**Notes:**  
Lasterror is set.  
May not work if you don’t have a controllable iris on the camera.  
(Read and Write property)

8.3.40 IrisRelative as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.  
**Notes:**  
Lasterror is set.  
May not work if you don’t have a controllable iris on the camera.  
(Read and Write property)
8.3.41 IsoSensitivity as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.
**Notes:**
Last error is set.
(Read and Write property)

8.3.42 IsoSensitivityAuto as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.
**Notes:**
See kISOSensitivity* constants.
Usually set to kISOSensitivityAuto for auto mode (1).
(Read and Write property)

8.3.43 JPEG as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The last JPEG image data block.
**Notes:** (Read only property)

8.3.44 LastError as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The last error code.
**Notes:** (Read only property)

8.3.45 Lock3A as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.
**Notes:**
See kLock* constants.
(Read and Write property)
8.3. CLASS RASPBERRYPICAMERAMBS

8.3.46 Opened as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether device is opened. **Notes:** (Read only property)

8.3.47 PanAbsolute as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires. **Notes:**
Lasterror is set.
(Read and Write property)

8.3.48 PanRelative as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires. **Notes:**
Lasterror is set.
(Read and Write property)

8.3.49 PanReset as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires. **Notes:**
Lasterror is set.
(Read and Write property)

8.3.50 PanSpeed as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires. **Notes:**
Lasterror is set.
(Read and Write property)
8.3.51 Picture as Picture

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The last captured picture.
**Notes:** (Read only property)

8.3.52 PixelFormat as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The pixel format.
**Notes:** (Read only property)

8.3.53 PixelformatString as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The pixel format as text.
**Notes:** (Read only property)

8.3.54 Privacy as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.
**Notes:**
Lasterror is set.
(Read and Write property)

8.3.55 Recording as Boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether we are recording currently.
**Notes:** (Read only property)
8.3.56 SceneMode as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
See kSceneMode* constants
(Read and Write property)

8.3.57 TiltAbsolute as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
Lasterror is set.
(Read and Write property)

8.3.58 TiltRelative as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
Lasterror is set.
(Read and Write property)

8.3.59 TiltReset as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
Lasterror is set.
(Read and Write property)

8.3.60 TiltSpeed as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.

**Notes:**
CHAPTER 8. RASPBERRYPICAMERA

Lasterror is set. (Read and Write property)

8.3.61  Version as String

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The version of the driver.  
**Notes:** (Read only property)

8.3.62  WideDynamicRange as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires.  
**Notes:**

Lasterror is set. (Read and Write property)

8.3.63  Width as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The width in pixel used for capture.  
**Notes:** (Read only property)

8.3.64  ZoomAbsolute as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires.  
**Notes:**

Lasterror is set. (Read and Write property)

8.3.65  ZoomContinuous as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration propertires.  
**Notes:**
8.3. CLASS RASPBERRYPICAMERAMBS

Lasterror is set.
(Read and Write property)

8.3.66  ZoomRelative as Integer

Plugin Version: 18.0, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** One of the camera configuration properties.  
**Notes:**
Lasterror is set.
(Read and Write property)

8.3.67  Constants

8.3.68  kAutoFocusRangeAuto = 0

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusRange property.

8.3.69  kAutoFocusRangeInfinity = 3

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusRange property.

8.3.70  kAutoFocusRangeMacro = 2

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusRange property.

8.3.71  kAutoFocusRangeNormal = 1

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusRange property.

8.3.72  kAutoFocusStatusBusy = 1

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusStatus property.
8.3.73  kAutoFocusStatusFailed = 4

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusStatus property.

8.3.74  kAutoFocusStatusIdle = 0

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusStatus property.

8.3.75  kAutoFocusStatusReached = 2

Plugin Version: 18.0. **Function:** One of the constants for AutoFocusStatus property.

8.3.76  kExposureAperturePriority = 3

Plugin Version: 18.0. **Function:** One of the constants for ExposureAuto property.

8.3.77  kExposureAuto = 0

Plugin Version: 18.0. **Function:** One of the constants for ExposureAuto property.

8.3.78  kExposureManual = 1

Plugin Version: 18.0. **Function:** One of the constants for ExposureAuto property.

8.3.79  kExposureMeteringAverage = 0

Plugin Version: 18.0. **Function:** One of the constants for ExposureMetering property.

8.3.80  kExposureMeteringCenterWeighted = 1

Plugin Version: 18.0. **Function:** One of the constants for ExposureMetering property.
8.3. CLASS RASPBERRYPICAMERAMBS

8.3.81 kExposureMeteringMatrix = 3

Plugin Version: 18.0. **Function:** One of the constants for ExposureMetering property.

8.3.82 kExposureMeteringSpot = 2

Plugin Version: 18.0. **Function:** One of the constants for ExposureMetering property.

8.3.83 kExposureShutterPriority = 2

Plugin Version: 18.0. **Function:** One of the constants for ExposureAuto property.

8.3.84 kISOSensitivityAuto = 1

Plugin Version: 18.0. **Function:** One of the constants for IsoSensitivityAuto property.

8.3.85 kISOSensitivityManual = 0

Plugin Version: 18.0. **Function:** One of the constants for IsoSensitivityAuto property.

8.3.86 kLockExposure = 1

Plugin Version: 18.0. **Function:** One of the constants for Lock3A property.

8.3.87 kLockFocus = 4

Plugin Version: 18.0. **Function:** One of the constants for Lock3A property.

8.3.88 kLockWhiteBalance = 2

Plugin Version: 18.0. **Function:** One of the constants for Lock3A property.
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8.3.89  kSceneModeBacklight = 1

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.90  kSceneModeBeachSnow = 2

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.91  kSceneModeCandleLight = 3

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.92  kSceneModeDawnDusk = 4

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.93  kSceneModeFallColors = 5

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.94  kSceneModeFireworks = 6

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.95  kSceneModeLandscape = 7

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.96  kSceneModeNight = 8

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.
8.3.97 kSceneModeNone = 0

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.98 kSceneModePartyIndoor = 9

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.99 kSceneModePortrait = 10

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.100 kSceneModeSports = 11

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.101 kSceneModeSunset = 12

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.102 kSceneModeText = 13

Plugin Version: 18.0. **Function:** One of the constants for ScreenMode property.

8.3.103 kWhiteBalanceAuto = 1

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.104 kWhiteBalanceCloudy = 8

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.
8.3.105   kWhiteBalanceDaylight = 6

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.106   kWhiteBalanceFlash = 7

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.107   kWhiteBalanceFluorescent = 3

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.108   kWhiteBalanceFluorescentH = 4

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.109   kWhiteBalanceHorizon = 5

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.110   kWhiteBalanceIncandescent = 2

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.111   kWhiteBalanceManual = 0

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.

8.3.112   kWhiteBalanceShade = 9

Plugin Version: 18.0. **Function:** One of the constants for AutoNPresetWhiteBalance property.
Chapter 9

System

9.1  class LinuxSysInfoMBS

9.1.1  class LinuxSysInfoMBS

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The class to query memory and processor statistics.

**Example:**

```vbnet
dim l as new LinuxSysInfoMBS
MsgBox str(l.FreeRam)+" bytes free."
```

9.1.2  Methods

9.1.3  Constructor

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Queries values and fills properties.

9.1.4  loads(index as Integer) as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** 1, 5, and 15 minute load averages.
9.1.5 Properties

9.1.6 availablePhysicalPages as Integer

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Return number of available physical pages of memory in the system. **Notes:** (Read only property)

9.1.7 BufferRam as UInt64

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Memory used by buffers. **Notes:** (Read only property)

9.1.8 FreeHigh as UInt64

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Available high memory size. **Notes:** (Read only property)

9.1.9 FreeRam as UInt64

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Available memory size. **Example:**
dim l as new LinuxSysInfoMBS

MsgBox str(l.FreeRam) + " bytes free."

**Notes:** (Read only property)

9.1.10 FreeSwap as UInt64

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Swap space still available. **Notes:** (Read only property)
9.1. CLASS LINUXSYSINFOMBS

9.1.11 MemoryUnit as UInt64

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Memory unit size in bytes.  
**Notes:** (Read only property)

9.1.12 NumberOfProcesses as Integer

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Number of current processes.  
**Example:**

```vbscript
dim l as new LinuxSysInfoMBS
MsgBox str(l.NumberOfProcesses) + " processes"
```

**Notes:** (Read only property)

9.1.13 NumberOfProcessors as Integer

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Return number of available processors.  
**Example:**

```vbscript
dim l as new LinuxSysInfoMBS
MsgBox str(l.NumberOfProcessors) + " processors"
```

**Notes:** (Read only property)

9.1.14 NumberOfProcessorsConfigured as Integer

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Return number of configured processors.  
**Notes:** (Read only property)
9.1.15  **PhysicalPages as Integer**

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Return number of physical pages of memory in the system.  
**Notes:** (Read only property)

9.1.16  **SharedRam as UInt64**

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Amount of shared memory.  
**Notes:** (Read only property)

9.1.17  **TotalHigh as UInt64**

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Total high memory size.  
**Notes:** (Read only property)

9.1.18  **TotalRam as UInt64**

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Total usable main memory size.  
**Notes:** (Read only property)

9.1.19  **TotalSwap as UInt64**

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Total swap space size.  
**Notes:** (Read only property)

9.1.20  **upTime as Integer**

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Seconds since boot.  
**Notes:** (Read only property)
9.1. CLASS LINUXSYSINFOMBS

9.1.21 Valid as Boolean

Plugin Version: 12.1, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Whether constructor got values.

**Notes:**

Should be true on Linux and false on other platforms.

*(Read only property)*
Chapter 10

Window

10.1 class GTKWindowMBS

10.1.1 class GTKWindowMBS

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The class to control a GTKWindow.

**Notes:**

We can directly modify a window on Linux using this class.

If you need methods to do something special, please do not hesitate to email us.

10.1.2 Methods

10.1.3 Constructor(win as window)

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Creates a new GTKWindow object pointing to a given window.

**Notes:** Raises exception on Mac/Win to prevent you from creating invalid object.

10.1.4 Deiconify

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to deiconify (i.e. unminimize) the specified window.

**Notes:** Note that you shouldn’t assume the window is definitely deiconified afterward, because other entities (e.g. the user or window manager) could iconify it again before your code which assumes deiconification gets to run.
10.1.5 Fullscreen

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to place window in the fullscreen state.

**Notes:** Note that you shouldn’t assume the window is definitely full screen afterward, because other entities (e.g. the user or window manager) could unfullscreen it again, and not all window managers honor requests to fullscreen windows. But normally the window will end up fullscreen. Just don’t write code that crashes if not.

10.1.6 Iconify

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to iconify (i.e. minimize) the specified window.

**Notes:**

Note that you shouldn’t assume the window is definitely iconified afterward, because other entities (e.g. the user or window manager) could deiconify it again, or there may not be a window manager in which case iconification isn’t possible, etc. But normally the window will end up iconified. Just don’t write code that crashes if not.

It’s permitted to call this function before showing a window, in which case the window will be iconified before it ever appears onscreen.

10.1.7 IsComposited as Boolean

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Whether this window can rely on having its alpha channel drawn correctly.

**Notes:** On X11 this function returns whether a compositing manager is running for window’s screen.

10.1.8 Maximize

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to maximize window, so that it becomes full-screen.

**Notes:**

Note that you shouldn’t assume the window is definitely maximized afterward, because other entities (e.g. the user or window manager) could unmaximize it again, and not all window managers support maximization. But normally the window will end up maximized. Just don’t write code that crashes if not.
It’s permitted to call this function before showing a window, in which case the window will be maximized when it appears onscreen initially.

