

MBS XML Plugin Documentation

Christian Schmitz

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0.1 Introduction

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

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List of all classes

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Chapter 3

XML

3.1 class XMLAttributeMBS

3.1.1 class XMLAttributeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLAttributeMBS class refers to an attribute of an XML element.

Notes: Typically the allowable values for the attribute are defined in a documenttype definition.

XMLAttributeMBS objects inherit the XMLNodeMBS interface, but since attributes are not actually child nodes of the elements they are associated with, the DOM does not consider them part of the document tree. Thus, the XMLNodeMBS attributes parentNode, previousSibling, and nextSibling have a null value for XMLAttributeMBS objects. The DOM takes the view that attributes are properties of elements rather than having a separate identity from the elements they are associated with; this should make it more efficient to implement such features as default attributes associated with all elements of a given type. Furthermore, attribute nodes may not be immediate children of a DOMDocumentFragment. However, they can be associated with XMLElementMBS nodes contained within a DOMDocumentFragment. In short, users of the DOM need to be aware that XMLAttributeMBS nodes have some things in common with other objects inheriting the XMLNodeMBS interface, but they also are quite distinct.

Subclass of the XMLNodeMBS class.

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

Blog Entries

- [Iterate over XML nodes](#)

Xojo Developer Magazine

- [21.2, page 66: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes](#)

3.1.2 Methods

3.1.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.1.4 Properties

3.1.5 isId as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns whether this attribute is known to be of type ID or not.

Notes: When it is and its value is unique, the ownerElement of this attribute can be retrieved using getElementById on XMLDocumentMBS.

(Read only property)

3.1.6 Name as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the name of this attribute.

Notes: (Read only property)

3.1.7 OwnerElement as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLElementMBS node this attribute is attached to or nil if this attribute is not in use.

Notes: (Read only property)

3.1.8 SchemaTypeInfo as XMLTypeInfoMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the type information associated with this attribute.

Notes: the XMLTypeInfoMBS associated with this attribute.

(Read only property)

3.1.9 Specified as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether this is specified.

Notes: Returns true if the attribute received its value explicitly in the XML document, or if a value was assigned programmatically with the setValue function. Returns false if the attribute value came from the default value declared in the document's DTD.

(Read only property)

3.1.10 Value as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the value of the attribute.

Notes: The value of the attribute is returned as a string. Character and general entity references are replaced with their values.

Assign something to set the value of the attribute. A text node with the unparsed contents of the string will be created.

(Read and Write property)

3.2 class XMLCDATASectionMBS

3.2.1 class XMLCDATASectionMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: CDATA sections are used to escape blocks of text containing characters that would otherwise be regarded as markup.

Notes: The only delimiter that is recognized in a CDATA section is the "]]>" string that ends the CDATA section. CDATA sections cannot be nested. Their primary purpose is for including material such as XML fragments, without needing to escape all the delimiters.

The data attribute of the XMLTextMBS node holds the text that is contained by the CDATA section. Note that this may contain characters that need to be escaped outside of CDATA sections and that, depending on the character encoding ("charset") chosen for serialization, it may be impossible to write out some characters as part of a CDATA section.

The XMLCDATASectionMBS interface inherits from the XMLCharacterDataMBS interface through the XMLTextMBS interface. Adjacent XMLCDATASectionMBS nodes are not merged by use of the normalize method of the XMLNodeMBS interface. Because no markup is recognized within a XMLCDATASectionMBS, character numeric references cannot be used as an escape mechanism when serializing. Therefore, action needs to be taken when serializing a XMLCDATASectionMBS with a character encoding where some of the contained characters cannot be represented. Failure to do so would not produce well-formed XML. One potential solution in the serialization process is to end the CDATA section before the character, output the character using a character reference or entity reference, and open a new CDATA section for any further characters in the text node. Note, however, that some code conversion libraries at the time of writing do not return an error or exception when a character is missing from the encoding, making the task of ensuring that data is not corrupted on serialization more difficult.

Subclass of the XMLTextMBS class.

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

3.2.2 Methods

3.2.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.3 class XMLCharacterDataMBS

3.3.1 class XMLCharacterDataMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for character data.

Notes: The XMLCharacterDataMBS interface extends XMLNodeMBS with a set of attributes and methods for accessing character data in the DOM. For clarity this set is defined here rather than on each object that uses these attributes and methods. No DOM objects correspond directly to XMLCharacterDataMBS, though XMLTextMBS and others do inherit the interface from it. All offsets in this interface start from 0.

As explained in the DOM spec, text strings in the DOM are represented in UTF-16, i.e. as a sequence of 16-bit units. In the following, the term 16-bit units is used whenever necessary to indicate that indexing on XMLCharacterDataMBS is done in 16-bit units.

Subclass of the XMLNodeMBS class.

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

3.3.2 Methods

3.3.3 appendData(data as string)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Append the string to the end of the character data of the node.

Notes: Upon success, data provides access to the concatenation of data.

3.3.4 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.3.5 deleteData(offset as Integer, count as Integer)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Remove a range of characters from the node.

Notes: Upon success, data and length reflect the change.

offset: The offset from which to remove characters. Zero based.

count: The number of characters to delete.

If the sum of offset and count exceeds length then all characters from offset to the end of the data are deleted.

3.3.6 insertData(offset as Integer, data as string)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Insert a string at the specified character offset.

Notes: offset: The character offset at which to insert. Zero based.

3.3.7 replaceData(offset as Integer, count as Integer, data as string)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Replace the characters starting at the specified character offset with the specified string.

Notes: offset: The offset from which to start replacing.

count: The number of characters to replace.

If the sum of offset and count exceeds length, then all characters to the end of the data are replaced (i.e., the effect is the same as a remove method call with the same range, followed by an append method invocation).

3.3.8 substringData(offset as Integer, count as Integer) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Extracts a range of data from the node.

Notes: offset: Start offset of substring to extract. Zero based.

count: The number of characters to extract.

The specified substring. If the sum of offset and count exceeds the length, then all characters to the end of the data are returned.

3.3.9 Properties

3.3.10 Data as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The data content.

Notes: Returns the character data of the node that implements this interface.

The DOM implementation may not put arbitrary limits on the amount of data that may be stored in a XMLCharacterDataMBS node. However, implementation limits may mean that the entirety of a node's data may not fit into a single XMLCh* String. In such cases, the user may call substringData to retrieve the data in appropriately sized pieces.

Can be assigned with new data.

(Read and Write property)

3.3.11 Length as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the number of characters that are available through data and the substringData method below.

Notes: (Read only property)

3.4 class XMLCommentMBS

3.4.1 class XMLCommentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for a comment in a xml document.

Notes: This interface inherits from CharacterData and represents the content of a comment, i.e., all the characters between the starting '<!--' and ending '-->'.
Subclass of the XMLCharacterDataMBS class.

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

3.4.2 Methods

3.4.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.5 class XMLConfigurationMBS

3.5.1 class XMLConfigurationMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLConfigurationMBS interface represents the configuration of a document and maintains a table of recognized parameters.

Notes: Using the configuration, it is possible to change Document.normalizeDocument behavior, such as replacing CDATASection nodes with Text nodes or specifying the type of the schema that must be used when the validation of the Document is requested. XMLConfigurationMBS objects are also used in [DOM Level 3 Load and Save] in the XMLParserMBS and XMLSerializerMBS interfaces.

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

3.5.2 Methods

3.5.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.5.4 Properties

3.5.5 ByteOrderMark as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to include byte order mark byte in output.

Notes: (Read and Write property)

3.5.6 CanonicalForm as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to .

Notes: true: Canonicalize the document according to the rules specified in [Canonical XML] . Note that this is limited to what can be represented in the DOM. In particular, there is no way to specify the order of the attributes in the DOM.

false: (default) Do not canonicalize the document.

(Read and Write property)

3.5.7 CDATASections as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to keep CDATA sections in the document.

Notes: true: (default) Keep CDATASection nodes in the document.

false: Transform CDATASection nodes in the document into Text nodes. The new Text node is then combined with any adjacent Text node.

(Read and Write property)

3.5.8 Comments as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to keep comments.

Notes: true: (default) Keep Comment nodes in the document.

false: Discard Comment nodes in the Document.

(Read and Write property)

3.5.9 DataTypeNormalization as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to perform data type normalization.

Notes: true: Exposed normalized values in the tree.

false: (default) Do not perform normalization on the tree.

(Read and Write property)

3.5.10 DiscardDefaultContent as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to discard default content.

Notes: true: (default) Use whatever information available to the implementation (i.e. XML schema, DTD, the specified flag on Attr nodes, and so on) to decide what attributes and content should be discarded or not. Note that the specified flag on Attr nodes in itself is not always reliable, it is only reliable when it is set to false since the only case where it can be set to false is if the attribute was created by the implementation. The default content won't be removed if an implementation does not have any information available.

false: Keep all attributes and all content.

(Read and Write property)

3.5.11 elementcontentwhitespace as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to keep all white spaces.

Example:

```

Dim parser As New XMLParserMBS

// configure the parser
Dim DOMConfig As XMLConfigurationMBS = p.DOMConfig
DOMConfig.ElementContentWhitespace=False

// prepare XML input
Dim Input As New XMLInputMBS
Input.InputString = kXML2

// and parse
Var xml1 As XMLDocumentMBS = p.parse(Input)

Break

```

Notes: true: (default) Keep all white spaces in the document.

false: Discard white space in element content while normalizing. The implementation is expected to use the `isWhitespaceInElementContent` flag on Text nodes to determine if a text node should be written out or not. (Read and Write property)

3.5.12 Entities as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Keep entities in the document.

Notes: true: Keep EntityReference and Entity nodes in the document.

false: (default) Remove all EntityReference and Entity nodes from the document, putting the entity expansions directly in their place. Text nodes are into "normal" form. Only EntityReference nodes to non-defined entities are kept in the document.

(Read and Write property)

3.5.13 formatprettyprint as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to pretty print XML.

Notes: For serializing XML.

Formatting the output by adding whitespace to produce a pretty-printed, indented, human-readable form. The exact form of the transformations is not specified by this specification.

Pretty-printing changes the content of the document and may affect the validity of the document, validating implementations should preserve validity.

(Read and Write property)

3.5.14 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.5.15 ignoreunknowncharacterdenormalizations as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to ignore unknown character normalizations.

Notes: For serializing XML.

If, while verifying full normalization when [XML 1.1] is supported, a character is encountered for which the normalization properties cannot be determined, then raise a "unknown-character-denormalization" warning (instead of raising an error, if this parameter is not set) and ignore any possible denormalizations caused by these characters.

Set to false to report a fatal error if a character is encountered for which the processor cannot determine the normalization properties.

(Read and Write property)

3.5.16 InfoSet as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to only keep the information defined in the XML Information Set.

Notes: true: Only keep in the document the information defined in the XML Information Set [XML Information set]. This forces the following features to false: namespace-declarations, validate-if-schema, entities, datatype-normalization, cdata-sections. This forces the following features to true: whitespace-in-element-content, comments, namespaces. Other features are not changed unless explicitly specified in the description of the features. Note that querying this feature with `getFeature` returns true only if the individual features specified above are appropriately set.

false: Setting `infoset` to false has no effect.

(Read and Write property)

3.5.17 namespacedeclarations as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to include namespace declaration attributes.

Notes: true: (default) Include namespace declaration attributes, specified or defaulted from the schema or the DTD, in the document. See also the section Declaring Namespaces in [XML Namespaces] .

false: Discard all namespace declaration attributes. The Namespace prefixes are retained even if this feature is set to false.

(Read and Write property)

3.5.18 NameSpaces as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to do namespace processing.

Notes: true: (default) Perform the namespace processing as defined in [XML Namespaces] .

false: Do not perform the namespace processing.

(Read and Write property)

3.5.19 normalizecharacters as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to do character normalization.