### 10.1.9 SetIcon(pic as picture)

**Plugin Version:** 14.0, **Console & Web:** No, **Mac:** No, **Win:** No, **Linux:** Yes. **Function:** Assigns an icon to the picture.

**Notes:**
The operation system will scale the picture to required size, so please use bigger images. Please use picture with alpha channel for best result.

### 10.1.10 SetKeepAbove(setting as boolean)

**Plugin Version:** 13.0, **Console & Web:** No, **Mac:** No, **Win:** No, **Linux:** Yes. **Function:** Asks to keep window above, so that it stays on top.

**Notes:**
Note that you shouldn’t assume the window is definitely above afterward, because other entities (e.g. the user or window manager) could not keep it above, and not all window managers support keeping windows above. But normally the window will end kept above. Just don’t write code that crashes if not.

It’s permitted to call this function before showing a window, in which case the window will be kept above when it appears onscreen initially.

Note that, according to the Extended Window Manager Hints specification, the above state is mainly meant for user preferences and should not be used by applications e.g. for drawing attention to their dialogs.

### 10.1.11 SetKeepBelow(setting as boolean)

**Plugin Version:** 13.0, **Console & Web:** No, **Mac:** No, **Win:** No, **Linux:** Yes. **Function:** Asks to keep window below, so that it stays in bottom.

**Notes:**
Note that you shouldn’t assume the window is definitely below afterward, because other entities (e.g. the user or window manager) could not keep it below, and not all window managers support putting windows below. But normally the window will be kept below. Just don’t write code that crashes if not.

It’s permitted to call this function before showing a window, in which case the window will be kept below when it appears onscreen initially.
Note that, according to the Extended Window Manager Hints specification, the above state is mainly meant for user preferences and should not be used by applications e.g. for drawing attention to their dialogs.

10.1.12 Stick

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to stick window, which means that it will appear on all user desktops.

**Notes:**

Note that you shouldn’t assume the window is definitely stuck afterward, because other entities (e.g. the user or window manager) could unstick it again, and some window managers do not support sticking windows. But normally the window will end up stuck. Just don’t write code that crashes if not.

It’s permitted to call this function before showing a window.

10.1.13 Unfullscreen

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to toggle off the fullscreen state for window.

**Notes:** Note that you shouldn’t assume the window is definitely not full screen afterward, because other entities (e.g. the user or window manager) could fullscreen it again, and not all window managers honor requests to unfullscreen windows. But normally the window will end up restored to its normal state. Just don’t write code that crashes if not.

10.1.14 Unmaximize

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to unmaximize window.

**Notes:** Note that you shouldn’t assume the window is definitely unmaximized afterward, because other entities (e.g. the user or window manager) could maximize it again, and not all window managers honor requests to unmaximize. But normally the window will end up unmaximized. Just don’t write code that crashes if not.

10.1.15 Unstick

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Asks to unstick window, which means that it will appear on only one of the user’s desktops.

**Notes:** Note that you shouldn’t assume the window is definitely unstuck afterward, because other entities (e.g. the user or window manager) could stick it again. But normally the window will end up stuck. Just don’t write code that crashes if not.
10.1.16 Properties

10.1.17 Handle as Integer

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** The internal window handle. 
**Notes:** (Read and Write property)

10.1.18 AcceptFocus as Boolean

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get/Set whether window should receive focus. 
**Notes:** 
Windows may set a hint asking the desktop environment not to receive the input focus. This function sets this hint. 
(Read and Write computed property)

10.1.19 Opacity as Double

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get or set the Opacity of this window. 
**Notes:** 
Request the windowing system to make window partially transparent, with opacity 0 being fully transparent and 1 fully opaque. (Values of the opacity parameter are clamped to the \([0,1]\) range.) On X11 this has any effect only on X screens with a compositing manager running. See isComposited. 
(Read and Write computed property)

10.1.20 Resizable as Boolean

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get or set whether the user can resize a window. 
**Notes:** (Read and Write computed property)

10.1.21 Title as string

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Get or set the window title. 
**Notes:**
The title of a window will be displayed in its title bar; on the X Window System, the title bar is rendered by the window manager, so exactly how the title appears to users may vary according to a user’s exact configuration. The title should help a user distinguish this window from other windows they may have open. A good title might include the application name and current document filename, for example.
(Read and Write computed property)
10.2. CLASS WINDOW

10.2 class Window

10.2.1 class Window

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Extends Xojo’s Window Class.

**Example:**

window1.HasNoTitleBarMBS = true

**Notes:** In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

10.2.2 Methods

10.2.3 GTKWindow as GTKWindowMBS

Plugin Version: 13.0, Console & Web: No, Mac: No, Win: No, Linux: Yes. **Function:** Queries a GTKWindow object for this window.

**Notes:**

Returns only a valid object on linux.
On other platforms, this function returns nil.
Chapter 11

WiringPi

11.1 module WiringPiMBS

11.1.1 module WiringPiMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The module to work with wiring pi library.

11.1.2 Methods

11.1.3 analogRead(pin as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This returns the value read on the supplied analog input pin.
**Notes:** You will need to register additional analog modules to enable this function for devices such as the Gertboard, quick2Wire analog board, etc.

11.1.4 analogWrite(pin as Integer, value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This writes the given value to the supplied analog pin.
**Notes:** You will need to register additional analog modules to enable this function for devices such as the Gertboard.
11.1.5 delay(HowLong as UInt32)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This causes program execution to pause for at least howLong milliseconds.

**Notes:** Due to the multi-tasking nature of Linux it could be longer. Note that the maximum delay is an unsigned 32-bit integer or approximately 49 days.

11.1.6 delayMicroseconds(HowLong as UInt32)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This causes program execution to pause for at least howLong microseconds.

**Notes:**

Due to the multi-tasking nature of Linux it could be longer. Note that the maximum delay is an unsigned 32-bit integer microseconds or approximately 71 minutes.

Delays under 100 microseconds are timed using a hard-coded loop continually polling the system time, Delays over 100 microseconds are done using the system nanosleep() function – You may need to consider the implications of very short delays on the overall performance of the system, especially if using threads.

11.1.7 digitalRead(pin as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This function returns the value read at the given pin.

**Notes:** It will be kHIGH or kLOW (1 or 0) depending on the logic level at the pin.

11.1.8 digitalWrite(pin as Integer, value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Writes the value kHIGH or kLOW (1 or 0) to the given pin which must have been previously set as an output.

**Notes:** WiringPi treats any non-zero number as kHIGH, however 0 is the only representation of kLOW.

11.1.9 digitalWriteByte(value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This writes the 8-bit byte supplied to the first 8 GPIO pins.

**Notes:** It’s the fastest way to set all 8 bits at once to a particular value, although it still takes two write operations to the Pi’s GPIO hardware.
11.1.10  gpioClockSet(pin as Integer, value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sets the clock.

11.1.11  I2CRead(fd as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Simple device read.  
**Notes:**
Some devices present data when you read them without having to do any register transactions.  
If the return value is negative then an error has happened and you should consult errno.

11.1.12  I2CReadReg16(fd as Integer, reg as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Simple device read.  
**Notes:**
Some devices present data when you read them without having to do any register transactions.  
Read a 16-bit value from the device register indicated.  
If the return value is negative then an error has happened and you should consult errno.

11.1.13  I2CReadReg8(fd as Integer, reg as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Simple device read.  
**Notes:**
Some devices present data when you read them without having to do any register transactions.  
Read an 8-bit value from the device register indicated.  
If the return value is negative then an error has happened and you should consult errno.

11.1.14  I2CSetup(devId as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This initialises the I2C system with your given device identifier.  
**Notes:**
The ID is the I2C number of the device and you can use the i2cdetect program to find this out. I2CSetup() will work out which revision Raspberry Pi you have and open the appropriate device in /dev.
The return value is the standard Linux filehandle, or -1 if any error – in which case, you can consult errno as usual.

E.g. the popular MCP23017 GPIO expander is usually device Id 0x20, so this is the number you would pass into wiringPiI2CSetup().

### 11.1.15 I2CSetupInterface(device as string, devId as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This initialises the I2C system with your given device identifier and name.

### 11.1.16 I2CWrite(fd as Integer, Data as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Simple device write. **Notes:**

Some devices accept data this way without needing to access any internal registers.

If the return value is negative then an error has happened and you should consult errno.

### 11.1.17 I2CWriteReg16(fd as Integer, reg as Integer, Data as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Simple device write. **Notes:**

Some devices accept data this way without needing to access any internal registers.

Write a 16-bit data value into the device register indicated.

If the return value is negative then an error has happened and you should consult errno.

### 11.1.18 I2CWriteReg8(fd as Integer, reg as Integer, Data as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Simple device write. **Notes:**

Some devices accept data this way without needing to access any internal registers.

Write a 8-bit data value into the device register indicated.
If the return value is negative then an error has happened and you should consult errno.

11.1.19  LoadLibrary(File as FolderItem) as boolean

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Loads the library.

**Notes:**
Returns true on success or false on failure.
LoadError is set in case of failure.
See also:
- 11.1.20 LoadLibrary(Path as string) as boolean

11.1.20 LoadLibrary(Path as string) as boolean

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Loads the library.

**Notes:**
Returns true on success or false on failure.
LoadError is set in case of failure.
See also:
- 11.1.19 LoadLibrary(File as FolderItem) as boolean

11.1.21  micros as UInt32

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This returns a number representing the number of microseconds since your program called one of the wiringPiSetup functions.

**Notes:** It returns an unsigned 32-bit number which wraps after approximately 71 minutes.

11.1.22  millis as UInt32

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This returns a number representing the number of milliseconds since your program called one of the wiringPiSetup functions.

**Notes:** It returns an unsigned 32-bit number which wraps after 49 days.

11.1.23  physPinToGpio(physPin as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This returns the BCM_GPIO pin number of the supplied physical pin on the P1 connector.
11.1.24  piBoardId(byref model as Integer, byref Rev as Integer, byref Mem as Integer, byref Maker as Integer, byref OverVolted as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Queries board identifiers.
**Notes:**
Mem is memory in Megabytes.
Maker, Model and Rev are value which match the constants in this module.

11.1.25  piBoardRev as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This returns the board revision of the Raspberry Pi.
**Notes:** It will be either 1 or 2. Some of the BCM_GPIO pins changed number and function when moving from board revision 1 to 2, so if you are using BCM_GPIO pin numbers, then you need to be aware of the differences.

11.1.26  piHiPri(pri as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This attempts to shift your program (or thread in a multi-threaded program) to a higher priority and enables a real-time scheduling.
**Notes:**
The priority parameter should be from 0 (the default) to 99 (the maximum). This won’t make your program go any faster, but it will give it a bigger slice of time when other programs are running. The priority parameter works relative to others – so you can make one program priority 1 and another priority 2 and it will have the same effect as setting one to 10 and the other to 90 (as long as no other programs are running with elevated priorities)

The return value is 0 for success and -1 for error. If an error is returned, the program should then consult the errno global variable, as per the usual conventions.

**Note:** Only programs running as root can change their priority. If called from a non-root program then nothing happens.

11.1.27  piLock(Key as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Locks a synchronization lock.
11.1. MODULE WIRINGPIMBS

Notes:

These allow you to synchronise variable updates from your main program to any threads running in your program. keyNum is a number from 0 to 3 and represents a “key”. When another process tries to lock the same key, it will be stalled until the first process has unlocked the same key.

You may need to use these functions to ensure that you get valid data when exchanging data between your main program and a thread – otherwise it’s possible that the thread could wake-up halfway during your data copy and change the data – so the data you end up copying is incomplete, or invalid.

11.1.28 piMakerNames(index as Integer) as string

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: Maps maker numbers to names.

11.1.29 piModelNames(index as Integer) as string

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: Maps model numbers to names.

11.1.30 pinMode(pin as Integer, mode as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: This sets the mode of a pin to either INPUT, OUTPUT, PWM_OUTPUT or GPIO_CLOCK.

Notes:

Note that only wiringPi pin 1 (BCM_GPIO 18) supports PWM output and only wiringPi pin 7 (BCM_GPIO 4) supports CLOCK output modes.

This function has no effect when in Sys mode. If you need to change the pin mode, then you can do it with the gpio program in a script before you start your program.

11.1.31 piRevisionNames(index as Integer) as string

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function**: Maps revision numbers to names.
11.1.32  **piUnlock(Key as Integer)**

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Unlocks a synchronization lock.

**Notes:**

These allow you to synchronise variable updates from your main program to any threads running in your program. keyNum is a number from 0 to 3 and represents a “key”. When another process tries to lock the same key, it will be stalled until the first process has unlocked the same key.

You may need to use these functions to ensure that you get valid data when exchanging data between your main program and a thread – otherwise it’s possible that the thread could wake-up halfway during your data copy and change the data – so the data you end up copying is incomplete, or invalid.

11.1.33  **pullUpDnControl(pin as Integer, pud as Integer)**

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This sets the pull-up or pull-down resistor mode on the given pin, which should be set as an input.

**Notes:**

Unlike the Arduino, the BCM2835 has both pull-up an down internal resistors. The parameter pud should be: kPUD_OFF, (no pull up/down), kPUD_DOWN (pull to ground) or kPUD_UP (pull to 3.3v) The internal pull up/down resistors have a value of approximately 50KΩ on the Raspberry Pi.

This function has no effect on the Raspberry Pi’s GPIO pins when in Sys mode. If you need to activate a pull-up/pull-down, then you can do it with the gpio program in a script before you start your program.

11.1.34  **pwmSetClock(divisor as Integer)**

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This sets the divisor for the PWM clock.

11.1.35  **pwmSetMode(mode as Integer)**

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The PWM generator can run in 2 modes – “balanced” and “mark:space”.

**Notes:** The mark:space mode is traditional, however the default mode in the Pi is “balanced”. You can switch modes by supplying the parameter: kPWM_MODE_BAL or kPWM_MODE_MS.
11.1.36  pwmSetRange(range as UInt32)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This sets the range register in the PWM generator.  
**Notes:** The default is 1024.

11.1.37  pwmToneWrite(pin as Integer, value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Writes a tone.

11.1.38  pwmWrite(pin as Integer, value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Writes the value to the PWM register for the given pin.  
**Notes:**  
The Raspberry Pi has one on-board PWM pin, pin 1 (BMC_GPIO 18, Phys 12) and the range is 0-1024. Other PWM devices may have other PWM ranges.  
This function is not able to control the Pi’s on-board PWM when in Sys mode.

11.1.39  Read(fd as Integer, count as UInt64) as Memoryblock

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Read attempts to read count bytes of data from the object referenced by the descriptor fildes into a buffer.  
**Notes:**  
Returns the memoryblock on success (if we got more than zero bytes).  
Errno is set in case of error.

11.1.40  serialClose(fd as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Closes the device identified by the file descriptor given.
11.1.41 serialDataAvail(fd as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Returns the number of characters available for reading, or -1 for any error condition, in which case errno will be set appropriately.

11.1.42 serialFlush(fd as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This discards all data received, or waiting to be send down the given device.

11.1.43 serialGetchar(fd as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Returns the next character available on the serial device. **Notes:** This call will block for up to 10 seconds if no data is available (when it will return -1)

11.1.44 serialOpen(device as String, Baud as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This opens and initialises the serial device and sets the baud rate. **Notes:** It sets the port into “raw” mode (character at a time and no translations), and sets the read timeout to 10 seconds. The return value is the file descriptor or -1 for any error, in which case errno will be set as appropriate.

11.1.45 serialPutchar(fd as Integer, c as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sends the single byte to the serial device identified by the given file descriptor.

11.1.46 serialPutData(fd as Integer, data as Memoryblock)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sends the null-terminated string to the serial device identified by the given file descriptor. **Notes:** This sends text with any encoding.
11.1.47 serialPuts(fd as Integer, text as string)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Sends the null-terminated string to the serial device identified by the given file descriptor. **Notes:** This sends text with UTF-8 encoding.

11.1.48 setPadDrive(group as Integer, value as Integer)

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This sets the “strength” of the pad drivers for a particular group of pins. **Notes:** There are 3 groups of pins and the drive strength is from 0 to 7. Do not use this unless you know what you are doing.

11.1.49 SPIDataRW(channel as Integer, data as Memoryblock) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This performs a simultaneous write/read transaction over the selected SPI bus. **Notes:**

Data that was in your buffer is overwritten by data returned from the SPI bus.

That’s all there is in the helper library. It is possible to do simple read and writes over the SPI bus using the standard read() and write() system calls though – write() may be better to use for sending data to chains of shift registers, or those LED strings where you send RGB triplets of data. Devices such as A/D and D/A converters usually need to perform a concurrent write/read transaction to work.

11.1.50 SPIGetFd(channel as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Queries the file descriptor for a channel.

11.1.51 SPISetup(channel as Integer, speed as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This is the way to initialise a channel (The Pi has 2 channels; 0 and 1). **Notes:**

The speed parameter is an integer in the range 500,000 through 32,000,000 and represents the SPI clock speed in Hz.
The returned value is the Linux file-descriptor for the device, or -1 on error. If an error has happened, you may use the standard errno global variable to see why.

11.1.52  SPISetupMode(channel as Integer, speed as Integer, mode as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This is the way to initialise a channel (The Pi has 2 channels: 0 and 1).

**Notes:**

The speed parameter is an integer in the range 500,000 through 32,000,000 and represents the SPI clock speed in Hz.

The returned value is the Linux file-descriptor for the device, or -1 on error. If an error has happened, you may use the standard errno global variable to see why.

11.1.53  wiringPiSetup as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Initializes the library.

**Notes:**

This initialises wiringPi and assumes that the calling program is going to be using the wiringPi pin numbering scheme. This is a simplified numbering scheme which provides a mapping from virtual pin numbers 0 through 16 to the real underlying Broadcom GPIO pin numbers. See the pins page for a table which maps the wiringPi pin number to the Broadcom GPIO pin number to the physical location on the edge connector.

This function needs to be called with root privileges.

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

11.1.54  wiringPiSetupGpio as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Initializes the library.

**Notes:**

This is identical to wiringPiSetup, however it allows the calling programs to use the Broadcom GPIO pin numbers directly with no re-mapping.
11.1.1 MODULE WIRINGPIMBS

As above, this function needs to be called with root privileges, and note that some pins are different from revision 1 to revision 2 boards.

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

11.1.55 wiringPiSetupPhys as Integer

Notes:
Identical to wiringPiSetup, however it allows the calling programs to use the physical pin numbers on the P1 connector only.

As above, this function needs to be called with root privileges.

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

11.1.56 wiringPiSetupSys as Integer

Notes:
This initialises wiringPi but uses the /sys/class/gpio interface rather than accessing the hardware directly. This can be called as a non-root user provided the GPIO pins have been exported before-hand using the gpio program. Pin numbering in this mode is the native Broadcom GPIO numbers – the same as wiringPiSetupGpio() above, so be aware of the differences between Rev 1 and Rev 2 boards.

Note: In this mode you can only use the pins which have been exported via the /sys/class/gpio interface before you run your program. You can do this in a separate shell-script, or by using the system() function from inside your program to call the gpio program.

Also note that some functions have no effect when using this mode as they’re not currently possible to action unless called with root privileges. (although you can use system() to call gpio to set/change modes if needed)

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.
11.1.57  wpiPinToGpio(wpiPin as Integer) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** This returns the BCM_GPIO pin number of the supplied wiringPi pin.  
**Notes:** It takes the board revision into account.

11.1.58  Write(fd as Integer, data as Memoryblock) as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Write to a file descriptor.  
**Notes:**  
Write attempts to write bytes to the object referenced by the descriptor fd.  
Upon successful completion the number of bytes which were written is returned. Otherwise, a -1 is returned and the global variable errno is set to indicate the error.

11.1.59  Properties

11.1.60  ErrNo as Integer

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** The last error code from the underlying Linux functions.  
**Notes:**  
must be called directly after a function to have the result from that function. Calling any other function including writing a debug log, may cause this value to be reset.  
(Read only property)

11.1.61  LoadError as String

Plugin Version: 15.3, Console & Web: Yes, Mac: No, Win: No, Linux: Yes. **Function:** Returns the last load error.  
**Notes:** (Read only property)
11.1.62 Constants

11.1.63 \texttt{kGPIO\_CLOCK} = 3

Plugin Version: 15.3. \textbf{Function:} One of the pin mode constants. 
\textbf{Notes:} GPIO Clock

11.1.64 \texttt{kHIGH} = 1

Plugin Version: 15.3. \textbf{Function:} The constant for high value.

11.1.65 \texttt{kINPUT} = 0

Plugin Version: 15.3. \textbf{Function:} One of the pin mode constants. 
\textbf{Notes:} Input

11.1.66 \texttt{kINT\_EDGE\_BOTH} = 3

Plugin Version: 15.3. \textbf{Function:} One of the interrupt level constants. 
\textbf{Notes:} Both

11.1.67 \texttt{kINT\_EDGE\_FALLING} = 1

Plugin Version: 15.3. \textbf{Function:} One of the interrupt level constants. 
\textbf{Notes:} Failing

11.1.68 \texttt{kINT\_EDGE\_RISING} = 2

Plugin Version: 15.3. \textbf{Function:} One of the interrupt level constants. 
\textbf{Notes:} Rising

11.1.69 \texttt{kINT\_EDGE\_SETUP} = 0

Plugin Version: 15.3. \textbf{Function:} One of the interrupt level constants. 
\textbf{Notes:} Setup
11.1.70  kLOW = 0

Plugin Version: 15.3. **Function:** The constant for low value.