Notes: true: Perform the W3C Text Normalization of the characters [CharModel] in the document.

false: (default) Do not perform character normalization.

(Read and Write property)

3.5.20 SpaceFirstLevelElements as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to space first level elements for pretty print.

Notes: If true, this adds an extra line feed between the elements that are children of the document root.

(Read and Write property)

3.5.21 splitcdatasections as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to split the CData Sections.

Notes: true: (default) Split CDATA sections containing the CDATA section termination marker ']] >'. When a CDATA section is split a warning is issued.

false: Signal an error if a CDATASection contains an unrepresentable character.
(Read and Write property)

3.5.22 Validate as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to validate against a schema.

Notes: true: Require the validation against a schema (i.e. XML schema, DTD, any other type or representation of schema) of the document as it is being normalized as defined by [XML 1.0] . If validation errors are found, or no schema was found, the error handler is notified. Note also that normalized values will not be exposed to the schema in used unless the feature datatype-normalization is true.

Note: validate-if-schema and validate are mutually exclusive, setting one of them to true will set the other one to false.

false: (default) Only XML 1.0 non-validating processing must be done. Note that validation might still happen if validate-if-schema is true.

(Read and Write property)

3.5.23 validateifschema as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to validate only if a declaration for the document element can be found.

Notes: true: Enable validation only if a declaration for the document element can be found (independently of where it is found, i.e. XML schema, DTD, or any other type or representation of schema). If validation errors are found, the error handler is notified. Note also that normalized values will not be exposed to the schema in used unless the feature datatype-normalization is true.

Note: validate-if-schema and validate are mutually exclusive, setting one of them to true will set the other one to false.

false: (default) No validation should be performed if the document has a schema. Note that validation must still happen if validate is true.

(Read and Write property)

3.5.24 xmldeclaration as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to include declaration.

Notes: For serializing XML.

If a XMLDocumentMBS, XMLElementMBS, or XMLEntityMBS node is serialized, the XML declaration, or text declaration, should be included. The version (xmlVersion if the document is a Level 3 document and the version is non-null, otherwise use the value "1.0"), and the output encoding (see write methods for details on how to find the output encoding) are specified in the serialized XML declaration.

Do not serialize the XML and text declarations. Report a "xml-declaration-needed" warning if this will cause problems (i.e. the serialized data is of an XML version other than [XML 1.0], or an encoding would be needed to be able to re-parse the serialized data).

(Read and Write property)

3.6 class XMLDocumentFragmentMBS

3.6.1 class XMLDocumentFragmentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: XMLDocumentFragmentMBS is a "lightweight" or "minimal" XMLDocumentMBS object.

Notes: It is very common to want to be able to extract a portion of a document's tree or to create a new fragment of a document. Imagine implementing a user command like cut or rearranging a document by moving fragments around. It is desirable to have an object which can hold such fragments and it is quite natural to use a XMLNodeMBS for this purpose. While it is true that a XMLDocumentMBS object could fulfill this role, a XMLDocumentMBS object can potentially be a heavyweight object, depending on the underlying implementation. What is really needed for this is a very lightweight object. XMLDocumentFragmentMBS is such an object.

Furthermore, various operations – such as inserting nodes as children of another XMLNodeMBS – may take XMLDocumentFragmentMBS objects as arguments; this results in all the child nodes of the XMLDocumentFragmentMBS being moved to the child list of this node.

The children of a XMLDocumentFragmentMBS node are zero or more nodes representing the tops of any sub-trees defining the structure of the document. XMLDocumentFragmentMBS nodes do not need to be well-formed XML documents (although they do need to follow the rules imposed upon well-formed XML parsed entities, which can have multiple top nodes). For example, a XMLDocumentFragmentMBS might have only one child and that child node could be a XMLTextMBS node. Such a structure model represents neither an HTML document nor a well-formed XML document.

When a XMLDocumentFragmentMBS is inserted into a XMLDocumentMBS (or indeed any other XMLNodeMBS that may take children) the children of the XMLDocumentFragmentMBS and not the XMLDocumentFragmentMBS itself are inserted into the XMLNodeMBS. This makes the XMLDocumentFragmentMBS very useful when the user wishes to create nodes that are siblings; the XMLDocumentFragmentMBS acts as the parent of these nodes so that the user can use the standard methods from the XMLNodeMBS interface, such as insertBefore() and appendChild().

Subclass of the XMLNodeMBS class.

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

3.6.2 Methods

3.6.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.7 class XMLDocumentMBS

3.7.1 class XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLDocumentMBS interface represents the entire XML document.

Example:

```
// parse it
dim doc as new XMLDocumentMBS("<test id=123>abc</test>")

// and make a string:
dim s as string = doc.toString

Break // see in debugger
```

Notes: Conceptually, it is the root of the document tree, and provides the primary access to the document's data.

Since elements, text nodes, comments, processing instructions, etc. cannot exist outside the context of a XMLDocumentMBS, the XMLDocumentMBS interface also contains the factory methods needed to create these objects. The XMLNodeMBS objects created have a ownerDocument attribute which associates them with the XMLDocumentMBS within whose context they were created.

All methods can raise a XMLExceptionMBS object in case of a problem.
Subclass of the XMLNodeMBS class.

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3.7.2 Methods

3.7.3 `adoptNode(node as XMLNodeMBS) as XMLNodeMBS`

Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Changes the ownerDocument of a node, its children, as well as the attached attribute nodes if there are any.

Notes: If the node has a parent it is first removed from its parent child list. This effectively allows moving a subtree from one document to another.

Should not be needed in Xojo apps.

3.7.4 `ClearCache`

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Frees the node cache for this document.

Notes: You should usually not need to use this method.

3.7.5 `Close`

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Explicitly close document.

Notes: This frees memory for all nodes and the XML document now.

You should usually not need to use this method.

3.7.6 `Constructor`

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor to create a blank document.

Example:

```
// create blank document
dim doc as new XMLDocumentMBS

dim testNode as XMLElementMBS = doc.createElement("test")

System.DebugLog "doc.append"
call doc.appendChild testNode

System.DebugLog "testNode.append"
call testNode.appendChild doc.createTextNode("Hello World")

// and make a string:
dim s as string = doc.toString

Break // see in debugger
```

See also:

- 3.7.7 Constructor(data as MemoryBlock) 33
- 3.7.8 Constructor(data as String) 34
- 3.7.9 Constructor(file as FolderItem) 34
- 3.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 34

3.7.7 Constructor(data as MemoryBlock)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Convenience function to parse a document from a memoryblock.

See also:

- 3.7.6 Constructor 32
- 3.7.8 Constructor(data as String) 34
- 3.7.9 Constructor(file as FolderItem) 34
- 3.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 34

3.7.8 Constructor(data as String)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Convenience function to parse a document from a string.

Example:

```
// parse it
dim doc as new XMLDocumentMBS("<test id=123>abc</test>")
```

```
// and make a string:
dim s as string = doc.toString
```

Break // see in debugger

See also:

- 3.7.6 Constructor 32
- 3.7.7 Constructor(data as MemoryBlock) 33
- 3.7.9 Constructor(file as FolderItem) 34
- 3.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 34

3.7.9 Constructor(file as FolderItem)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Initializes by loading an XML file.

See also:

- 3.7.6 Constructor 32
- 3.7.7 Constructor(data as MemoryBlock) 33
- 3.7.8 Constructor(data as String) 34
- 3.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 34

3.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a DOMDocument object of the specified type with its document element.

Notes: namespaceURI: The namespace URI of the document element to create.

3.7. CLASS XMLDOCUMENTMBS 35

qualifiedName: The qualified name of the document element to be created.

DocumentType: The type of document to be created or nil. When doctype is not nil, its ownerDocument attribute is set to the document being created.

See also:

- 3.7.6 Constructor 32
- 3.7.7 Constructor(data as MemoryBlock) 33
- 3.7.8 Constructor(data as String) 34
- 3.7.9 Constructor(file as FolderItem) 34

3.7.11 Create as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a blank document.

See also:

- 3.7.12 Create(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) as XMLDocumentMBS 35

3.7.12 Create(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a DOMDocument object of the specified type with its document element.

Notes: namespaceURI: The namespace URI of the document element to create.

qualifiedName: The qualified name of the document element to be created.

DocumentType: The type of document to be created or nil. When doctype is not nil, its ownerDocument attribute is set to the document being created.

Returns a new XMLDocumentMBS object.

See also:

- 3.7.11 Create as XMLDocumentMBS 35

3.7.13 createAttribute(Name as String) as XMLAttributeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an XMLAttributeMBS of the given name.

Notes: Note that the XMLAttributeMBS instance can then be set on an XMLElementMBS using the setAttributeNode method.
To create an attribute with a qualified name and namespace URI, use the

createAttributeNS method.

name: The name of the attribute.

Returns a new XMLAttributeMBS object with the nodeName attribute set to name, and localName, prefix, and namespaceURI set to "". The value of the attribute is the empty string.

3.7.14 createAttributeNS(namespaceURI as String, qualifiedName as String) as XMLAttributeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an attribute of the given qualified name and namespace URI.

Notes: namespaceURI: The namespace URI of the attribute to create.

qualifiedName: The qualified name of the attribute to instantiate.

3.7.15 createCDATASection(Data as String) as XMLCDATASectionMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a XMLCDATASectionMBS node whose value is the specified string.

3.7.16 createComment(Text as String) as XMLCommentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a DOMComment node given the specified string.

3.7.17 createDocumentFragment as XMLDocumentFragmentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an empty XMLDocumentFragmentMBS object.

3.7.18 createDocumentType(Name as String, PublicID as String = "", SystemID as String = "") as XMLDocumentTypeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Create a XMLDocumentTypeMBS node.

3.7.19 createElement(Name as String) as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an element of the type specified.

Example:

```
Dim doc As New XMLDocumentMBS
```

```
Dim testNode As XMLElementMBS = doc.createElement("test")
```

```
Call doc.appendChild testNode
```

```
MessageBox doc.toString
```

Notes: Note that the instance returned implements the XMLElementMBS interface, so attributes can be specified directly on the returned object.

In addition, if there are known attributes with default values, XMLAttributeMBS nodes representing them are automatically created and attached to the element.

To create an element with a qualified name and namespace URI, use the createElementNS method.

tagName The name of the element type to instantiate. For XML, this is case-sensitive.

A new XMLElementMBS object with the nodeName attribute set to tagName, and localName, prefix, and namespaceURI set to "".

3.7.20 createElementNS(namespaceURI as String, qualifiedName as String) as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an element of the given qualified name and namespace URI.

Notes: namespaceURI: The namespace URI of the element to create.

qualifiedName: The qualified name of the element type to instantiate.

3.7.21 createEntity(Name as String) as XMLEntityMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Create a new entity.

Notes: name: The name of the entity to instantiate.

3.7.22 createEntityReference(Text as String) as XMLEntityReferenceMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an XMLEntityReferenceMBS object.

Notes: In addition, if the referenced entity is known, the child list of the XMLEntityReferenceMBS node is made the same as that of the corresponding XMLEntityMBS node. If any descendant of the XMLEntityMBS node has an unbound namespace prefix, the corresponding descendant of the created XMLEntityReferenceMBS node is also unbound; (its namespaceURI is nil). The DOM Level 2 does not support any mechanism to resolve namespace prefixes.

name: The name of the entity to reference.

Returns the new XMLEntityReferenceMBS object.

3.7.23 createNodeIterator(root as XMLNodeMBS = nil, whatToShow as Integer = &hFFFF, entityReferenceExpansion as boolean = false, filter as XMLNodeFilterMBS = nil) as XMLNodeIteratorMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a NodeIterator object.