11.1.71  kOUTPUT = 1

Plugin Version: 15.3. **Function:** One of the pin mode constants.
**Notes:** Output

11.1.72  kPI MAKER EGOMAN = 1

Plugin Version: 15.3. **Function:** One of the maker values.
**Notes:** Egoman

11.1.73  kPI MAKER MBEST = 4

Plugin Version: 15.3. **Function:** One of the maker values.
**Notes:** MBest

11.1.74  kPI MAKER QISDA = 3

Plugin Version: 15.3. **Function:** One of the maker values.
**Notes:** QISDA

11.1.75  kPI MAKER SONY = 2

Plugin Version: 15.3. **Function:** One of the maker values.
**Notes:** Sony

11.1.76  kPI MAKER UNKNOWN = 0

Plugin Version: 15.3. **Function:** One of the maker values.
**Notes:** Unknown
11.1.77  kPI_MODEL__2 = 6

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** Model 2

11.1.78  kPI_MODEL__A = 1

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** Model A

11.1.79  kPI_MODEL__AP = 5

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** Model AP

11.1.80  kPI_MODEL__B = 2

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** Model B

11.1.81  kPI_MODEL__BP = 3

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** Model BP

11.1.82  kPI_MODEL__CM = 4

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** Model CM
11.1.83  kPI_MODEL_UNKNOWN = 0

Plugin Version: 15.3. **Function:** One of the model constants.
**Notes:** unknown

11.1.84  kPI_VERSION_1 = 1

Plugin Version: 15.3. **Function:** One of the version constants.
**Notes:** Version 1

11.1.85  kPI_VERSION_1_1 = 2

Plugin Version: 15.3. **Function:** One of the version constants.
**Notes:** Version 1.1

11.1.86  kPI_VERSION_1_2 = 3

Plugin Version: 15.3. **Function:** One of the version constants.
**Notes:** Version 1.2

11.1.87  kPI_VERSION_2 = 4

Plugin Version: 15.3. **Function:** One of the version constants.
**Notes:** Version 2

11.1.88  kPI_VERSION_UNKNOWN = 0

Plugin Version: 15.3. **Function:** One of the version constants.
**Notes:** Unknown version

11.1.89  kPUD_DOWN = 1

Plugin Version: 15.3. **Function:** One of the pull up/down constants.
**Notes:** pull to ground
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11.1.90 kPUD_OFF = 0

Plugin Version: 15.3. Function: One of the pull up/down constants. Notes: no pull up/down

11.1.91 kPUD_UP = 2

Plugin Version: 15.3. Function: One of the pull up/down constants. Notes: pull to 3.3v

11.1.92 kPWM_MODE_BAL = 1

Plugin Version: 15.3. Function: One of the PWM generator modes. Notes: Balanced

11.1.93 kPWM_MODE_MS = 0

Plugin Version: 15.3. Function: One of the PWM generator modes. Notes: Mark:Space

11.1.94 kPWM_OUTPUT = 2

Plugin Version: 15.3. Function: One of the pin mode constants. Notes: PWM Output

11.1.95 kPWM_TONE_OUTPUT = 6

Plugin Version: 15.3. Function: One of the pin mode constants. Notes: Tone Output

11.1.96 kSOFT_PWM_OUTPUT = 4

Plugin Version: 15.3. Function: One of the pin mode constants. Notes: PWM Output
11.1.97 kSOFT_TONE_OUTPUT = 5

Plugin Version: 15.3. **Function:** One of the pin mode constants.
**Notes:** Tone Output
Chapter 12

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• 13.0.262 Xojo or my RB application itself crashes on launch on Mac OS Classic. Why? 350
Chapter 13

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13.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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
end if
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
end if
return hoursString + minutesString + Format(seconds, "00")
End Function

Notes: (from the rb mailinglist)

13.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.NSCalibratedRGBColorSpace)
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
Notes: As you see we convert color to Calibrated RGB for best results.
See also:

- 13.0.3 How to catch delete key?
- 13.0.4 How to convert cmyk to rgb?
- 13.0.5 How to delete a folder?
- 13.0.6 How to detect if CPU if 64bit processor?
- 13.0.7 How to refresh a htmlviewer on Windows?

13.0.3 How to catch delete key?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: The following is the code in keydown event catches delete or backspace keys.

Example:

```vba
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:

- 13.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection?
- 13.0.4 How to convert cmyk to rgb?
- 13.0.5 How to delete a folder?
- 13.0.6 How to detect if CPU if 64bit processor?
- 13.0.7 How to refresh a htmlviewer on Windows?

13.0.4 How to convert cmyk to rgb?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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:**

```vbscript
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:

- 13.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 192
- 13.0.3 How to catch delete key? 193
- 13.0.5 How to delete a folder? 195
- 13.0.6 How to detect if CPU if 64bit processor? 196
- 13.0.7 How to refresh a htmlviewer on Windows? 196
13.0.5 How to delete a folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** The following is the code deletes a folder recursively.

**Example:**

```vba
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
        else ' file
            fo.Delete
        end if
    next

    f.Delete
End Sub
```

See also:

- 13.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 192
- 13.0.3 How to catch delete key? 193
- 13.0.4 How to convert cmyk to rgb? 193
- 13.0.6 How to detect if CPU if 64bit processor? 196
- 13.0.7 How to refresh a htmlviewer on Windows? 196
13.0.6 How to detect if CPU if 64bit processor?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 13.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 192
- 13.0.3 How to catch delete key? 193
- 13.0.4 How to convert cmyk to rgb? 193
- 13.0.5 How to delete a folder? 195
- 13.0.7 How to refresh a htmlviewer on Windows? 196

13.0.7 How to refresh a htmlviewer on Windows?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can ask the browser to reload the website with this code line:

**Example:**

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:

- 13.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 192
- 13.0.3 How to catch delete key? 193
- 13.0.4 How to convert cmyk to rgb? 193
- 13.0.5 How to delete a folder? 195
- 13.0.6 How to detect if CPU if 64bit processor? 196
13.0.8 Is there an example for vector graphics in Xojo?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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```

13.0.9 Picture functions do not preserve resolution values?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.10 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. 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

13.0.11 API client not supported?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.12 Can I access Access Database with Java classes?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** You can use ucanaccess to access databases created with Microsoft

**Example:**

```vbs
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

13.0.13 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Sorry, no. We can’t provide a graphics subclass from plugin.
Notes:
The is a feature request to allow graphics subclasses:
Feedback case 11391: feedback://showreport?report_id=11391

13.0.14 Can I use AppleScripts in a web application?

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.
13.0.15 Can I use graphics class with DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Sorry, no. We can’t provide a graphics subclass from plugin.

**Notes:**

The is a feature request to allow graphics subclasses:
Feedback case 11391: feedback://showreport?report_id=11391

13.0.16 Can I use sockets on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, but they run on the server, not on the client.

**Notes:**

You can use HTTPSocket, SMTPSocket, POP3Socket, SMTPSecureSocket, SecurePOPSocket, EasyTCP-Socket, 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 SMPTSocket may be a good idea for sending emails from the server like notifications.

13.0.17 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.

**Example:**

```plaintext
// 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 choosen 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 & hbbbbbb
colors.Append & h8844ff

if TargetLinux then
```
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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.softLighting(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, & bbffffff, 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.
13.0.18 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.19 Can I use your plugin controls on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** No.

13.0.20 Can you get an unique machine ID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
13.0.21 ChartDirector: Alignment Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

<table>
<thead>
<tr>
<th>Constant</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGN_LEFT</td>
<td>0</td>
<td>Align to the left side of the boundary.</td>
</tr>
<tr>
<td>ALIGN_RIGHT</td>
<td>1</td>
<td>Align to the right side of the boundary.</td>
</tr>
<tr>
<td>ALIGN_CENTER</td>
<td>2</td>
<td>Align to the center of the boundary.</td>
</tr>
<tr>
<td>ALIGN_LEFT_BOTTOM</td>
<td>3</td>
<td>Align to the bottom left corner of the boundary.</td>
</tr>
<tr>
<td>ALIGN_RIGHT_BOTTOM</td>
<td>4</td>
<td>Align to the bottom right corner of the boundary.</td>
</tr>
<tr>
<td>ALIGN_LEFT_TOP</td>
<td>5</td>
<td>Align to the top left corner of the boundary.</td>
</tr>
<tr>
<td>ALIGN_RIGHT_TOP</td>
<td>6</td>
<td>Align to the top right corner of the boundary.</td>
</tr>
</tbody>
</table>

13.0.22 ChartDirector: Color Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** ChartDirector: Color Specification

**Notes:**

Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports colors 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 AARRGGBB, 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++,
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 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 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 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 the right of the bottom side, while BottomRight refers to the bottom of the right side. The reverse applies for a horizontal axis.

the prefix is "0x". For example, the syntax for the hexadecimal number 0xFFFFFFF 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 looks 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
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.

<table>
<thead>
<tr>
<th>Constant</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palette</td>
<td><code>FFFF0000</code></td>
<td>The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1).</td>
</tr>
<tr>
<td>BackgroundColor</td>
<td><code>FFFF0000</code></td>
<td>The background color.</td>
</tr>
<tr>
<td>LineColor</td>
<td><code>FFFF0001</code></td>
<td>The default line color.</td>
</tr>
<tr>
<td>TextColor</td>
<td><code>FFFF0002</code></td>
<td>The default text color.</td>
</tr>
<tr>
<td>[ Reserved ]</td>
<td><code>FFFF0003</code> - <code>FFFF0006</code></td>
<td>These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance.</td>
</tr>
<tr>
<td>SameAsMainColor</td>
<td><code>FFFF0007</code></td>
<td>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.</td>
</tr>
<tr>
<td>DataColor</td>
<td><code>FFFF0008</code></td>
<td>The starting point for the automatic data color allocation.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Constant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>defaultPalette</td>
<td>An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds).</td>
</tr>
<tr>
<td>whiteOnBlackPalette</td>
<td>An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds).</td>
</tr>
<tr>
<td>transparentPalette</td>
<td>An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent.</td>
</tr>
</tbody>
</table>

### 13.0.23 ChartDirector: Font Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 "FONTPATH".
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 (ntcorsva.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 "ntcorsva.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. Indirect Font Names
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:

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;normal&quot;</td>
<td>This default normal font, which is the first font in the font table. This is initially mapped to &quot;arial.ttf&quot; (Arial).</td>
</tr>
<tr>
<td>&quot;bold&quot;</td>
<td>The default bold font, which is the second font in the font table. This is initially mapped to &quot;arialbd.ttf&quot; (Arial Bold).</td>
</tr>
<tr>
<td>&quot;italic&quot;</td>
<td>The default italic font, which is the third font in the font table. This is initially mapped to &quot;ariali.ttf&quot; (Arial Italic).</td>
</tr>
<tr>
<td>&quot;boldItalic&quot;</td>
<td>The default bold-italic font, which is the fourth font in the font table. This is initially mapped to &quot;arialbi.ttf&quot; (Arial Bold Italic).</td>
</tr>
<tr>
<td>&quot;fontN&quot;</td>
<td>The (N + 1)th font in the font table (the first font is &quot;font0&quot;).</td>
</tr>
</tbody>
</table>

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 fonts in your charts in one place. Font Index
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. Font Size
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.

**Font Color**
This is the color to draw the font. (See Color Specification on how colors are represented in ChartDirector.)

**Font Angle**
This is the angle in degrees by which the font should be rotated anti-clockwise.

**Vertical Layout**
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.

### 13.0.24 ChartDirector: Mark Up Language

**Plugin Version:** 8.2, **Console & Web:** No, **Mac:** Yes, **Win:** Yes, **Linux:** Yes. **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!</font></font>
```

will result in the following text rendered:

```
Hello world!
```

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.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;*</code></td>
<td>Set the following text to be in superscript style. This attribute does not need to have a value. (You may</td>
</tr>
</tbody>
</table>
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.

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.
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:
Hydrazino Molecule

The above starts `<*block,align=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:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>width</td>
<td>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.</td>
</tr>
<tr>
<td>height</td>
<td>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.</td>
</tr>
<tr>
<td>maxwidth</td>
<td>The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines.</td>
</tr>
<tr>
<td>truncate</td>
<td>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 &quot;...&quot;.</td>
</tr>
<tr>
<td>linespacing</td>
<td>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.</td>
</tr>
<tr>
<td>bgColor</td>
<td>The background color of the block in hex format.</td>
</tr>
<tr>
<td>valign</td>
<td>The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle.</td>
</tr>
</tbody>
</table>

The value baseline means the baseline of sub-blocks should align with the baseline of the block. The baseline 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 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.

halignment 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.

13.0.25 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 } % )”
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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 in 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.

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.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sector</td>
<td>The sector number. The first sector is 0, while the nth sector is (n-1).</td>
</tr>
<tr>
<td>dataSet</td>
<td>Same as { sector }. See above.</td>
</tr>
<tr>
<td>label</td>
<td>The text label of the sector.</td>
</tr>
<tr>
<td>dataSetName</td>
<td>Same as { label }. See above.</td>
</tr>
<tr>
<td>value</td>
<td>The data value of the sector.</td>
</tr>
<tr>
<td>percent</td>
<td>The percentage value of the sector.</td>
</tr>
<tr>
<td>fieldN</td>
<td>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.</td>
</tr>
</tbody>
</table>

{ 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
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:mm: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 have 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 "&amp;# nn;" (eg. ">" will become "&amp;# 62;".). 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.
13.0.26 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:
13.0.27 Copy styled text?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: How to quickly copy styled text from one textarea to another?

Example:

```plaintext
# 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.

13.0.28 Do you have code to validate a credit card number?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: You can check the checksum to tell if a credit card number is not valid.

Example:

```plaintext
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)

13.0.29 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all, Console & Web: No. 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. Than we can talk about the plugin.

13.0.30 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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. Than 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.
13.0.31 Does the plugin home home?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

13.0.32 folderitem.absolutepath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Paths on a Mac are not unique, so use them only to display them to the user.

**Example:**

```vba
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
```
13.0.33 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?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** This code implements animations for a tabpanel change:

**Example:**

```plaintext
// 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.

13.0.34 How about Plugin support for older OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.35 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all, Console & Web: No. 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.cpfamily")
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.

13.0.36 How can I disable the close box of a window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. 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.
13.0.37 How can I get all the environment variables from Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: Try this code:
Example:

```vbnet
# 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.

13.0.38 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, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: You need to get a media reservation.
Example:

```vbnet
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.
13.0.39 How can I get text from a PDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.40 How can I get text from a Word Document?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.41 How can I get the item string for a given file creator?

Plugin Version: all, Console & Web: No. **Answer:** Try this function:

**Example:**

```vba
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.>"
    end if
```

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.

13.0.42 How can I launch an app using it’s creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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

13.0.43 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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)
lwpthread.so.0 => /lib/i386-linux-gnu/libpthread.so.0 (0xb66a8000)
lbstdc++.so.6 => /usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
lbm.so.6 => /lib/i386-linux-gnu/libbm.so.6 (0xb6979000)
lbgcc_s.so.1 => /lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
lbc.so.6 => /lib/i386-linux-gnu/libc.so.6 (0xb67b1000)
/libid-linux.so.2 (0xb676e000)
lbgdk-x11-2.0.so.0 => /usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
lplibpangocairo-1.0.so.0 => /usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
lbX11.so.6 => /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 => /lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 => /lib/i386-linux-gnu/libcairo.so.2 (0xb664ce000)
lbgdk_pixbuf-2.0.so.0 => /usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb66ad000)
lighbio-2.0.so.0 => /lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6356000)
lipmpangoft2-1.0.so.0 => /usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
lipmpango-1.0.so.0 => /lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
lipmfontconfig.so.1 => /lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
lipmbobject-2.0.so.0 => /lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb618c000)
lipmglib-2.0.so.0 => /lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
lipmXExt.so.6 => /lib/i386-linux-gnu/libXExt.so.6 (0xb6151000)
lipmXrender.so.1 => /lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
lipmXinerama.so.1 => /lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
lipmXi.so.6 => /lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
lipmXrandr.so.2 => /lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
lipmXcursor.so.1 => /lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
lipmXcomposite.so.1 => /lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
lipmXdamage.so.1 => /lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
lipmfreeetype.so.6 => /lib/i386-linux-gnu/libfreeetype.so.6 (0xb60f7b000)
lipmxcb.so.1 => /lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
lipmpixman-1.0.so.0 => /lib/i386-linux-gnu/libpixman-1.0.so.0 (0xb5f2000)
lipmpng.so.12 => /lib/i386-linux-gnu/libpng12.so.0 (0xb5f80000)
lipmxcbc-shm.so.0 => /lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f90000)
lipmxcbc-render.so.0 => /lib/i386-linux-gnu/libxcb-cursor.png,0 (0xb5f90000)
lipmz.so.1 => /lib/i386-linux-gnu/liblz.so.1 (0xb5f73000)
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.

13.0.44 How can I validate an email address?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code:

**Example:**

```vba
Dim re As RegEx
re = New RegEx
Dim rm As RegExMatch

re.SearchPattern = "; [a-z0-9!$%&'()*+,-./;=?^_`{|}~]+(?:\.(?:[a-z0-9!$%&'()*+,-./;=?^_`{|}~]+)*@(?:(?:[a-z0-9-]*\.[a-z0-9-]*\.[a-z0-9-]*))?)\)?"
rm = re.Search(editField1.Text)

if rm = Nil Then
    StaticText2.Text = editField1.Text + " not valid email"
Else
    StaticText2.Text = editField1.Text + " is valid"
End if

Notes:

Adapted from:
http://www.regular-expressions.info/email.html
13.0.45 How do I decode correctly an email subject?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** The following code can be used to decode an email subject including several encodings including Base 64.

**Example:**

```vba
dim src as string // input

dim theRegex as Regex
dim theRegexMatch as RegexMatch
dim result, infoCharset, encodedPart as string
dim theStart as Integer

if instr(src, "=?") >0 then
    theRegex = new Regex
    theRegex.Options.Greedy = false
    theRegex.searchPattern = "\(\.*\)=\?(\.+)?\?(Q \| B)\?(\.+)?\?="
    theRegexMatch = theRegex.search(src)
    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

```vba
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.

13.0.46 How do I enable/disable a single tab in a tabpanel?

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.

13.0.47 How do I find the root volume for a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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 Function
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13.0.48 How do I get the current languages list?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:

**Example:**

```plaintext
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
Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

13.0.49 How do I get the Mac OS Version?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:

**Example:**

```vbscript
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.

13.0.50 How do I get the printer name?

Plugin Version: all, Console & Web: No. **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:**

```vbscript
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)
```
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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.

13.0.51 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.52 How do I make a smooth color transition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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:

```vbnet
' 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.

13.0.53 How do I read the applications in the dock app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: Use CFPreferencesMBS class like in this example:

Example:

```vbnet
// 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.

13.0.54 How do I truncate a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: In a binarystream you can set the length property to truncate.
13.0.55 How do update a Finder’s windows after changing some files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: Try this code:

Example:

```plaintext
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.

13.0.56 How to access a USB device directly?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.57 How to add icon to file on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: You can use Folderitem.AddCustomIcon or NSWorkspaceMBS.setIcon functions.
13.0.58 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Using Apple Events you can use this code:

**Example:**

```vbscript
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).

---

13.0.59 How to automatically enable retina in my apps?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can run a build script on each build with this code:

**Example:**

```vbscript
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.
13.0.60 How to avoid leaks with Cocoa functions?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can try this code on Mac OS X:

**Example:**

```vbnet
// 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.

---

13.0.61 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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:

```xml
<key>LSEnvironment</key>
<dict>
    <key>test</key>
    <string>Hello World</string>
</dict>
```
13.0.62 How to avoid ___NSAutoreleaseNoPool console messages in threads?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You need to use your own NSAutoreleasePool on a thread like this:

**Example:**

```pascal
sub MyThread.run
dim pool as new NSAutoreleasePoolMBS
// do work here

pool=nil
end sub
```

**Notes:**

For more details read here:

13.0.63 How to bring app to front?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** On Mac you can use this code:

**Example:**

```pascal
// 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.
13.0.64  How to bring my application to front?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: This makes SimpleText (Code ttxt) 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)

13.0.65  How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.
13.0.66 How to change name of application menu?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Use this code to change the application menu name on Mac OS X:

**Example:**

```vbnet
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.

13.0.67 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 'plist' 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/.
13.0.68 How to check if a folder/directory has subfolders?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this to check all items in a folder:

**Example:**

```vba
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.

---

13.0.69 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Please use our IOPowerSourcesMBS class like this:

**Example:**

```vba
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 CFObjMBS = 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
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.

13.0.70 How to check if Microsoft Outlook is installed?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 RegistryAccessException
// not installed
Return false

end try

# else

// Windows only, so false on other platforms
Return false

# endif

End Function
13.0.71 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The code below returns a country value.

**Example:**

```vba
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.

13.0.72 How to code sign my app with plugins?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Mac and Windows to make sure they have not been modified.

In terminal, you do like this:

```
cd <Path to folder of 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/*.frame-```
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.

13.0.73 How to collapse a window?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use this function (Mac only):

**Example:**

```vbs
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.

13.0.74 How to compare two pictures?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code:

**Example:**

```vbs
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 is nil or u is 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
dend if

Exception
Return -1
End Function

Notes: Remember that this only works on bitmap pictures, so the picture.BitmapMBS function may be useful.

13.0.75 How to compile PHP library?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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 symbol _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.

13.0.76 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Use code like this:

Example:

Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
  case WebSession.BrowserType.Android
    Return "Android"
  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"
13.0.77 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use code like this:

**Example:**

```vbnet
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 "Unknown: " + str(integer(s))
end Select
End Function
```

13.0.78 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use code like this:

**Example:**

```vbnet
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"
    else
        Return "Unknown: " + str(integer(s))
end Select
End Function
```
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 "Unknown: "+str(integer(s))
end Select
End Function

13.0.79 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

This code can help you although it's not perfect.
You need to set lc to the current color you use.

**Example:**

```vbs
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("Björn, this text should be converted")
Mac2PC.clear
```
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Notes:
You have to call Mac2PC.clear after every conversion to reset the encoding engine.
See also newer TextConverterMBS class.

13.0.80 How to convert ChartTime back to Xojo date?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: We have this example code:
Example:

```vbnet
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.

13.0.81 How to convert line endings in text files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.
Example:

```vbnet
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.

### 13.0.82 How to convert picture to string and back?

**Plugin Version:** all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes.  **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
13.0.83 How to copy an array?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use a function like this to copy an array:

**Example:**

```vba
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.

13.0.84 How to copy a dictionary?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use a function like this to copy a dictionary:

**Example:**

```vba
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 a dictionary of objects, you need to change code to also make a copy of those objects.
13.0.85  How to copy parts of a movie to another one?

Answer: The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.

Example:

```vbnet
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.

13.0.86  How to create a birthday like calendar event?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No.  
Answer: Try this code:

Example:

```vbnet
// 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.

13.0.87 How to create a GUID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the UUIDMBS class for this.

13.0.88 How to create a Mac picture clip file?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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("AQAAAAAAAAAAAAAAAAACAFRDRVIAAAABAAAAAAABUQ0lQAAAAAQAAAAAAAAAA")
r.AddResource(data,"drag",128,"") 'ditto
r.Close

Notes: In general Apple has deprecated this, but a few application still support clippings.

13.0.89 How to create a PDF file in Xojo?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.
13.0.90 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use code like the one below:

**Example:**

```vba
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.

13.0.91 How to create PDF for image files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use DynaPDF like this:

**Example:**

```vba
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.

13.0.92 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Below a few tips on how to translate command line CURL calls to plugin calls.

Notes:

• 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/f2f4e540bf8bb60f61cfc3d4328001c59 -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)

13.0.93 How to delete file with ftp and curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can set post/pre quotes to have ftp commands executed before or after the download/upload.