Notes: NodeIterators are used to step through a set of nodes, e.g. the set of nodes in a NodeList, the document subtree governed by a particular node, the results of a query, or any other set of nodes. The set of nodes to be iterated is determined by the implementation of the NodeIterator. DOM Level 2 specifies a single NodeIterator implementation for document-order traversal of a document subtree. Instances of these iterators are created by calling createNodeIterator().

To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the whatToShow flags to hide the entity reference node and set expandEntityReferences to true when creating the iterator. To produce a view of the document that has entity reference nodes but no entity expansion, use the whatToShow flags to show the entity reference node and set expandEntityReferences to false.

root: The root node of the DOM tree

whatToShow: This attribute determines which node types are presented via the iterator.

filter: The filter used to screen nodes .

entityReferenceExpansion: The value of this flag determines whether the children of entity reference nodes are visible to the iterator. If false, they will be skipped over.

3.7.24 createNotation(Name as String) as XMLNotationMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Create a Notation.

Notes: name: The name of the notation to instantiate

Returns a XMLNotationMBS that references the newly created XMLNotationMBS node.

3.7.25 createProcessingInstruction(Target as String, Data as string) as XML-CDATASectionMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a XMLProcessingInstructionMBS node given the specified name and data strings.

Notes: target: The target part of the processing instruction.

data: The data for the node.

3.7.26 createTextNode(Text as String) as XMLTextMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a XMLTextMBS node given the specified string.

Example:

```
Dim doc As New XMLDocumentMBS
```

```
Dim element As XMLElementMBS = doc.createElement("test")
```

```
Call doc.appendChild element
```

```
Call element.appendChild doc.createTextNode("Hello World")
```

```
MessageBox doc.toString
```

3.7.27 createTreeWalker(root as XMLNodeMBS = nil, whatToShow as Integer = &hFFFF, entityReferenceExpansion as boolean = false, filter as XMLNodeFilterMBS = nil) as XMLTreeWalkerMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a TreeWalker object.

Notes: TreeWalker objects are used to navigate a document tree or subtree using the view of the document defined by its whatToShow flags and any filters that are defined for the TreeWalker. Any function which

performs navigation using a `TreeWalker` will automatically support any view defined by a `TreeWalker`.

Omitting nodes from the logical view of a subtree can result in a structure that is substantially different from the same subtree in the complete, unfiltered document. Nodes that are siblings in the `TreeWalker` view may be children of different, widely separated nodes in the original view. For instance, consider a `Filter` that skips all nodes except for `XMLTextMBS` nodes and the root node of a document. In the logical view that results, all text nodes will be siblings and appear as direct children of the root node, no matter how deeply nested the structure of the original document.

To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the `whatToShow` flags to hide the entity reference node and set `expandEntityReferences` to `true` when creating the `TreeWalker`. To produce a view of the document that has entity reference nodes but no entity expansion, use the `whatToShow` flags to show the entity reference node and set `expandEntityReferences` to `false`.

`root`: The root node of the DOM tree

`whatToShow`: This attribute determines which node types are presented via the tree-walker.

`filter`: The filter used to screen nodes

`entityReferenceExpansion`: The value of this flag determines whether the children of entity reference nodes are visible to the tree-walker. If `false`, they will be skipped over.

3.7.28 `ElementsByTagName(TagName as String) as XMLElementMBS()`

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns an array of all the `XMLElementMBS(s)` with a given local name and namespace URI in the order in which they are encountered in a preorder traversal of the `XMLDocumentMBS` tree.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim doc As New XMLDocumentMBS(xml)
```

```
Dim elements() As XMLElementMBS = doc.ElementsByTagName("f")
```

Break

Notes: `TagName`: The tag name of the elements to match on. The special value `"*"` matches all local names.

Returns a new array object containing all the matched `XMLElementMBS(s)`.

3.7.29 ElementsByTagNameNS(namespaceURI as string, localName as String) as XMLElementMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns an array of all the XMLElementMBS(s) with a given local name and namespace URI in the order in which they are encountered in a preorder traversal of the XMLDocumentMBS tree.

Notes: namespaceURI: The namespace URI of the elements to match on. The special value "*" matches all namespaces.

localName: The local name of the elements to match on. The special value "*" matches all local names.

Returns a new array object containing all the matched XMLElementMBS(s).

3.7.30 evaluate(expression as String, contextNode as XMLNodeMBS, type as Integer) as XMLXPathResultMBS

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Evaluates an XPath expression string and returns a result of the specified type if possible.

Notes: expression: The XPath expression string to be parsed and evaluated.

contextNode: The context is context node for the evaluation of this XPath expression. Must be owned by the same document and must be a XMLDocumentMBS, XMLElementMBS, XMLAttributeMBS, XMLTextMBS, XMLCDATASectionMBS, DOMComment, XMLProcessingInstructionMBS, or XPathNamespace node.

type: If a specific type is specified, then the result will be returned as the corresponding type. This must be one of the codes of the XMLXPathResultMBS clas constants.

Retruns result of the evaluation of the XPath expression as XMLXPathResultMBS class.

Raises exception if the expression is not legal according to the rules of the DOMXPathEvaluator.

Raises exception if the result cannot be converted to return the specified type.

3.7.31 getElementById(elementId as String) as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the XMLElementMBS whose ID is given by elementId.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1"">abc</test><test id=""2"">def</test></doc>")
```

```
// we mark this id attribute to be the id
```

```
Dim d1 As XMLElementMBS = doc.DocumentElement.FirstElementChild
```

```
Call d1.SetIdAttribute("id", True)
```

```
// now search for it
```

```
Dim element1 As XMLElementMBS = doc.getElementById("1")
```

```
Dim element2 As XMLElementMBS = doc.getElementById("2") // not marked!
```

```
Break
```

Notes: If no such element exists, returns nil.

Behavior is not defined if more than one element has this ID. The DOM implementation must have information that says which attributes are of type ID. Attributes with the name "ID" are not of type ID unless so defined. Implementations that do not know whether attributes are of type ID or not are expected to return nil.

elementId: The unique id value for an element.

Returns the matching element.

3.7.32 importNode(node as XMLNodeMBS) as XMLNodeMBS

Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Imports a node from another document by cloning it to the current document.

Notes: You don't need to do this manually as the plugin will do it for you in methods as appendChild, replaceChild and insertBefore.

3.7.33 IterateElementsByTagName(TagName as String) as XMLIterateElementsMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the elements with matching tag name.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1"">abc</test><test id=""2"">def</test></doc>")
```

```
For Each e As XMLElementMBS In doc.IterateElementsByTagName("test")
```

```
  MessageBox e.toString
```

```
Next
```

Notes: For use with For Each Loops in Xojo.

3.7.34 IterateElementsByTagNameNS(namespaceURI as string, localName as String) as XMLIterateElementsMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the elements with matching tag name.

Notes: For use with For Each Loops in Xojo.

3.7.35 LoadXml(data as MemoryBlock)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Loads XML from data.

Notes: Replaces current document with the new one.

See also:

- 3.7.36 LoadXml(data as String) 43
- 3.7.37 LoadXml(file as FolderItem) 43

3.7.36 LoadXml(data as String)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Loads xml from data.

Notes: Replaces current document with the new one.

See also:

- 3.7.35 LoadXml(data as MemoryBlock) 43
- 3.7.37 LoadXml(file as FolderItem) 43

3.7.37 LoadXml(file as FolderItem)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Loads xml file.

Notes: Replaces current document with the new one.

This may reference other files in same folder.

See also:

- 3.7.35 LoadXml(data as MemoryBlock) 43
- 3.7.36 LoadXml(data as String) 43

3.7.38 LoadXmlMT(data as MemoryBlock)

Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Loads XML from data.

Notes: Replaces current document with the new one.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 3.7.39 LoadXmlMT(data as String) 44
- 3.7.40 LoadXmlMT(file as FolderItem) 44

3.7.39 LoadXmlMT(data as String)

Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Loads xml from data.

Notes: Replaces current document with the new one.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 3.7.38 LoadXmlMT(data as MemoryBlock) 44
- 3.7.40 LoadXmlMT(file as FolderItem) 44

3.7.40 LoadXmlMT(file as FolderItem)

Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Loads xml file.

Notes: Replaces current document with the new one.

This may reference other files in same folder.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 3.7.38 LoadXmlMT(data as MemoryBlock) 44

- 3.7.39 LoadXmlMT(data as String)

3.7.41 NodeFromHandle(Handle as Integer) as XMLNodeMBS

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates a node (or subclass) object based on a handle.

Notes: Raises exception if this handle doesn't belong to this document.

3.7.42 normalizeDocument

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Normalizes the document.

Notes: This method acts as if the document was going through a save and load cycle, putting the document in a "normal" form. The actual result depends on the features being set. See XMLConfigurationMBS for details.

Noticeably this method normalizes XMLTextMBS nodes, makes the document "namespace wellformed", according to the algorithm described below in pseudo code, by adding missing namespace declaration attributes and adding or changing namespace prefixes, updates the replacement tree of XMLEntityReferenceMBS nodes, normalizes attribute values, etc. `
` Mutation events, when supported, are generated to reflect the changes occurring on the document. Note that this is a partial implementation. Not all the required features are implemented. Currently XMLAttributeMBS and XMLTextMBS nodes are normalized. Features to remove XMLCommentMBS and XMLCDATASectionMBS work.

3.7.43 renameNode(node as XMLNodeMBS, namespaceURI as String, qualifiedName as String) as XMLNodeMBS

Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Rename an existing node.

Notes: When possible this simply changes the name of the given node, otherwise this creates a new node with the specified name and replaces the existing node with the new node as described below. This only applies to nodes of type ELEMENT_NODE and ATTRIBUTE_NODE.

When a new node is created, the following operations are performed: the new node is created, any registered event listener is registered on the new node, any user data attached to the old node is removed from that node, the old node is removed from its parent if it has one, the children are moved to the new node, if the renamed node is an XMLElementMBS its attributes are moved to the new node, the new node is inserted at the position the old node used to have in its parent's child nodes list if it has one, the user data that was attached to the old node is attach to the new node, the user data event NODE_RENAMED is fired.

When the node being renamed is an `XMLAttributeMBS` that is attached to an `XMLElementMBS`, the node is first removed from the `XMLElementMBS` attributes map. Then, once renamed, either by modifying the existing node or creating a new one as described above, it is put back.

node: The node to rename.

namespaceURI: The new namespaceURI.

qualifiedName: The new qualified name.

3.7.44 Properties

3.7.45 DocType as XMLDocumentTypeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries the document type.

Notes: The Document Type Declaration (see `XMLDocumentTypeMBS`) associated with this document. For XML documents without a document type declaration this returns nil.

The DOM Level 2 does not support editing the Document Type Declaration. `docType` cannot be altered in any way, including through the use of methods inherited from the `XMLNodeMBS` interface, such as `insertNode` or `removeNode`.

(Read only property)

3.7.46 DocumentElement as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This is a convenience attribute that allows direct access to the child node that is the root element of the document.

Notes: (Read only property)

3.7.47 DocumentURI as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The location of the document or "" if undefined.

Notes: Beware that when the `XMLDocumentMBS` supports the feature "HTML", the href attribute of the HTML BASE element takes precedence over this attribute.

(Read and Write property)

3.7.48 DOMConfig as XMLConfigurationMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The configuration used when normalizeDocument is invoked.

Notes: (Read only property)

3.7.49 InputEncoding as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The input encoding.

Example:

```
Dim xml As String
```

```
xml = "<?xml version='1.0' encoding='ISO-8859-1'?>" + _
EndOfLine.UNIX + _
"<doc><test>tr√$nen/°berstr√mt</test></doc>"
```