**Example:**

```vbnet
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.
13.0.94  How to detect display resolution changed?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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".

13.0.95  How to detect retina?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use WindowBackingScaleFactorMBS to query the factor.

**Example:**

```
msgbox str(window1BackingScaleFactorMBS)
```

13.0.96  How to disable force quit?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

13.0.97  How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.
13.0.98 How to display a PDF file in Xojo?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.99 How to do a lottery in RB?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Try this function:

Example:

```vbnet
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
```
Sub Open()
    // Test it

dim za(0) as Integer ' the array of the numbers

lotto 49,6,za ' 6 of 49 in Germany

' and display them
staticText1.text=str(za(0))+chr(13)+str(za(1))+chr(13)+str(za(2))+chr(13)+str(za(3))+chr(13)+str(za(4))+chr(13)+str(za(5))+chr(13)
End Sub

13.0.100 How to do an asycron DNS lookup?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: use CFHostMBS class (Mac OS X only).

Notes:
Xojo internal functions and plugin DNS functions are sycronized.
You can use DNSLookupThreadMBS class for doing them asyncron.

13.0.101 How to draw a dushed pattern line?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: You can try this code:

Example:

// call like this: DrawDushedPatternLine g,0,0,width,height,10

Sub DrawDushedPatternLine(g as graphics,x1 as Integer,y1 as Integer,x2 as Integer,y2 as Integer, partlen as Integer)
    dim x,y,ox,oy as Double
    dim dx,dy as Double
    dim w,h,d as Double
    dim b as Boolean

    w=x2-x1
    h=y2-y1
    d=sqrt(w*w+h*h)
dx=w/d*partlen
dy=h/d*partlen
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.

13.0.102 How to draw a nice antialiased line?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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

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.
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.

13.0.103 How to dump java class interface?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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
13.0.104 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this function:

**Example:**

```xoj
Function Duplicate(extends p as Picture) As Picture
    # if RBVersion >= 2011.04 then
    if p.HasAlphaChannel then

        // create new 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.

13.0.105 How to enable assistive devices?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use AppleScript code like below:

**Notes:**

```plaintext
tell application "System Events"
activate
set UI elements enabled to true
return UI elements enabled
end tell
```

You can run this with AppleScriptMBS class.

13.0.106 How to encrypt a file with Blowfish?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this:

**Example:**

```plaintext
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.
13.0.107 How to extract text from HTML?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:

**Example:**

```vbs
dim html as string = "<p><b>Grüße</b></p>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)

MsgBox text // shows: Grüße
```

**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 &auml; to ä.

13.0.108 How to find empty folders in a folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Try this code:

**Example:**

```vbs
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
```
13.0.109 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can try Launch Services.

**Example:**

```vba
Dim f As FolderItem
f = LaunchServicesFindApplicationForInfoMBS("hook", "com.apple.iTunes", "iTunes.app")
MsgBox f.NativePath
```

13.0.110 How to find network interface for a socket by it’s name?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use our plugin to build a lookup table.

**Example:**

```vba
Function FindNetworkInterface(name As String) As NetworkInterface
    Name = name.Trim
    If name.len = 0 Then Return Nothing

    '// search by IP/MAC
    Dim u As Integer = System.GetNetworkInterfaceCount - 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.IPs
        Dim IPv6s() As String = n.IPs
        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
    Next

    Return Nothing
End Function
```

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, "") = namethen
        Return n
        end if
    if map.Lookup(n.MACAddress, "") = namethen
        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.

13.0.111 How to find version of Microsoft Word?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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".
13.0.112 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You probably connect with SSL and you have no valid certificate.  
**Example:**

```mbs
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.UnixpathMBS
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/

13.0.113 How to format double with n digits?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use the FormatMBS function for this.  
**Example:**

```mbs
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)
```
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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.

13.0.114 How to get a time converted to user time zone in a web app?

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

13.0.115 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. 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
13.0.116  How to get CFAbsoluteTime from date?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Use code like this:

**Example:**

```vbs
' Access the current date
Dim d As New Date

' Access the current time zone
Dim t As CFTimeZoneMBS = SystemCFTimeZoneMBS

' Create a Gregorian date record
Dim g As New CFGregorianDateMBS

' Set the date values for the record
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

' Query the absolute time for the given time zone
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.

---

13.0.117  How to get client IP address on web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the WebSession.RemoteAddress property.

**Example:**

```vbs
Sub Open()
    Title = Session.RemoteAddress
End Sub
```
13.0.118 How to get fonts to load in charts on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use the SetFontSearchPath method in the CDBaseChartMBS class to specify where your fonts are.

**Example:**

```pascal
if TargetLinux then
  CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype"
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.

---

13.0.119 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use the AddFontSearchPath method in the DynaPDFMBS class to specify where your fonts are.

**Example:**

```pascal
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.
13.0.120 How to get GMT time and back?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use the date class and the GMTOffset property.

**Example:**

```vbnet
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MessageBox 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.

13.0.121 How to get good crash reports?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Check this website from the webkit website:

**Notes:** [http://webkit.org/quality/crashlogs.html](http://webkit.org/quality/crashlogs.html)

13.0.122 How to get list of all threads?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.123 How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.124 How to get the color for disabled textcolor?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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:

c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

13.0.125 How to get the current free stack space?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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 ThreadCurrentStackSpace lib "Carbon" (threadid as Integer, byref size as Integer) as short

if GetCurrentThread(threadid)=0 then
if 0=ThreadCurrentStackSpace(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 you like for that.

13.0.126 How to get the current timezone?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. 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

13.0.127 How to get the current window title?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: The code below returns the current window title for the frontmost window on Mac OS X if Accessibilty services are

Example:

Function CurrentWindowTitle() As string
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

s = CSStringFromCFString(FocusedApplicationElement.Name)
cs = CFStringMBS(s)
return CSStringMBS(cs)
end if
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 Function

13.0.128  How to get the cursor blink interval time?


Example:

    declare function GetCaretTime lib "Carbon" () as Integer

    MsgBox str(GetCaretTime())+” ticks”

Notes: 60 ticks make one second.

13.0.129  How to get the list of the current selected files in the Finder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No.  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.folderItemItem(i)
dateiname=f.name
// editfield1 with property "multiline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
end if
13.0.130 How to get the Mac OS system version?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The following code queries the value and displays the version number:

**Example:**

```vba
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)

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
```

13.0.131 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:

**Example:**

```vba
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.

13.0.132 How to get the screen size excluding the task bar?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: Try this code:
Notes: Use the Screen class with the available* properties.

13.0.133 How to get the size of the frontmost window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. 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!
13.0.134 How to get the source code of a HTMLViewer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: Try this code:

Example:

    // for Windows:
    msgbox HTMLViewer1.IEHTMLTextMBS

    // for Mac OS X:
    msgbox HTMLViewer1.mainFrameMBS.dataSource.data

13.0.135 How to get Xojo apps running Linux?


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.

13.0.136 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Sometimes it may be better to use an extra application to process images.

Notes:

A typical 32 bit app made with Xojo (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.
13.0.137 How to handle tab key for editable cells in listbox?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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 listColumnType(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 listColumnType(i) >= list.TypeEditable then
                list.EditCell(row, i)
                Return true
            end if
        next
        end if
    end if
else
    // forward
    // look for column right
    for i as Integer = column+1 to list.ColumnCount-1
        if listColumnType(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 listColumnType(i) >= list.TypeEditable then
                list.EditCell(row, i)
                Return true
            end if
        next
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.

13.0.138 How to hard link MapKit framework?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.
13.0.139 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.

Example:

```vba
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.

13.0.140 How to hide all applications except mine?

Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: The code below will on Mac OS hide all applications except your one:

Example:

```vba
dim p as new ProcessMBS

p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

13.0.141 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: Set Internet Explorer to silent mode with code like this:

Example:
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htmlviewer1._ole.Content.value("Silent") = True

Notes: Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

13.0.142 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** If you want to hide something in a chart, simply assign the kTransparent constant as color.

13.0.143 How to hide the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

13.0.144 How to insert image to NSTextView or TextArea?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

13.0.145 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. 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’’”
elseif TargetMacOS then
call HTMLViewer1.EvaluateJavaScriptMBS "window.location = "’’# 16’’”
else
// not supported
end if

13.0.146 How to keep a movieplayer unclickable?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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
13.0.147 How to keep my web app from using 100% CPU time?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** On Linux and Mac OS X 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.

13.0.148 How to kill a process by name?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.149 How to know how many CPUs are present?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

13.0.150 How to know the calling function?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.
13.0.151  How to launch an app using it’s creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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

13.0.152  How to launch disc utility?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.153  How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.154 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.155 How to make a window borderless on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. 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 = & H80880000

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, hWndInsertAfter 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

13.0.156 How to make an alias using AppleEvents?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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

13.0.157 How to make AppleScripts much faster?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** use "ignoring application responses" like in this example:
**Notes:**
on run { fn,fpx,fpy }
ingnoring application responses
tell app "Finder" to set the position of folder fn to fpx,fpy
end ignoring
end run

13.0.158 How to make double clicks on a canvas?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.
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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 GetDblTime Lib "Carbon" () as Integer
doubleClickTime = GetDblTime()
   # 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

13.0.159 How to make my Mac not sleeping?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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 HDActivity = 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.
**13.0.160 How to make my own registration code scheme?**

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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?

**13.0.161 How to make small controls on Mac OS X?**

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can try this code on Mac OS X:

**Example:**

```plaintext
'/*
* 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 OSType, 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))

13.0.162 How to mark my Mac app as background only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.163 How to move a file or folder to trash?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.164 How to move an application to the front using the creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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)

13.0.165 How to move file with ftp and curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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 "RNTO 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 RNTO with the new file name. To delete use DELE and the file path.

13.0.166 How to normalize string on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.167 How to obscure the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.168 How to open icon file on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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

13.0.169 How to open PDF in Acrobat reader?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.170 How to open printer preferences on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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

13.0.171 How to open special characters panel on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.172  How to optimize picture loading in Web Edition?

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.

13.0.173  How to parse XML?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes.  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.

13.0.174  How to play audio in a web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes.  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:

```java
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:

```java
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 element.""</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.

```java
me.ExecuteJavaScript("document.getElementById('mymusic').play();")
```

same for pause:

```java
me.ExecuteJavaScript("document.getElementById('mymusic').pause();")
```
and finally for changing volume:

me.ExecuteJavaScript("document.getElementById('mymusic').volume="+str(me.Value/100.0)+");")

### 13.0.175 How to pretty print xml?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the XML Transform method with the right XLS.

**Notes:**

Learn more here:

### 13.0.176 How to print to PDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** This code below shows how to redirect printing to a PDF file on Mac OS X.

**Example:**

```vbnet
// 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.
13.0.177 How to query Spotlight’s Last Open Date for a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use a MDItemMBS object to query this value:

**Example:**

```vbscript
Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
# If Target MacOS 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.

13.0.178 How to quit windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:

**Example:**

```vbscript
# if target win32 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.

13.0.179 How to read a CSV file correctly?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:

**Example:**

```vbscript
' 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.

13.0.180 How to read the command line on windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:

**Example:**
# if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=Get CommandLineA()
s=mem.cstring(0)

# endif

Notes: Newer Xojo versions have a system.commandline property.

### 13.0.181 How to render PDF pages with PDF Kit?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code: **Example:**

```vba
// 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.

13.0.182 How to restart a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: Ask the Finder via Apple Events:

Example:

```vba
    dim ae as appleevent
    ae=newappleEvent("FNDR","rest","MACS")
    if not ae.send then
        msgBox "The computer couldn’t be restarted."
    end if
```

13.0.183 How to resume ftp upload with curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.184 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: This code opens a PDF and draws the first page into a new PDF with 90° rotation.

Example:

```vba
    // 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.

13.0.185 How to rotate image with CoreImage?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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)
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// 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

13.0.186  How to run a 32 bit application on a 64 bit Linux?

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.

13.0.187  How to save HTML Viewer to PDF with landscape orientation?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No.  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.

13.0.188 How to save RTFD?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.rtfd")
if f = nil then Return

dim a as NSAttributedStringMBS = textView.textStorage
dim w as NSFileWrapperMBS = a.RTFDFileWrapperFromRange(0, a.length, DocumentAttributes)

dim e as NSErrorMBS
if w.writeToFile(f, e) then

else
MsgBox e.localizedDescription
end if

Notes: For Text Area you can query the underlying NSTextViewMBS object via Text Area.NSTextViewMBS method.

13.0.189 How to save RTFD?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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
Dim dataURL As String = "data:application/pdf;base64," + base64string

// show in webview
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.

13.0.190 How to scale a picture proportionally with mask?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

### 13.0.191 How to scale a picture proportionally?

**Plugin Version:** all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** For a proportional scaling, we calculate the new picture size relative to the target maximum size.

**Example:**

```vba
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)
13.0.192 How to scale/resize a picture?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.

Example:

```xojo
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.

13.0.193 How to search with regex and use unicode codepoints?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: You can specify unicode characters in search string with backslash x and digits.

Example:

```xojo
dim r as RegExMbs
dim s as string
dim c as Integer

s = "123 äöü ABC 456"

r = new RegExMBS
```
if r.Compile("ö.") 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 ö 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

13.0.194 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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
13.0.195 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You use the pragma cache_size command on the database.

**Example:**

```vbnet
// 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.

13.0.196 How to set the modified dot in the window?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this declares:

**Example:**

```vbnet
Window1.ModifiedMBS = True
```

13.0.197 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use a WebHTMLViewer control and load the

**Example:**

```vbnet
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.

13.0.198 How to show Keyboard Viewer programmatically?

Console & Web: No, Mac: Yes, Win: No, Linux: No. 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/Key-
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boardViewerServer.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

13.0.199 How to show the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: Try this declare:
Example:
Declare Sub ShowCursor Lib "Carbon" ()
ShowCursor

Notes: The MBS Plugin has this function and supports it on Windows, too.

13.0.200 How to shutdown a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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 immediately: No document asked to be saved, all applications quitting without knowing).
13.0.201 How to sleep a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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

13.0.202 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.203 How to use PDFLib in my RB application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: The PDFlib plugin was discontinued in favor of our DynaPDF plugin.
Notes: If you need help to move, please contact us.

13.0.204 How to use quotes in a string?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Just double them.
Example:

msgbox "This String contains ""quotes""."
13.0.205  How to use Sybase in Web App?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:

```bash
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
```

13.0.206  How to use the Application Support folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Application Support Folder. 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

```bash
//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)
```

**Example:**

```bash
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.UnixpathMBS

Notes: You may not be able to write there with a normal user account!

13.0.207 How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: You can use the following code which does this using the SoftDeclareMBS class.

Example:

Sub Open()
    dim c as CFDateMBS
    dim t as CF_absoluteTimeMBS

    // 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 cfarrayMBS
    dim s as SoftDeclareMBS
    dim m as MemoryBlock

    s=new SoftDeclareMBS

    if s.LoadLibrary("IOKit.framework") then
        if s.LoadFunction("IOPMCopyScheduledPowerEvents") then

            // Your code here...

        end if
    end if
end function
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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

'/*
'@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.

13.0.208 How to validate a GUID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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 = "^\{ [ 0-9a-fA-F ] \} \{ 8 \} \{- [ 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".

13.0.209 How to walk a folder hierarchie non recursively?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer: Use code like this one: Example:

```vba
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.
13.0.210 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

13.0.211 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
Finally make sure you use the right serial number. Not an older one or a misspelled one.

13.0.212 I want to accept Drag & Drop from iTunes

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.

**Example:**

```vba
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.UnixpathMBS
end if

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.

13.0.213 I’m drawing into a listbox but don’t see something.

Plugin Version: all, Console & Web: No. 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.
13.0.214 I’m searching for a method or so to move a window from position x,y to somewhere else on the screen.

Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

13.0.215 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?

Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

13.0.216 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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

Notes: This test application shows the keycode (decimal) 63 for the fn key.
13.0.217 Is there a case sensitive Dictionary?

Plugin Version: all, Console & Web: No. **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

13.0.218 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use the DirectorySizeMBS class for this as in the example below:

**Example:**

```vbs
dim d as DirectorySizeMBS
d=new DirectorySizeMBS
```

```vbs
// 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.

13.0.219 **Is there an easy way I can launch the Displays preferences panel?**

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the code below:

**Example:**

```vbnet
dim error as Integer
error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
    MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

13.0.220 **List of Windows Error codes?**

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** We have a list of windows error codes on our website.

**Notes:** [http://www.monkeybreadsoftware.de/xojo/winerror.shtml](http://www.monkeybreadsoftware.de/xojo/winerror.shtml)

13.0.221 **Midi latency on Windows problem?**

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

13.0.222 My Xojo Web App does not launch. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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? Than 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?

13.0.223 SQLDatabase not initialized error?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Before you can use SQLDatabaseMBS, it must be initialized.

**Example:**
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**dim d as new SQLDatabaseMBS**

**Notes:**
This happens normally when you use "new SQLDatabaseMBS".
But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have hap-
pended, yet.
So please simply add a line "dim d as new SQLDatabaseMBS" to your app.open code after registration, so
the plugin part can initialize and late provide recordsets.

**13.0.224 Textconverter returns only the first x characters. Why?**

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

**13.0.225 The type translation between CoreFoundation/Foundation and Xojo
data types.**

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
- NSAttributedString -> NSAttributedString
- NSColorMBS -> NSColor
- NSRectMBS -> NSValue with NSRect
- NSSizeMBS -> NSValue with NSSize
- NPointMBS -> NSValue with NPoint
- NSRangeMBS -> NSValue with NSRange
- NSBurnMBS -> NSBurn
- NSViewMBS -> NSView
- NSFontMBS -> NSFont
- NSParagraphStyleMBS -> NSParagraphStyle
- NSAttributedStringStringMBS -> 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
- CFArraryMBS -> NSArray
- CFDictionaryMBS -> NSDictionary
- CFBinaryDataMBS -> NSDate
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Carbon CFTyperef 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 CFTyperef:

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.
13.0.226 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

13.0.227 What classes to use for hotkeys?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use Carbon-HotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows. **Notes:** CarbonHotKeyMBS will also work fine in Cocoa apps.

13.0.228 What do I need for Linux to get picture functions working?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.229 What does the NAN code mean?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

13.0.230 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:**

Xojo 4.5 has a constant "SmallSystem" to use for a font name.
For older versions try this code:

**Example:**