```
// make sure the variable has the encoding declared above!
```

```
xml = ConvertEncoding(xml, encodings.ISOLatin1)
```

```
Dim doc As New XMLDocumentMBS(xml)
```

```
MessageBox doc.InputEncoding
```

Notes: An attribute specifying the encoding used for this document at the time of the parsing. This is "" when it is not known, such as when the XMLDocumentMBS was created in memory.

(Read only property)

3.7.50 StrictErrorChecking as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether errors checking is enforced or not

Notes: An attribute specifying whether errors checking is enforced or not. When set to false, the implementation is free to not test every possible error case normally defined on DOM operations, and not raise any XMLExceptionMBS. In case of error, the behavior is undefined. This attribute is true by defaults.

(Read and Write property)

3.7.51 XmlEncoding as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: An attribute specifying, as part of the XML declaration, the encoding of this document.

Notes: This is "" when unspecified or when it is not known, such as when the XMLDocumentMBS was created in memory.

(Read only property)

3.7.52 XmlStandalone as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether this is a standalone document.

Notes: An attribute specifying, as part of the XML declaration, whether this document is standalone. This is false when unspecified.

(Read and Write property)

3.7.53 XmlVersion as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: An attribute specifying, as part of the XML declaration, the version number of this document.

Notes: This is "" when unspecified.

(Read and Write property)

3.7.54 Constants

Show Values

Constant	Value	Description
ShowAll	&hFFFF	Show all XMLNodeMBS(s).
ShowAttribute	2	Show XMLAttributeMBS nodes. This is meaningful only when creating an XMLNodeIteratorMBS or XMLTreeWalkerMBS with an attribute node as its root; in this case, it means that the attribute node will appear in the first position of the iteration or traversal. Since attributes are never children of other nodes, they do not appear when traversing over the document tree.
ShowCDATASection	8	Show XMLCDATASectionMBS nodes.
ShowComment	&h80	Show DOMComment nodes.
ShowDocument	&h100	Show XMLDocumentMBS nodes.
ShowDocumentFragment	&h400	Show XMLDocumentFragmentMBS nodes.
ShowDocumentType	&h200	Show XMLDocumentTypeMBS nodes.
ShowElement	1	Show XMLElementMBS nodes.
ShowEntity	&h20	Show XMLEntityMBS nodes. This is meaningful only when creating an XMLNodeIteratorMBS or XMLTreeWalkerMBS with an XMLEntityMBS node as its root; in this case, it means that the XMLEntityMBS node will appear in the first position of the traversal. Since entities are not part of the document tree, they do not appear when traversing over the document tree.
ShowEntityReference	&h10	Show XMLEntityReferenceMBS nodes.
ShowNotation	&h800	Show XMLNotationMBS nodes. This is meaningful only when creating an XMLNodeIteratorMBS or XMLTreeWalkerMBS with a XMLNotationMBS node as its root; in this case, it means that the XMLNotationMBS node will appear in the first position of the traversal. Since notations are not part of the document tree, they do not appear when traversing over the document tree.
ShowProcessingInstruction	&h40	Show XMLProcessingInstructionMBS nodes.
ShowText	4	Show XMLTextMBS nodes.

3.8 class XMLDocumentTypeMBS

3.8.1 class XMLDocumentTypeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for a document type.

Notes: Each XMLDocumentMBS has a doctype attribute whose value is either nil or a XMLDocumentTypeMBS object. The XMLDocumentTypeMBS interface in the DOM Core provides an interface to the list of entities that are defined for the document, and little else because the effect of namespaces and the various XML schema efforts on DTD representation are not clearly understood as of this writing.

The DOM Level 2 doesn't support editing XMLDocumentTypeMBS nodes.

Subclass of the XMLNodeMBS class.

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

3.8.2 Methods

3.8.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.8.4 Entities as XMLEntityMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: A array containing the general entities, both external and internal, declared in the DTD. Parameter entities are not contained.

Notes: Duplicates are discarded. For example in: `<!DOCTYPE
ex SYSTEM "ex.dtd" [<!ENTITY foo "foo"><!ENTITY bar
"bar"><!ENTITY bar "bar2"><!ENTITY % baz "baz">
] ><ex/>`

the interface provides access to foo and the first declaration of bar but not the second declaration of bar or baz. Every node in this map also implements the XMLEntityMBS interface.

The DOM Level 2 does not support editing entities, therefore entities cannot be altered in any way.

3.8.5 Notations as XMLNotationMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries array of notations.

Notes: A named node map containing the notations declared in the DTD. Duplicates are discarded. Every node in this map also implements the XMLNotationMBS interface.

The DOM Level 2 does not support editing notations, therefore notations cannot be altered in any way.

3.8.6 Properties

3.8.7 InternalSubset as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal subset as a string, or empty if there is none.

Notes: This does not contain the delimiting square brackets. The actual content returned depends on how much information is available to the implementation. This may vary depending on various parameters, including the XML processor used to build the document.

(Read only property)

3.8.8 Name as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The name of DTD; i.e., the name immediately following the DOCTYPE keyword.

Notes: (Read only property)

3.8.9 PublicId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Get the public identifier of the external subset.

Notes: (Read only property)

3.8.10 SystemId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Get the system identifier of the external subset.

Notes: (Read only property)

3.9 class XMLDOMParserMBS

3.9.1 class XMLDOMParserMBS

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class to customize the parser and run it.

Example:

```
Dim xml As String = "<test id=""123"">abc</test>"
Dim parser As New XMLDOMParserMBS
```

```
Parser.ExitOnFirstFatalError = True
parser.DoNamespaces = True
parser.DoSchema = true
```

```
// parse it
Dim doc As XMLDocumentMBS = Parser.Parse(xml)
// and make a string:
Dim s As String = doc.toString
```

Break

Notes: This class wraps XercesDOMParser.

This class implements the Document Object Model (DOM) interface. It should be used by applications which choose to parse and process the XML document using the DOM api's. This implementation also allows the applications to install an error and an entity handler (useful extensions to the DOM specification).

It can be used to instantiate a validating or non-validating parser, by setting a member flag.

Blog Entries

- [News from the MBS Xojo Plugins in Version 23.0](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0](#)
- [MBS Xojo Plugins, version 22.6pr1](#)

Xojo Developer Magazine

- [21.3, page 10: News](#)
- [21.2, page 9: News](#)

3.9.2 Methods

3.9.3 Constructor

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.9.4 Parse(data as MemoryBlock) as XMLDocumentMBS

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Parses a XML in MemoryBlock.

Notes: Returns new document on success.

See also:

- 3.9.5 Parse(data as string) as XMLDocumentMBS

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3.9.5 Parse(data as string) as XMLDocumentMBS

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Parses a XML string.

Example:

```
Dim xml As String = "<test id=""123"">abc</test>"
Dim parser As New XMLDOMParserMBS
```

```
// parse it
Dim doc As XMLDocumentMBS = Parser.Parse(xml)
// and make a string:
Dim s As String = doc.toString
```

Break

Notes: Returns new document on success.

See also:

- 3.9.4 Parse(data as MemoryBlock) as XMLDocumentMBS

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3.9.6 Reset

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Reset the parser.

Notes: This method resets the state of the DOM driver and makes it ready for a fresh parse run.

3.9.7 Properties

3.9.8 CreateEntityReferenceNodes as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Set the 'include entity references' flag.

Notes: This method allows the user to specify whether the parser should create entity reference nodes in the DOM tree being produced. When the 'create' flag is true, the parser will create EntityReference nodes in the DOM tree.

The EntityReference nodes and their child nodes will be read-only.

When the 'create' flag is false, no EntityReference nodes will be created.

The replacement text of the entity is included in either case, either as a child of the Entity Reference node or in place at the location of the reference.

The default value is 'true'.

(Read and Write property)

3.9.9 DoNamespaces as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The 'do namespaces' flag

Notes: This method allows users to enable or disable the parser's namespace processing. When set to true, parser starts enforcing all the constraints and rules specified by the NameSpace specification.

The parser's default state is: false.

(Read and Write property)

3.9.10 DoSchema as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The 'do schema' flag.

Notes: This method allows users to enable or disable the parser's schema processing. When set to false, parser will not process any schema found.

The parser's default state is: false.

Note: If set to true, namespace processing must also be turned on.
(Read and Write property)

3.9.11 ExitOnFirstFatalError as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Set the 'exit on first error' flag.

Notes: This method allows users to set the parser's behaviour when it encounters the first fatal error. If set to true, the parser will exit at the first fatal error. If false, then it will report the error and continue processing.

The default value is 'true' and the parser exits on the first fatal error.
(Read and Write property)

3.9.12 ExternalSchemaLocation as String

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This method allows the user to specify a list of schemas to use.

Notes: If the targetNamespace of a schema specified using this method matches the targetNamespace of a schema occurring in the instance document in the schemaLocation attribute, or if the targetNamespace matches the namespace attribute of the "import" element, the schema specified by the user using this method will be used (i.e., the schemaLocation attribute in the instance document or on the "import" element will be effectively ignored).

The syntax is the same as for schemaLocation attributes in instance documents: e.g, "http://www.example.com file_name.xsd". The user can specify more than one XML Schema in the list.
(Read and Write property)

3.9.13 GenerateSyntheticAnnotations as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Set the 'generate synthetic annotations' flag.

Notes: A synthetic XSAnnotation is created when a schema component has non-schema attributes but has no child annotations so that the non-schema attributes can be recovered under PSVI.
(Read and Write property)

3.9.14 Handle as Integer

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.9.15 IdentityConstraintChecking as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This method allows users to enable or disable the parser's identity constraint checks.

Notes: By default, the parser does identity constraint checks.

The default value is true.

(Read and Write property)

3.9.16 IncludeIgnorableWhitespace as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Set the 'include ignorable whitespace' flag

Notes: This method allows the user to specify whether a validating parser should include ignorable whitespaces as text nodes. It has no effect on non-validating parsers which always include non-markup text.

When set to true (also the default), ignorable whitespaces will be added to the DOM tree as text nodes. The method `DOMText.isIgnorableWhitespace()` will return true for those text nodes only.

When set to false, all ignorable whitespace will be discarded and no text node is added to the DOM tree. Note: applications intended to process the "xml:space" attribute should not set this flag to false.

And this flag also overrides any schema datatype whitespace facets, that is, all ignorable whitespace will be discarded even though 'preserve' is set in schema datatype whitespace facets.

(Read and Write property)

3.9.17 Threaded as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether to run Parse threaded.

Notes: If true, the parsing is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

(Read only property)

3.9.18 ValidateAnnotations as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The 'validate annotations' flag.

Notes: The value for specifying whether Annotations should be validated or not.
(Read and Write property)

3.9.19 ValidationConstraintFatal as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The parser's behaviour when it encounters a validation constraint error.

Notes: If set to true, and the the parser will treat validation error as fatal and will exit depends on the state of "getExitOnFirstFatalError". If false, then it will report the error and continue processing.

Note: setting this true does not mean the validation error will be printed with the word "Fatal Error". It is still printed as "Error", but the parser will exit if "setExitOnFirstFatalError" is set to true.

The default value is 'false'.

(Read and Write property)

3.9.20 ValidationSchemaFullChecking as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This method allows the user to turn full Schema constraint checking on/off.

Notes: Only takes effect if Schema validation is enabled.

If turned off, partial constraint checking is done.

Full schema constraint checking includes those checking that may be time-consuming or memory intensive. Currently, particle unique attribution constraint checking and particle derivation restriction checking are controlled by this option.

The parser's default state is: false.

(Read and Write property)

3.9.21 ValidationScheme as Integer

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The validation scheme to be used by this parser.

Notes: The value is one of the ValSchemes enumerated values defined by this class:

ValidateNever	turn off validation
ValidateAlways	turn on validation
ValidateAuto	turn on validation if any internal/external DTD subset have been seen

The parser's default state is: ValidateNever
(Read and Write property)

3.9.22 Constants

Validation

Constant	Value	Description
ValidateAlways	1	The parser will always report validation errors.
ValidateAuto	2	The parser will report validation errors only if a grammar is specified.
ValidateNever	0	Do not report validation errors.

3.10 class XMLElementMBS

3.10.1 class XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for a XML element.

Notes: By far the vast majority of objects (apart from text) that authors encounter when traversing a document are XMLElementMBS nodes.

Assume the following XML document:

```
<elementExample id="demo">
<subelement1/>
<subelement2><subsubelement/></subelement2>
</elementExample>
```

When represented using DOM, the top node is an XMLElementMBS node for "elementExample", which contains two child XMLElementMBS nodes, one for "subelement1" and one for "subelement2". "subelement1" contains no child nodes.

Elements may have attributes associated with them; since the XMLElementMBS interface inherits from XMLNodeMBS, the generic XMLNodeMBS interface method `getAttributes` may be used to retrieve the set of all attributes for an element. There are methods on the XMLElementMBS interface to retrieve either an XMLAttributeMBS object by name or an attribute value by name. In XML, where an attribute value may contain entity references, an XMLAttributeMBS object should be retrieved to examine the possibly fairly complex sub-tree representing the attribute value. On the other hand, in HTML, where all attributes have simple string values, methods to directly access an attribute value can safely be used as a convenience.

Subclass of the XMLNodeMBS class.

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

Blog Entries

- [Embracing for each loops](#)
- [MBS Xojo Plugins, version 23.4pr1](#)
- [MBS Xojo Plugins, version 22.4pr4](#)
- [Iterate over XML nodes](#)

Xojo Developer Magazine

- [21.2, pages 65 to 69: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes](#)

3.10.2 Methods

3.10.3 AttributeNode(Name as String) as XMLAttributeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Retrieves an XMLAttributeMBS node by name.

Notes: name: The name (nodeName) of the attribute to retrieve.

The XMLAttributeMBS node with the specified name (nodeName) or null if there is no such attribute.

3.10.4 AttributeNodeNS(namespaceURI as string, localName as String) as XMLAttributeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Retrieves an XMLAttributeMBS node by local name and namespace URI.

Notes: namespaceURI: The namespace URI of the attribute to retrieve.

localName: The local name of the attribute to retrieve.

The XMLAttributeMBS node with the specified attribute local name and namespace URI or nil if there is no such attribute.

3.10.5 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.10.6 Element(Index as Integer) as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries element with given index.

Notes: Returns nil if index is out of index.

3.10.7 ElementsByTagName(TagName as String) as XMLElementMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns a DOMNodeList of all descendant elements with a given tag name, in the order in which they would be encountered in a preorder traversal of the XMLElementMBS tree.

Notes: name: The name of the tag to match on. The special value "*" matches all tags.

A list of matching XMLElementMBS nodes.

3.10.8 ElementsByTagNameNS(namespaceURI as string, localName as String) as XMLElementMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns a nodes of all the DOMElements with a given local name and namespace URI in the order in which they would be encountered in a preorder traversal of the XMLDocumentMBS tree, starting from this node.

Notes: namespaceURI: The namespace URI of the elements to match on. The special value "*" matches all namespaces.

localName: The local name of the elements to match on. The special value "*" matches all local names.

3.10.9 HasAttribute(Name as String) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether an attribute exists.

Notes: Returns true when an attribute with a given name is specified on this element or has a default value, false otherwise.

name: The name of the attribute to look for.

Returns true if an attribute with the given name is specified on this element or has a default value, false otherwise.

3.10.10 HasAttributeNS(namespaceURI as string, localName as String) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Whether an attribute exists.

Notes: Returns true when an attribute with a given local name and namespace URI is specified on this element or has a default value, false otherwise.

namespaceURI: The namespace URI of the attribute to look for.

localName: The local name of the attribute to look for.

true: if an attribute with the given local name and namespace URI is specified or has a default value on this element, false otherwise.

3.10.11 IterateElements as XMLIterateElementsMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the elements.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><other>abc</other><test>def</test></doc>")
```

```
Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateElements
  MessageBox e.toString
Next
```

Notes: For use with For Each Loops in Xojo.

3.10.12 IterateElementsByTagName(TagName as String) as XMLIterateElementsMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the elements with matching tag name.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><test id='\"'\"'1\"'\"'>abc</test><test id='\"'\"'2\"'\"'>def</test></doc>")
```

```
Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateElementsByTagName("test")
  MessageBox e.toString
Next
```

Notes: For use with For Each Loops in Xojo.

3.10.13 IterateElementsByTagNameNS(namespaceURI as string, localName as String) as XMLIterateElementsMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the elements with matching tag name.

Notes: For use with For Each Loops in Xojo.

3.10.14 RemoveAttribute(Name as String)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Removes an attribute by name.

Example:

```
Dim xml As String = "<test>test</test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement
```

```
DocumentElement.AttributeValue("a") = "123"
```

```
MessageBox DocumentElement.toString
```

```
DocumentElement.RemoveAttribute("a")
```

```
MessageBox DocumentElement.toString
```

Notes: If the removed attribute is known to have a default value, an attribute immediately appears containing the default value as well as the corresponding namespace URI, local name, and prefix when applicable.

To remove an attribute by local name and namespace URI, use the removeAttributeNS method.

3.10.15 RemoveAttributeNode(Node as XMLAttributeMBS)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Removes the specified attribute node.

Notes: If the removed XMLAttributeMBS has a default value it is immediately replaced. The replacing attribute has the same namespace URI and local name, as well as the original prefix, when applicable.

3.10.16 RemoveAttributeNS(namespaceURI as string, localName as string)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Removes an attribute by local name and namespace URI.

Notes: If the removed attribute has a default value it is immediately replaced. The replacing attribute has

the same namespace URI and local name, as well as the original prefix.

namespaceURI: The namespace URI of the attribute to remove.

localName: The local name of the attribute to remove.

3.10.17 SetAttributeNode(AttributeNode as XMLAttributeMBS)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Adds a new attribute.

Notes: If an attribute with that name (nodeName) is already present in the element, it is replaced by the new one.

AttributeNode: The XMLAttributeMBS node to add to the attribute list.

If the AttributeNode attribute replaces an existing attribute, the replaced XMLAttributeMBS node is returned, otherwise null is returned.

If the new attribute is from another document, we clone it first.

3.10.18 SetAttributeNodeNS(AttributeNode as XMLAttributeMBS)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Adds a new attribute.

Notes: If an attribute with that local name and namespace URI is already present in the element, it is replaced by the new one.

AttributeNode: The XMLAttributeMBS node to add to the attribute list.

If the newAttr attribute replaces an existing attribute with the same local name and namespace URI, the replaced XMLAttributeMBS node is returned, otherwise nil is returned.

If the new attribute is from another document, we clone it first.

3.10.19 SetIdAttribute(name as string, isID as boolean)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Sets ID attribute.

Notes: If the parameter isId is true, this method declares the specified attribute to be a user-determined ID attribute. This affects the value of XMLAttributeMBS::isId and the behavior of ElementById in XMLDocumentMBS, but does not change any schema that may be in use, in particular this does not affect the SchemaTypeInfo XMLAttributeMBS of the specified XMLAttributeMBS node. Use the value false for the

parameter `isId` to undeclare an attribute for being a user-determined ID attribute. To specify an `XMLAttributeMBS` by local name and namespace URI, use the `setIdAttributeNS` method.

`name`: The name of the `XMLAttributeMBS`.

`isId`: Whether the attribute is of type ID.

3.10.20 `SetIdAttributeNode(idAttr as XMLAttributeMBS, isID as boolean)`

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Sets the id attribute node.

Notes: If the parameter `isId` is true, this method declares the specified attribute to be a user-determined ID attribute. This affects the value of `isId` of `XMLAttributeMBS` and the behavior of `getElementById` of `XMLDocumentMBS`, but does not change any schema that may be in use, in particular this does not affect the `SchemaTypeInfo` of `XMLAttributeMBS` of the specified `XMLAttributeMBS` node. Use the value `false` for the parameter `isId` to undeclare an attribute for being a user-determined ID attribute.

`idAttr`: The `XMLAttributeMBS` node.

`isId`: Whether the attribute is of type ID.

If the new attribute is from another document, we clone it first.

3.10.21 `SetIdAttributeNS(namespaceURI as string, localName as string, isID as boolean)`

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Sets id attribute.

Notes: If the parameter `isId` is true, this method declares the specified attribute to be a user-determined ID attribute. This affects the value of `isId` of `XMLAttributeMBS` and the behavior of `getElementById` of `XMLDocumentMBS`, but does not change any schema that may be in use, in particular this does not affect the `getSchemaTypeInfo` of `XMLAttributeMBS` of the specified `XMLAttributeMBS` node. Use the value `false` for the parameter `isId` to undeclare an attribute for being a user-determined ID attribute.

`namespaceURI`: The namespace URI of the `XMLAttributeMBS`.

`localName`: The local name of the `XMLAttributeMBS`.

`isId`: Whether the attribute is of type ID.

3.10.22 Properties

3.10.23 ChildElementCount as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The number of child nodes that are of type XMLElementMBS.

Notes: Note: the count is computed every time this function is invoked

The number of XMLElementMBS objects that are direct children of this object (nested elements are not counted), or 0 if there is none.

(Read only property)

3.10.24 FirstElementChild as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The first child of type XMLElementMBS.

Notes: The XMLElementMBS object that is the first element node among the child nodes of this node, or nil if there is none.

(Read only property)

3.10.25 LastElementChild as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The last child of type XMLElementMBS.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim doc As New XMLDocumentMBS(xml)
```

```
Dim DocumentElement As XMLElementMBS = doc.DocumentElement
```

```
// looping over elements backwards, skips e.g. text nodes and comments
```

```
Dim node As XMLElementMBS = DocumentElement.LastElementChild
```

```
While node <> Nil
```

```
// show each child
```

```
MessageBox node.toString
```

```
node = node.PreviousElementSibling
```

```
// loop ends when there is no next one
```

```
Wend
```

Notes: The XMLElementMBS object that is the last element node among the child nodes of this node, or nil if there is none.
(Read only property)

3.10.26 NextElementSibling as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The next sibling node of type XMLElementMBS.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// looping over elements skips e.g. text nodes and comments
Dim node As XMLElementMBS = DocumentElement.FirstElementChild
While node <> Nil

// show each child
MessageBox node.toString

node = node.NextElementSibling
// loop ends when there is no next one
Wend
```

Notes: The XMLElementMBS object that is the next sibling element node in document order, or nil if there is none.
(Read only property)

3.10.27 PreviousElementSibling as XMLElementMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The previous sibling node of type XMLElementMBS.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// looping over elements backwards, skips e.g. text nodes and comments
Dim node As XMLElementMBS = DocumentElement.LastElementChild
While node <> Nil
```

```
// show each child
MessageBox node.toString

node = node.PreviousElementSibling
// loop ends when there is no next one
Wend
```

Notes: The XMLElementMBS object that is the previous sibling element node in document order, or nil if there is none.

(Read only property)

3.10.28 SchemaTypeInfo as XMLTypeInfoMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the type information associated with this element.

Notes: (Read only property)

3.10.29 TagName as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The name of the element.

Notes: For example, in: <elementExample id="demo">... </elementExample>, tagName has the value "elementExample". Note that this is case-preserving in XML, as are all of the operations of the DOM.

(Read only property)

3.10.30 AttributeValue(Name as String) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Retrieves an attribute value by name.

Example:

```
Dim doc As New XMLDocumentMBS
Dim node As XMLElementMBS = doc.createElement("Hello")
```

```
node.AttributeValue("Hello") = "World"
node.AttributeValue("Value") = "123"
node.AttributeValue("Test") = "Value"
```

```
Dim attrs() As XMLAttributeMBS = node.AttributeNodes
For Each a As XMLAttributeMBS In attrs
```

MessageBox a.Name+": "+a.Value

[Next](#)

Notes: name: The name of the attribute to retrieve.