```vba
Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef fontStyle 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
```
13.0.231 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

13.0.232 What is last plugin version to run on PPC?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

13.0.233 What is the difference between Timer and WebTimer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Time is server side and WebTimer client side.

**Notes:** Timer is the normal timer class in Xojo. It runs on the server. On the 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.

13.0.234 What is the list of Excel functions?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Below 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, CHINV, CHITEST,
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13.0.235 What is the replacement for PluginMBS?

13.0.236 What to do on Xojo reporting a conflict?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.237 What to do with a NSImageCacheException?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** You need to add exception handlers for NSExceptionMBS 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 basically 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.

13.0.238 What to do with MySQL Error 2014?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can get this error on MySQL if you have a recordset open while you create another one.

13.0.239 What ways do I have to ping?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** You have different ways. **Notes:**

1. Use the shell class and the ping utility.

2. Use the MBS Network Plugin and there the SuperSocket part:

   a) On Windows the ICMPingMBS works to ping.
   b) On Mac OS X it uses OpenTransport and needs root rights. You need to use sudo to run this application.
This does not work on Intel Macs, because the plugin is not endian safe.

3. The DarwinPingMBS.Ping method:

Compiled for Mac OS X Macho target it works as a synchronized ping method. The Windows version had a bug and was fixed in plugin version 8.2pr4. So it works now.

4. The DarwinPingMBS.SimplePing method:

Works on Mac OS X Macho target.

But this method can be called from a thread to make it working in background.

13.0.240 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: This is now CGDisplayMBS.GetActiveDisplayList.

13.0.241 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: This is now CGDisplayMBS.GetDisplaysWithPoint.

13.0.242 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: This is now CGDisplayMBS.GetDisplaysWithRect.

13.0.243 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. Answer: This is now CGDisplayMBS.GetOnlineDisplayList.
13.0.244 Where is GetObjectClassNameMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.

13.0.245 Where is NetworkAvailableMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. 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.
13.0.246 Where is StringHeight function in DynaPDF?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. 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.

13.0.247 Where is XLSDocumentMBS class?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer: This class has been removed in favor of XLBookMBS class.
Notes: This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMerged-CellsMBS, XLSRowMBS and XLSSheetMBS.

13.0.248 Where to get information about file formats?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. Answer:
Please visit this web page:
http://www.wotsit.org

13.0.249 Where to register creator code for my application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. Answer:
Register at Apple:

13.0.250 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.251 Which plugins are 64bit only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. 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.

13.0.252 Why application doesn’t launch because of a missing ddraw.dll!?


13.0.253 Why application doesn’t launch because of a missing shlwapi.dll!?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. 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.
13.0.254 Why do I hear a beep on keydown?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

13.0.255 Why does folderitem.item return nil?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.256 Why doesn’t showurl work?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

13.0.257 Why don’t the picture functions not work on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.
13.0.258 Why have I no values in my chart?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

13.0.259 Will application size increase with using plugins?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

13.0.260 XLS: Custom format string guidelines

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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

### 13.0.261 Xojo doesn’t work with your plugins on Windows 98.

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Please upgrade your Windows version.

### 13.0.262 Xojo or my RB application itself crashes on launch on Mac OS Classic. Why?

Plugin Version: all, Console & Web: No. **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 prefered to use 50 MB and for an application a 10 MB partition is a good way to start.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>The x value of the data point. For an enumerated x-axis (see Axis.setLabels on what is an enumerated axis), the first data point is 0, and the nth data point is (n-1).</td>
</tr>
<tr>
<td>xLabel</td>
<td>The bottom x-axis label of the data point.</td>
</tr>
<tr>
<td>x2Label</td>
<td>The top x-axis label of the data point.</td>
</tr>
<tr>
<td>value</td>
<td>The value of the data point.</td>
</tr>
<tr>
<td>accValue</td>
<td>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.</td>
</tr>
<tr>
<td>totalValue</td>
<td>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.</td>
</tr>
<tr>
<td>percent</td>
<td>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.</td>
</tr>
<tr>
<td>accPercent</td>
<td>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.</td>
</tr>
<tr>
<td>gpercent</td>
<td>The percentage of the data point based on the total value of all data points in a layer.</td>
</tr>
<tr>
<td>dataSet</td>
<td>The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1).</td>
</tr>
<tr>
<td>dataSetName</td>
<td>The name of the data set to which the data point belongs.</td>
</tr>
<tr>
<td>dataItem</td>
<td>The data point number within the data set. The first data point is 0. The nth data point is (n-1).</td>
</tr>
<tr>
<td>dataGroup</td>
<td>The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1).</td>
</tr>
<tr>
<td>dataGroupName</td>
<td>The name of the data group to which the data point belongs.</td>
</tr>
<tr>
<td>layerId</td>
<td>The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1).</td>
</tr>
<tr>
<td>fieldN</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 LineLayer.setSymbolScale.
zy  The symbol scale in the y dimension. Applicable for layers with symbol scales
set by LineLayer.setSymbolScale.
z  The symbol scale without distinguishing the dimension to use. Applicable for
layers with symbol scales set by LineLayer.setSymbolScale.

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.

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.

dir  The direction of the vector.
len  The length of the vector.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>radius</td>
<td>The radial value of the data point.</td>
</tr>
<tr>
<td>value</td>
<td>Same as { radius }. See above.</td>
</tr>
<tr>
<td>angle</td>
<td>The angular value of the data point.</td>
</tr>
<tr>
<td>x</td>
<td>Same as { angle }. See above.</td>
</tr>
<tr>
<td>label</td>
<td>The angular label of the data point.</td>
</tr>
<tr>
<td>xLabel</td>
<td>Same as { label }. See above.</td>
</tr>
<tr>
<td>name</td>
<td>The name of the layer to which the data point belongs.</td>
</tr>
<tr>
<td>dataSetName</td>
<td>Same as { name }. See above.</td>
</tr>
<tr>
<td>i</td>
<td>The data point number. The first data point is 0. The nth data point is (n-1).</td>
</tr>
<tr>
<td>dataItem</td>
<td>Same as { i }. See above.</td>
</tr>
<tr>
<td>z</td>
<td>The symbol scale. Applicable for layers with symbol scales set by Polar-Layer.setSymbolScale.</td>
</tr>
<tr>
<td>fieldN</td>
<td>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.</td>
</tr>
<tr>
<td>diFieldN</td>
<td>Same as fieldN. See above.</td>
</tr>
<tr>
<td>dsFieldN</td>
<td>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.</td>
</tr>
<tr>
<td>dsdiFieldN</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dir</td>
<td>The direction of the vector.</td>
</tr>
<tr>
<td>len</td>
<td>The length of the vector.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The axis value at the tick position.</td>
</tr>
<tr>
<td>label</td>
<td>The axis label at the tick position.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ param ]</td>
<td>The name of the parameter</td>
</tr>
<tr>
<td>[ a ]</td>
<td>If this field a number, it specifies the number of decimal places (digits to the right of the decimal point).</td>
</tr>
</tbody>
</table>
### Parameter Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>yyyy</td>
<td>The year in 4 digits (e.g. 2002)</td>
</tr>
<tr>
<td>yyy</td>
<td>The year showing only the least significant 3 digits (e.g. 002 for the year 2002)</td>
</tr>
<tr>
<td>yy</td>
<td>The year showing only the least significant 2 digits (e.g. 02 for the year 2002)</td>
</tr>
<tr>
<td>y</td>
<td>The year showing only the least significant 1 digit (e.g. 2 for the year 2002)</td>
</tr>
<tr>
<td>mmm</td>
<td>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.</td>
</tr>
<tr>
<td>mm</td>
<td>The month formatted as 2 digits from 01 - 12, adding leading zero if necessary.</td>
</tr>
<tr>
<td>m</td>
<td>The month formatted using the minimum number of digits from 1 - 12.</td>
</tr>
<tr>
<td>MMM</td>
<td>The first 3 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.</td>
</tr>
<tr>
<td>MM</td>
<td>The first 2 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.</td>
</tr>
<tr>
<td>M</td>
<td>The first character of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.</td>
</tr>
<tr>
<td>dd</td>
<td>The day of month formatted as 2 digits from 01 - 31, adding leading zero if necessary.</td>
</tr>
<tr>
<td>d</td>
<td>The day of month formatted using the minimum number of digits from 1 - 31.</td>
</tr>
<tr>
<td>w</td>
<td>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.</td>
</tr>
<tr>
<td>hh</td>
<td>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.</td>
</tr>
<tr>
<td>h</td>
<td>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.</td>
</tr>
<tr>
<td>nn</td>
<td>The minute formatted as 2 digits from 00 - 59, adding leading zero if necessary.</td>
</tr>
<tr>
<td>n</td>
<td>The minute formatted using the minimum number of digits from 00 - 59.</td>
</tr>
<tr>
<td>ss</td>
<td>The second formatted as 2 digits from 00 - 59, adding leading zero if necessary.</td>
</tr>
<tr>
<td>s</td>
<td>The second formatted using the minimum number of digits from 00 - 59.</td>
</tr>
<tr>
<td>a</td>
<td>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.</td>
</tr>
<tr>
<td>Shape Id</td>
<td>Value</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>SquareShape</td>
<td>1</td>
</tr>
<tr>
<td>DiamondShape</td>
<td>2</td>
</tr>
<tr>
<td>TriangleShape</td>
<td>3</td>
</tr>
<tr>
<td>RightTriangleShape</td>
<td>4</td>
</tr>
<tr>
<td>LeftTriangleShape</td>
<td>5</td>
</tr>
<tr>
<td>InvertedTriangleShape</td>
<td>6</td>
</tr>
<tr>
<td>CircleShape</td>
<td>7</td>
</tr>
<tr>
<td>StarShape</td>
<td></td>
</tr>
<tr>
<td>PolygonShape</td>
<td></td>
</tr>
<tr>
<td>Polygon2Shape</td>
<td></td>
</tr>
<tr>
<td>CrossShape</td>
<td></td>
</tr>
<tr>
<td>Cross2Shape</td>
<td></td>
</tr>
</tbody>
</table>

<p>| 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                                                               |</p>
<table>
<thead>
<tr>
<th>Nan</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Invalid square root (negative number, usually)</td>
</tr>
<tr>
<td>2</td>
<td>Invalid addition (indeterminate such as infinity + (-infinity))</td>
</tr>
<tr>
<td>4</td>
<td>Invalid division (indeterminate such as 0/0)</td>
</tr>
<tr>
<td>8</td>
<td>Invalid multiplication (indeterminate such as 0*infinity)</td>
</tr>
<tr>
<td>9</td>
<td>Invalid modulo such as (a mod 0)</td>
</tr>
<tr>
<td>17</td>
<td>Try to convert invalid string to a number like val(&quot;x7&quot;)</td>
</tr>
<tr>
<td>33</td>
<td>Invalid argument in a trig function</td>
</tr>
<tr>
<td>34</td>
<td>Invalid argument in an inverse trig function</td>
</tr>
<tr>
<td>36</td>
<td>Invalid argument in a log function</td>
</tr>
<tr>
<td>37</td>
<td>Invalid argument in Pow function</td>
</tr>
<tr>
<td>38</td>
<td>Invalid argument in toolbox financial function</td>
</tr>
<tr>
<td>40</td>
<td>Invalid argument in hyperbolic function</td>
</tr>
<tr>
<td>42</td>
<td>Invalid argument in a gamma function</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description and result</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------</td>
</tr>
<tr>
<td>0</td>
<td>Digit placeholder. For example, if the value 8.9 is to be displayed as 8.90, use the format <code># .00</code></td>
</tr>
<tr>
<td>#</td>
<td>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 <code># .# #</code>, and 8.9 is in the cell, the number 8.9 is displayed.</td>
</tr>
<tr>
<td>?</td>
<td>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 <code>0.0?</code> aligns the decimal points for the numbers 8.9 and 88.99 in a column.</td>
</tr>
<tr>
<td>. (period)</td>
<td>Decimal point.</td>
</tr>
<tr>
<td>%</td>
<td>Percentage. If the cell contains a number between 0 and 1, and the custom format <code>0%</code> is used, the application shall multiply the number by 100 and adds the percentage symbol in the cell.</td>
</tr>
<tr>
<td>, (comma)</td>
<td>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 <code># .0</code>, and the cell value is 12,200,000 then the number 12.2 is displayed.</td>
</tr>
<tr>
<td>E- E+ e- e+</td>
<td>Scientific format. The application shall display a number to the right of the &quot;E&quot; symbol that corresponds to the number of places that the decimal point was moved. For example, if the format is <code>0.00E+00</code>, and the value 12,200,000 is in the cell, the number <code>1.22E+07</code> is displayed. If the number format is <code># 0.0E+0</code>, then the number <code>12.2E+6</code> is displayed.</td>
</tr>
<tr>
<td>$ -+/():space</td>
<td>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 <code>(000)</code>, and the value 12 is in the cell, the number (012) is displayed.</td>
</tr>
<tr>
<td>\</td>
<td>Display the next character in the format. The application shall not display the backslash. For example, if the number format is <code>0\!</code>, and the value 3 is in the cell, the value 3! is displayed.</td>
</tr>
<tr>
<td>*</td>
<td>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 <code>0*x</code>, 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.</td>
</tr>
<tr>
<td>_(underline)</td>
<td>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 <code>_(0.0_);(0.0)</code> aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses.</td>
</tr>
<tr>
<td>&quot;text&quot;</td>
<td>Display whatever text is inside the quotation marks. For example, the format <code>0.00 &quot;dollars&quot;</code> displays 1.23 dollars when the value 1.23 is in the cell.</td>
</tr>
<tr>
<td>@</td>
<td>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 &quot;Bob &quot;@&quot; Smith&quot; (including quotation marks), and the value &quot;John&quot; is in the cell, the value Bob John Smith is displayed.</td>
</tr>
<tr>
<td>To display</td>
<td>As</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>Months</td>
<td>1-12</td>
</tr>
<tr>
<td>Months</td>
<td>01-12</td>
</tr>
<tr>
<td>Months</td>
<td>Jan-Dec</td>
</tr>
<tr>
<td>Months</td>
<td>January-December</td>
</tr>
<tr>
<td>Months</td>
<td>J-D</td>
</tr>
<tr>
<td>Days</td>
<td>1-31</td>
</tr>
<tr>
<td>Days</td>
<td>01-31</td>
</tr>
<tr>
<td>Days</td>
<td>Sun-Sat</td>
</tr>
<tr>
<td>Days</td>
<td>Sunday-Saturday</td>
</tr>
<tr>
<td>Years</td>
<td>00-99</td>
</tr>
<tr>
<td>Years</td>
<td>1900-9999</td>
</tr>
<tr>
<td>Hours</td>
<td>0-23</td>
</tr>
<tr>
<td>Hours</td>
<td>00-23</td>
</tr>
<tr>
<td>Minutes</td>
<td>0-59</td>
</tr>
<tr>
<td>Minutes</td>
<td>00-59</td>
</tr>
<tr>
<td>Seconds</td>
<td>0-59</td>
</tr>
<tr>
<td>Seconds</td>
<td>00-59</td>
</tr>
<tr>
<td>Time</td>
<td>4 AM</td>
</tr>
<tr>
<td>Time</td>
<td>4:36 PM</td>
</tr>
<tr>
<td>Time</td>
<td>4:36:03 P</td>
</tr>
<tr>
<td>Time</td>
<td>4:36:03.75</td>
</tr>
<tr>
<td>Elapsed time</td>
<td>1:02</td>
</tr>
<tr>
<td>Elapsed time</td>
<td>62:16</td>
</tr>
<tr>
<td>Elapsed time</td>
<td>3735.80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To display</th>
<th>As</th>
<th>Use this code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234.59</td>
<td>1234.6</td>
<td># # # # :.#</td>
</tr>
<tr>
<td>8.9</td>
<td>8.900</td>
<td># .000</td>
</tr>
<tr>
<td>.631</td>
<td>0.6</td>
<td>0.#</td>
</tr>
<tr>
<td>12</td>
<td>12.0</td>
<td># .0#</td>
</tr>
<tr>
<td>1234.568</td>
<td>1234.57</td>
<td># .0#</td>
</tr>
<tr>
<td>44.398</td>
<td>44.398</td>
<td>??? ???</td>
</tr>
<tr>
<td>102.65</td>
<td>102.65</td>
<td>??? ???</td>
</tr>
<tr>
<td>2.8</td>
<td>2.8</td>
<td>???.??</td>
</tr>
<tr>
<td>5.25</td>
<td>5 1/4</td>
<td># ??/??</td>
</tr>
<tr>
<td>5.3</td>
<td>5 3/10</td>
<td># ??/??</td>
</tr>
<tr>
<td>12000</td>
<td>12,000</td>
<td># , # # #</td>
</tr>
<tr>
<td>12000</td>
<td>12</td>
<td># ,</td>
</tr>
<tr>
<td>12400000</td>
<td>12.4</td>
<td>0.0n</td>
</tr>
</tbody>
</table>