The XMLAttributeMBS value as a string, or the empty string if that attribute does not have a specified or default value.

If assigned, adds/sets a new attribute.

If an attribute with that name is already present in the element, its value is changed to be that of the value parameter. This value is a simple string, it is not parsed as it is being set. So any markup (such as syntax to be recognized as an entity reference) is treated as literal text, and needs to be appropriately escaped by the implementation when it is written out. In order to assign an attribute value that contains entity references, the user must create an XMLAttributeMBS node plus any XMLTextMBS and XMLEntityReferenceMBS nodes, build the appropriate subtree, and use setAttributeNode to assign it as the value of an attribute. (Read and Write computed property)

3.10.31 AttributeValueNS(namespaceURI as string, localName as string) as string

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Retrieves an attribute value by local name and namespace URI.

Notes: namespaceURI The namespace URI of the attribute to retrieve.

localName The local name of the attribute to retrieve.

Returns the XMLAttributeMBS value as a string, or an "" if that attribute does not have a specified or default value.

Adds a new attribute when assigned.

If an attribute with the same local name and namespace URI is already present on the element, its prefix is changed to be the prefix part of the qualifiedName, and its value is changed to be the value parameter. This value is a simple string, it is not parsed as it is being set. So any markup (such as syntax to be recognized as an entity reference) is treated as literal text, and needs to be appropriately escaped by the implementation when it is written out. In order to assign an attribute value that contains entity references, the user must create an XMLAttributeMBS node plus any XMLTextMBS and XMLEntityReferenceMBS nodes, build the appropriate subtree, and use setAttributeNodeNS or setAttributeNode to assign it as the value of an attribute.

namespaceURI: The namespace URI of the attribute to create or alter.

qualifiedName: The qualified name of the attribute to create or alter.

value: The value to set in string form.

(Read and Write computed property)

3.11 class XMLEntityMBS

3.11.1 class XMLEntityMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This interface represents an entity, either parsed or unparsed, in an XML document.

Notes: Note that this models the entity itself not the entity declaration. XMLEntityMBS declaration modeling has been left for a later Level of the DOM specification.

The nodeName attribute that is inherited from XMLNodeMBS contains the name of the entity.

An XML processor may choose to completely expand entities before the structure model is passed to the DOM; in this case there will be no XMLEntityReferenceMBS nodes in the document tree.

XML does not mandate that a non-validating XML processor read and process entity declarations made in the external subset or declared in external parameter entities. This means that parsed entities declared in the external subset need not be expanded by some classes of applications, and that the replacement value of the entity may not be available. When the replacement value is available, the corresponding XMLEntityMBS node's child list represents the structure of that replacement text. Otherwise, the child list is empty.

The DOM Level 2 does not support editing XMLEntityMBS nodes; if a user wants to make changes to the contents of an XMLEntityMBS, every related XMLEntityReferenceMBS node has to be replaced in the structure model by a clone of the XMLEntityMBS's contents, and then the desired changes must be made to each of those clones instead. XMLEntityMBS nodes and all their descendants are readonly.

An XMLEntityMBS node does not have any parent. If the entity contains an unbound namespace prefix, the namespaceURI of the corresponding node in the XMLEntityMBS node subtree is null. The same is true for XMLEntityReferenceMBS nodes that refer to this entity, when they are created using the createEntityReference method of the XMLDocumentMBS interface. The DOM Level 2 does not support any mechanism to resolve namespace prefixes.

Subclass of the XMLNodeMBS class.

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

3.11.2 Methods

3.11.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.11.4 Properties

3.11.5 InputEncoding as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: An attribute specifying the encoding used for this entity at the time of parsing, when it is an

external parsed entity.

Notes: This is empty if it an entity from the internal subset or if it is not known.
(Read only property)

3.11.6 NotationName as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: For unparsed entities, the name of the notation for the entity.

Notes: For parsed entities, this is empty.
(Read only property)

3.11.7 PublicId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The public identifier associated with the entity, if specified.

Notes: If the public identifier was not specified, this is empty.
(Read only property)

3.11.8 SystemId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The system identifier associated with the entity, if specified.

Notes: If the system identifier was not specified, this is empty.
(Read only property)

3.11.9 XmlEncoding as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: An attribute specifying, as part of the text declaration, the encoding of this entity, when it is an external parsed entity.

Notes: This is empty otherwise.
(Read only property)

3.11.10 XmlVersion as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: An attribute specifying, as part of the text declaration, the version number of this entity, when it is an external parsed entity.

Notes: This is empty otherwise.
(Read only property)

3.12 class XMLEntityReferenceMBS

3.12.1 class XMLEntityReferenceMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for an entity reference.

Notes: XMLEntityReferenceMBS objects may be inserted into the structure model when an entity reference is in the source document, or when the user wishes to insert an entity reference. Note that character references and references to predefined entities are considered to be expanded by the HTML or XML processor so that characters are represented by their Unicode equivalent rather than by an entity reference. Moreover, the XML processor may completely expand references to entities while building the structure model, instead of providing XMLEntityReferenceMBS objects. If it does provide such objects, then for a given XMLEntityReferenceMBS node, it may be that there is no XMLEntityMBS node representing the referenced entity. If such an XMLEntityMBS exists, then the subtree of the XMLEntityReferenceMBS node is in general a copy of the XMLEntityMBS node subtree. However, this may not be true when an entity contains an unbound namespace prefix. In such a case, because the namespace prefix resolution depends on where the entity reference is, the descendants of the XMLEntityReferenceMBS node may be bound to different namespace URIs.

As for XMLEntityMBS nodes, XMLEntityReferenceMBS nodes and all their descendants are readonly.

Subclass of the XMLNodeMBS class.

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

3.12.2 Methods

3.12.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.13 class XMLExceptionMBS

3.13.1 class XMLExceptionMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for exceptions in the XML world.

Notes: Subclass of the RuntimeException class.

3.14 class XMLInputMBS

3.14.1 class XMLInputMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This interface represents a single input source for an XML entity.

Example:

```
Dim xmlText As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim Input As New XMLInputMBS
```

```
Input.Encoding = "UTF-8"
```

```
Input.InputString = xmlText
```

```
Dim parser As New XMLParserMBS
```

```
Dim doc As XMLDocumentMBS = parser.parse(Input)
```

```
// inspect document in debugger
```

```
MessageBox doc.toString
```

Notes: This interface allows an application to encapsulate information about an input source in a single object, which may include a public identifier, a system identifier, a byte stream (possibly with a specified encoding), and/or a character stream.

There are two places that the application will deliver this input source to the parser: as the argument to the parse method, or as the return value of the XMLResourceResolverMBS.resolveResource method.

The XMLParserMBS will use the XMLInputMBS object to determine how to read XML input. If there is a character stream available, the parser will read that stream directly; if not, the parser will use a byte stream, if available; if neither a character stream nor a byte stream is available, the parser will attempt to open a URI connection to the resource identified by the system identifier.

A XMLInputMBS object belongs to the application: the parser shall never modify it in any way (it may modify a copy if necessary).

3.14.2 Methods

3.14.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.14.4 Properties

3.14.5 BaseURI as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The base URI to be used for resolving relative URIs to absolute URIs.

Notes: If the baseURI is itself a relative URI, the behavior is implementation dependent.
(Read and Write property)

3.14.6 Encoding as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The encoding which will be required for use with the XML text read via a stream opened by this input source.

Example:

```
Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = "<test id=""123"">Hello</test>"
```

Notes: This is usually not set, allowing the encoding to be sensed in the usual XML way. However, in some cases, the encoding in the file is known to be incorrect because of intermediate transcoding, for instance encapsulation within a MIME document.

(Read and Write property)

3.14.7 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.14.8 InputMemory as MemoryBlock

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The input memoryblock.

Notes: (Read and Write property)

3.14.9 InputString as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The input string.

Example:

```
Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = "<test id=""123"">Hello</test>"
```

Notes: (Read and Write property)

3.14.10 IssueFatalErrorIfNotFound as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Indicates if the parser should issue fatal error if this input source is not found.

Notes: If set to false, the parser issue warning message instead.

Default: true

(Read and Write property)

3.14.11 PublicId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The public identifier for this input source.

Notes: The public identifier is always optional: if the application writer includes one, it will be provided as part of the location information.

(Read and Write property)

3.14.12 SystemId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The system identifier for this input source.

Notes: The system id is always required. The public id may be used to map to another system id, but the system id must always be present as a fall back.

If the system ID is a URL, it must be fully resolved.

(Read and Write property)

3.15 class XMLIterateAttributeNodesMBS

3.15.1 class XMLIterateAttributeNodesMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for the iterator over attribute nodes.

Example:

```
Dim doc As New XMLDocumentMBS("<doc id=""123"" value=""test""></doc>")
```

```
Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLAttributeMBS In root.IterateAttributeNodes
  MessageBox e.Name+": " + e.Value
Next
```

Notes: Used internally for for each loops.

Requires Xojo 2019r2 or newer.

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.

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

Blog Entries

- [MBS Xojo Plugins, version 23.6pr1](#)
- [Embracing for each loops](#)

Interfaces: Iterator, Iterable

3.15.2 Methods

3.15.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.15.4 Iterator as Iterator

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries the iterator.

3.15.5 MoveNext as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves to next attribute.

Notes: Returns true on success or false when the iterator has no more elements.

3.15.6 Value as Variant

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The current value.

3.16 class XMLIterateChildNodesMBS

3.16.1 class XMLIterateChildNodesMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for the iterator over child nodes.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><test>abc</test><test>def</test></doc>")
```

```
Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateChildNodes
    MessageBox e.toString
Next
```

Notes: Used internally for for each loops.

Requires Xojo 2019r2 or newer.

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.

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

Blog Entries

- [MBS Xojo Plugins, version 23.6pr1](#)
- [Embracing for each loops](#)

Interfaces: Iterator, Iterable

3.16.2 Methods

3.16.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.16.4 Iterator as Iterator

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries the iterator.

3.16.5 MoveNext as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves to next child node.

Notes: Returns true on success or false when the iterator has no more elements.

3.16.6 Value as Variant

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The current value.

3.17 class XMLIterateElementsMBS

3.17.1 class XMLIterateElementsMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for the iterator over elements.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1"">abc</test><test id=""2"">def</test></doc>")
```

```
For Each e As XMLElementMBS In doc.IterateElementsByTagName("test")
```

```
    MessageBox e.toString
```

```
Next
```

Notes: Used internally for for each loops.

Requires Xojo 2019r2 or newer.

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.

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

Blog Entries

- [MBS Xojo Plugins, version 23.6pr1](#)
- [Embracing for each loops](#)

Interfaces: Iterator, Iterable

3.17.2 Methods

3.17.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.17.4 Iterator as Iterator

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries the iterator.

3.17.5 MoveNext as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves to next element.

Notes: Returns true on success or false when the iterator has no more elements.

3.17.6 Value as Variant

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The current value.

3.18 class XMLNodeFilterMBS

3.18.1 class XMLNodeFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Filters are objects that know how to "filter out" nodes.

Notes: If a XMLNodeIteratorMBS or XMLTreeWalkerMBS is given a XMLNodeFilterMBS, it applies the filter before it returns the next node. If the filter says to accept the node, the traversal logic returns it; otherwise, traversal looks for the next node and pretends that the node that was rejected was not there.

The DOM does not provide any filters. XMLNodeFilterMBS is just a class that users can implement to provide their own filters by filling in the event.

XMLNodeFilterMBSs do not need to know how to traverse from node to node, nor do they need to know anything about the data structure that is being traversed. This makes it very easy to write filters, since the only thing they have to know how to do is evaluate a single node. One filter may be used with a number of different kinds of traversals, encouraging code reuse.

Blog Entries

- [Embracing for each loops](#)

3.18.2 Methods

3.18.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.18.4 Destructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The destructor.

3.18.5 Events

3.18.6 acceptNode(node as XMLNodeMBS) as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

Function: Test whether a specified node is visible in the logical view of a `XMLTreeWalkerMBS` or `XMLNodeIteratorMBS`.

Notes: This event will be called by the implementation of `XMLTreeWalkerMBS` and `XMLNodeIteratorMBS`; it is not normally called directly from user code. (Though you could do so if you wanted to use the same filter to guide your own application logic.)

node: The node to check to see if it passes the filter or not.

A constant to determine whether the node is accepted, rejected, or skipped, as defined above.

3.18.7 Constants

Filter Results

Constant	Value	Description
<code>FilterAccept</code>	1	Accept the node. Navigation methods defined for <code>XMLNodeIteratorMBS</code> or <code>XMLTreeWalkerMBS</code> will return this node.
<code>FilterReject</code>	2	Reject the node. Navigation methods defined for <code>XMLNodeIteratorMBS</code> or <code>XMLTreeWalkerMBS</code> will not return this node. For <code>XMLTreeWalkerMBS</code> , the children of this node will also be rejected. <code>XMLNodeIteratorMBS</code> s treat this as a synonym for <code>FilterSkip</code> .
<code>FilterSkip</code>	3	Skip this single node. Navigation methods defined for <code>XMLNodeIteratorMBS</code> or <code>XMLTreeWalkerMBS</code> will not return this node. For both <code>XMLNodeIteratorMBS</code> and <code>XMLTreeWalkerMBS</code> , the children of this node will still be considered.

3.19 class XMLNodeIteratorMBS

3.19.1 class XMLNodeIteratorMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates a list of nodes.

Notes: XMLNodeIteratorMBSs are used to step through a set of nodes, e.g. the set of nodes in a DOMNodeList, the document subtree governed by a particular XMLNodeMBS, the results of a query, or any other set of nodes. The set of nodes to be iterated is determined by the implementation of the XMLNodeIteratorMBS. DOM Level 2 specifies a single XMLNodeIteratorMBS implementation for document-order traversal of a document subtree. Instances of these XMLNodeIteratorMBSs are created by calling createNodeIterator().

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.

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

Blog Entries

- [Embracing for each loops](#)
- [MBS Xojo Plugins in version 22.4](#)
- [MBS Xojo Plugins, version 22.4pr2](#)
- [New XML Plugin for Xojo](#)

3.19.2 Methods

3.19.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.19.4 nextNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the next node in the set and advances the position of the XMLNodeIteratorMBS in the set.

Notes: After a XMLNodeIteratorMBS is created, the first call to nextNode() returns the first node in the set.

The next XMLNodeMBS in the set being iterated over, or null if there are no more members in that set. @exception DOMException INVALID_STATE_ERR: Raised if this method is called after the detach method was invoked.

3.19.5 previousNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the previous node in the set and moves the position of the XMLNodeIteratorMBS backwards in the set.

Notes: The previous XMLNodeMBS in the set being iterated over, or null if there are no more members in that set.

3.19.6 Properties

3.19.7 Current as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The current node.

Notes: Starts with the root node.

(Read only property)

3.19.8 Document as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The owning document.

Notes: (Read only property)

3.19.9 ExpandEntityReferences as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Return the expandEntityReferences flag.

Notes: The value of this flag determines whether the children of entity reference nodes are visible to the XMLNodeIteratorMBS. If false, these children and their descendants will be rejected. Note that this rejection takes precedence over whatToShow and the filter. Also note that this is currently the only situation where XMLNodeIteratorMBSs may reject a complete subtree rather than skipping individual nodes.

To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the `whatToShow` flags to hide the entity reference node and set `expandEntityReferences` to true when creating the `XMLNodeIteratorMBS`. To produce a view of the document that has entity reference nodes but no entity expansion, use the `whatToShow` flags to show the entity reference node and set `expandEntityReferences` to false.

(Read only property)

3.19.10 Filter as XMLNodeFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The `XMLNodeFilterMBS` used to screen nodes.

Notes: (Read only property)

3.19.11 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.19.12 Root as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The root node of the `XMLNodeIteratorMBS`, as specified when it was created.

Notes: (Read only property)

3.19.13 WhatToShow as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Return which node types are presented via the iterator.

Notes: This attribute determines which node types are presented via the `XMLNodeIteratorMBS`. The available set of constants is defined in the `XMLNodeFilterMBS` interface. Nodes not accepted by `whatToShow` will be skipped, but their children may still be considered. Note that this skip takes precedence over the filter, if any.

Default is `ShowAll`.

(Read only property)

3.20 class XMLNodeMBS

3.20.1 class XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLNodeMBS interface is the primary datatype for the entire Document Object Model.

Notes: It represents a single node in the document tree. While all objects implementing the XMLNodeMBS interface expose methods for dealing with children, not all objects implementing the XMLNodeMBS interface may have children. For example, XMLTextMBS nodes may not have children, and adding children to such nodes results in a XMLExceptionMBS being raised.

The attributes nodeName, nodeValue and attributes are included as a mechanism to get at node information without casting down to the specific derived interface. In cases where there is no obvious mapping of these attributes for a specific nodeType (e.g., nodeValue for an XMLElementMBS or attributes for a XMLCommentMBS), this returns nil. Note that the specialized interfaces may contain additional and more convenient mechanisms to get and set the relevant information.

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

Blog Entries

- [Embracing for each loops](#)
- [MBS Xojo Plugins, version 23.4pr1](#)
- [News from the MBS Xojo Plugins in Version 23.0](#)
- [Xojo 2022r4 released](#)
- [MBS Xojo Plugins, version 22.6pr1](#)
- [MBS Xojo Plugins, version 22.4pr3](#)

Xojo Developer Magazine

- [21.2, page 69: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes](#)

3.20.2 Methods

3.20.3 appendChild(newChild as XMLNodeMBS) as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Adds the node newChild to the end of the list of children of this node.

Notes: If the newChild is already in the tree, it is first removed.

newChild The node to add. If it is a XMLDocumentFragmentMBS object, the entire contents of the document fragment are moved into the child list of this node.

If the new node is from another document, we clone it first.

Returns the newly added node.

3.20.4 AttributeNode(Index as Integer) as XMLAttributeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries attribute node by index.

Notes: Index is zero based up to AttributeCount-1.

3.20.5 AttributeNodes as XMLAttributeMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries an array with all attributes.

Example:

```
Dim doc As New XMLDocumentMBS
Dim node As XMLElementMBS = doc.createElement("Hello")

// add some attributes
node.AttributeValue("Hello") = "World"
node.AttributeValue("Value") = "123"
node.AttributeValue("Test") = "Value"

// now show them all in message dialogs
Dim attrs() As XMLAttributeMBS = node.AttributeNodes
For Each a As XMLAttributeMBS In attrs
  MessageBox a.Name+": "+a.Value
Next
```

Notes: Gets a array containing the attributes of this node (if it is an XMLElementMBS) or null otherwise.

3.20.6 Child(Index as Integer) as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries child node with given index.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
```

```

Dim node As XMLNodeMBS = doc.DocumentElement

Dim count As Integer = node.ChildCount
Dim node0 As XMLNodeMBS = node.Child(0)
Dim node1 As XMLNodeMBS = node.Child(1)
Dim node2 As XMLNodeMBS = node.Child(2)
Dim node3 As XMLNodeMBS = node.Child(3)
'Dim node4 As XMLNodeMBS = node.Child(4) // out of bounds exception
Break // see debugger

```

Notes: Index is zero based up to ChildCount-1.

3.20.7 ChildNodes as XMLNodeMBS()

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets a DOMNodeList that contains all children of this node.

Example:

```

Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLNodeMBS = doc.DocumentElement

Dim children() As XMLNodeMBS = DocumentElement.ChildNodes
For Each node As XMLNodeMBS In children
    MessageBox node.toString
Next

```

Notes: If there are no children, this is a array containing no nodes.

The array is a static snapshot of the content of the node.

3.20.8 Clone(deep as Boolean) as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns a duplicate of this node.

Notes: Pass true for deep parameter to copy all sub objects as well.

This function serves as a generic copy constructor for nodes.

The duplicate node has no parent (parentNode returns nil.).

Cloning an XMLElementMBS copies all attributes and their values, including those generated by the XML processor to represent defaulted attributes, but this method does not copy any text it contains unless it is a deep clone, since the text is contained in a child XMLTextMBS node. Cloning any other type of node simply returns a copy of this node.

deep If true, recursively clone the subtree under the specified node; if false, clone only the node itself (and its attributes, if it is an XMLElementMBS).

3.20.9 compareDocumentPosition(other as XMLNodeMBS) as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Compares two nodes for their position in the document.

Notes: Compares the reference node, i.e. the node on which this method is being called, with a node, i.e. the one passed as a parameter, with regard to their position in the document and according to the document order.

other: The node to compare against this node.

Returns how the given node is positioned relatively to this node.

3.20.10 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.20.11 insertBefore(newChild as XMLNodeMBS, refChild as XMLNodeMBS) as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Inserts the node newChild before the existing child node refChild.

Notes: If refChild is nil, insert newChild at the end of the list of children.

If newChild is a XMLDocumentFragmentMBS object, all of its children are inserted, in the same order, before refChild. If the newChild is already in the tree, it is first removed. Note that a XMLNodeMBS that has never been assigned to refer to an actual node is == nil.

newChild The node to insert.

refChild The reference node, i.e., the node before which the new node must be inserted.

If the new node is from another document, we clone it first.

Returns the new node.

3.20.12 isDefaultNamespace(namespaceURI as String) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This method checks if the specified namespaceURI is the default namespace or not.

Notes: namespaceURI: The namespace URI to look for.

Returns true if the specified namespaceURI is the default namespace, false otherwise.

3.20.13 isEqualNode(other as XMLNodeMBS) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Tests whether two nodes are equal.

Notes: This method tests for equality of nodes, not sameness (i.e., whether the two nodes are pointers to the same object) which can be tested with XMLNodeMBS::isSameNode. All nodes that are the same will also be equal, though the reverse may not be true.

Two nodes are equal if and only if the following conditions are satisfied: The two nodes are of the same type. The following string attributes are equal: nodeName, localName, namespaceURI, prefix, nodeValue, baseURI. This is: they are both null, or they have the same length and are character for character identical. The attributes node maps are equal. This is: they are both nil, or they have the same length and for each node that exists in one map there is a node that exists in the other map and is equal, although not necessarily at the same index. The childNodes node lists are equal. This is: they are both nil, or they have the same length and contain equal nodes at the same index. This is true for XMLAttributeMBS nodes as for any other type of node. Note that normalization can affect equality; to avoid this, nodes should be normalized before being compared.

For two XMLDocumentTypeMBS nodes to be equal, the following conditions must also be satisfied: The following string attributes are equal: publicId, systemId, internalSubset. The entities node maps are equal. The notations node maps are equal.

On the other hand, the following do not affect equality: the ownerDocument attribute, the specified attribute for XMLAttributeMBS nodes, the isWhitespaceInElementContent attribute for XMLTextMBS nodes, as well as any user data or event listeners registered on the nodes.

other: The node to compare equality with.

If the nodes, and possibly subtrees are equal, true otherwise false.

3.20.14 isSameNode(other as XMLNodeMBS) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns whether this node is the same node as the given one.

Notes: This method provides a way to determine whether two XMLNodeMBS references returned by the implementation reference the same object. When two XMLNodeMBS references are references to the same object, even if through a proxy, the references may be used completely interchangeably, such that all attributes have the same values and calling the same DOM method on either reference always has exactly the same effect.

other: The node to test against.

Returns true if the nodes are the same, false otherwise.

3.20.15 IterateAttributeNodes as XMLIterateAttributeNodesMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the attributes.

Example:

```
Dim doc As New XMLDocumentMBS("<doc id=""123"" value=""test""></doc>")
```

```
Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLAttributeMBS In root.IterateAttributeNodes
  MessageBox e.Name+": "+e.Value
Next
```

Notes: For use with For Each Loops in Xojo.

3.20.16 IterateChildNodes as XMLIterateChildNodesMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates over the child nodes.

Example:

```
Dim doc As New XMLDocumentMBS("<doc><test>abc</test><test>def</test></doc>")
```

```
Dim root As XMLNodeMBS = doc.DocumentElement
For Each e As XMLNodeMBS In root.IterateChildNodes
    MessageBox e.ToString
Next
```

Notes: For use with For Each Loops in Xojo.

3.20.17 lookupNamespaceURI(prefix as String) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Look up the namespace URI associated to the given prefix, starting from this node.

Notes: The prefix to look for. If this parameter is null, the method will return the default namespace URI if any.

Returns the associated namespace URI or null if none is found.

3.20.18 lookupPrefix(namespaceURI as String) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Look up the prefix associated to the given namespace URI, starting from this node.

Notes: The default namespace declarations are ignored by this method.

namespaceURI: The namespace URI to look for.

Returns an associated namespace prefix if found, null if none is found. If more than one prefix are associated to the namespace prefix, the returned namespace prefix is implementation dependent.

3.20.19 Normalize

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Normalizes the node tree.

Notes: Puts all XMLTextMBS nodes in the full depth of the sub-tree underneath this XMLNodeMBS, including attribute nodes, into a "normal" form where only markup (e.g., tags, comments, processing instructions, CDATA sections, and entity references) separates XMLTextMBS nodes, i.e., there are neither adjacent XMLTextMBS nodes nor empty XMLTextMBS nodes. This can be used to ensure that the DOM view of a document is the same as if it were saved and re-loaded, and is useful when operations (such as XPointer lookups) that depend on a particular document tree structure are to be used.

Note: In cases where the document contains CDATASections, the normalize operation alone may not be sufficient, since XPointers do not differentiate between XMLTextMBS nodes and XMLCDATASectionMBS nodes.

3.20.20 removeChild(Node as XMLNodeMBS)

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Removes the child node indicated by oldChild from the list of children.

Notes: Returns the old node.

3.20.21 replaceChild(newChild as XMLNodeMBS, oldChild as XMLNodeMBS) as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Replaces the child node oldChild with newChild in the list of children, and returns the oldChild node.

Notes: If newChild is a XMLDocumentFragmentMBS object, oldChild is replaced by all of the XMLDocumentFragmentMBS children, which are inserted in the same order.

If the newChild is already in the tree, it is first removed.

newChild The new node to put in the child list.

oldChild The node being replaced in the list.

If the new node is from another document, we clone it first.

Returns the old node.

3.20.22 Properties

3.20.23 AttributeCount as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries number of attributes.

Example:

```
Dim doc As New XMLDocumentMBS
```

```
Dim node As XMLElementMBS = doc.createElement("Hello")
```

```
node.AttributeValue("Hello") = "World"
node.AttributeValue("Value") = "123"
node.AttributeValue("Test") = "Value"
```

MessageBox node.AttributeCount.ToString // shows 3

Notes: (Read only property)

3.20.24 BaseURI as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The absolute base URI of this node or "" if undefined.

Notes: This value is computed according to . However, when the XMLDocumentMBS supports the feature "HTML" , the base URI is computed using first the value of the href attribute of the HTML BASE element if any, and the value of the documentURI attribute from the XMLDocumentMBS interface otherwise.

When the node is an XMLElementMBS, a XMLDocumentMBS or a XMLProcessingInstructionMBS, this attribute represents the properties [base URI] defined in . When the node is a XMLNotationMBS, an XMLEntityMBS, or an XMLEntityReferenceMBS, this attribute represents the properties [declaration base URI] .

(Read only property)

3.20.25 ChildCount as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Queries number of child nodes.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim node As XMLElementMBS = doc.DocumentElement
```

MessageBox node.ChildCount.ToString+ " Children"

Notes: (Read only property)

3.20.26 FirstChild as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the first child of this node.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim doc As New XMLDocumentMBS(xml)
```

```
Dim DocumentElement As XMLElementMBS = doc.DocumentElement
```

```
Dim node As XmlNodeMBS = DocumentElement.FirstChild
```

```
While node <> Nil
```

```
    // show each child
```

```
    MessageBox node.toString
```

```
    node = node.NextSibling
```

```
    // loop ends when there is no next one
```

```
Wend
```

Notes: If there is no such node, this returns nil.

(Read only property)

3.20.27 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.20.28 hasAttributes as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns whether this node (if it is an element) has any attributes.

Notes: Returns true if this node has any attributes, false otherwise.

(Read only property)

3.20.29 hasChildren as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This is a convenience method to allow easy determination of whether a node has any children.

Example:

```
Dim xml As String = "<test>test</test>"
```

```

Dim doc As New XmlDocumentMBS(xml)
Dim DocumentElement As XElementMBS = doc.DocumentElement

MessageBox "HasChildren: "+DocumentElement.hasChildren.ToString // shows true

DocumentElement.removeChild DocumentElement.FirstChild

MessageBox "HasChildren after removal: "+DocumentElement.hasChildren.ToString // shows false

```

Notes: Returns true if the node has any children, false if the node has no children.
(Read only property)

3.20.30 LastChild as XmlNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the last child of this node.

Example:

```

Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XmlDocumentMBS(xml)
Dim DocumentElement As XElementMBS = doc.DocumentElement

// loop over nodes backwards
Dim node As XmlNodeMBS = DocumentElement.LastChild
While node <> Nil

// show each child
MessageBox node.toString

node = node.PreviousSibling
// loop ends when there is no previous one
Wend

```

Notes: If there is no such node, this returns nil.
(Read only property)

3.20.31 LocalName as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the local part of the qualified name of this node.

Notes: For nodes created with a DOM Level 1 method, such as createElement from the XmlDocumentMBS interface, it is "".

(Read only property)

3.20.32 NamespaceURI as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The namespace URI.

Notes: Get the namespace URI of this node, or "" if it is unspecified.

This is not a computed value that is the result of a namespace lookup based on an examination of the namespace declarations in scope. It is merely the namespace URI given at creation time.

For nodes of any type other than element and attribute and nodes created with a DOM Level 1 method, such as createElement from the XMLDocumentMBS interface, this is always "".

(Read only property)

3.20.33 NextSibling as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the node immediately following this node.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim doc As New XMLDocumentMBS(xml)
```

```
Dim DocumentElement As XElementMBS = doc.DocumentElement
```

```
Dim node As XmlNodeMBS = DocumentElement.FirstChild
```

```
While node <> Nil
```

```
  // show each child
```

```
  MessageBox node.toString
```

```
  node = node.NextSibling
```

```
  // loop ends when there is no next one
```

```
Wend
```

Notes: If there is no such node, this returns nil.

(Read only property)

3.20.34 NodeName as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The name of this node, depending on its type.

Notes: This property can also be used with name "Name".
(Read only property)

3.20.35 NodeType as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The type of this node.

Example:

```
Dim xml As String = "<test id=""123"">Hello</test>"
Dim doc As New XMLDocumentMBS(xml)
```

MessageBox doc.DocumentElement.NodeType.ToString // shows 1 for element

Notes: See Type* constants.

(Read only property)

3.20.36 NodeValue as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the value of this node, depending on its type.

Notes: Sets the value of the node.

Any node which can have a nodeValue will also accept requests to set it to a string. The exact response to this varies from node to node – Attribute, for example, stores its values in its children and has to replace them with a new Text holding the replacement value.

For most types of Node, value is null and attempting to set it will throw XMLExceptionMBS. This will also be thrown if the node is read-only.

This property can also be used with name Value.

(Read and Write property)

3.20.37 OwnerDocument as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the XMLDocumentMBS object associated with this node.

Notes: This is also the XMLDocumentMBS object used to create new nodes.

When this node is a XMLDocumentMBS or a XMLDocumentTypeMBS which is not used with any XMLDocumentMBS yet, this is nil.

(Read only property)

3.20.38 ParentNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the parent of this node.

Notes: All nodes, except XMLDocumentMBS, XMLDocumentFragmentMBS, and XMLAttributeMBS may have a parent. However, if a node has just been created and not yet added to the tree, or if it has been removed from the tree, a null XMLNodeMBS is returned.

(Read only property)

3.20.39 Prefix as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Get the namespace prefix of this node, or "" if it is unspecified.

Notes: Can be set.

Note that setting this attribute, when permitted, changes the nodeName attribute, which holds the qualified name, as well as the tagName and name attributes of the XMLElementMBS and XMLAttributeMBS interfaces, when applicable.

Note also that changing the prefix of an attribute, that is known to have a default value, does not make a new attribute with the default value and the original prefix appear, since the namespaceURI and localName do not change.

(Read and Write property)

3.20.40 PreviousSibling as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Gets the node immediately preceding this node.

Example:

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim doc As New XMLDocumentMBS(xml)
```

```
Dim DocumentElement As XMLElementMBS = doc.DocumentElement
```

```
// loop over nodes backwards
```

```
Dim node As XMLNodeMBS = DocumentElement.LastChild
```

```

While node <>Nil
// show each child
MessageBox node.toString

node = node.PreviousSibling
// loop ends when there is no previous one
Wend

```

Notes: If there is no such node, this returns nil.
(Read only property)

3.20.41 ReferenceCount as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The reference count.

Notes: Helps us to debug memory leaks.
(Read only property)

3.20.42 toString as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Creates an UTF-8 encoded text representation of the XML.

Example:

```

Dim xml As String = "<test id=""123"">Hello</test>"
Dim doc As New XMLDocumentMBS(xml)

```

```

MessageBox doc.toString

```

Notes: Convenience function to use XMLSerializerMBS class internally.
(Read only property)

3.20.43 Constants

Document Positions

Constant	Value	Description
DocumentPositionContainedBy	16	The node is contained by the reference node. A node which is contained by is always following, too.
DocumentPositionContains	8	The node contains the reference node. A node which contains is always preceding, too.
DocumentPositionDisconnected	1	The two nodes are disconnected. Order between disconnected nodes is implementation-specific.
DocumentPositionFollowing	4	The node follows the reference node.
DocumentPositionImplementationSpecific	32	The determination of preceding versus following is implementation-specific.
DocumentPositionPreceding	2	The second node precedes the reference node.

Types

Constant	Value	Description
TypeAttribute	2	Attribute Node
TypeCDATASection	4	CDATASection Node
TypeComment	8	Comment Node
TypeDocument	9	Document Node
TypeDocumentFragment	11	Document Fragment
TypeDocumentType	10	Document Type Node
TypeElement	1	Element Node
TypeEntity	6	Entity Node
TypeEntityReferenceNode	5	Entity Reference Node
TypeNotation	12	Notation Node
TypeProcessingInstruction	7	Processing Instruction Node
TypeText	3	Text Node

3.21 class XMLNotationMBS

3.21.1 class XMLNotationMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This interface represents a notation declared in the DTD.

Notes: A notation either declares, by name, the format of an unparsed entity (see section 4.7 of the XML 1.0 specification), or is used for formal declaration of Processing Instruction targets (see section 2.6 of the XML 1.0 specification). The nodeName attribute inherited from XMLNodeMBS is set to the declared name of the notation.

The DOM Level 1 does not support editing XMLNotationMBS nodes; they are therefore readonly.

A XMLNotationMBS node does not have any parent.

Subclass of the XMLNodeMBS class.

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

3.21.2 Properties

3.21.3 PublicId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Get the public identifier of this notation.

Notes: If the public identifier was not specified, this is "".

(Read only property)

3.21.4 SystemId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Get the system identifier of this notation.

Notes: If the system identifier was not specified, this is "".

(Read only property)

3.22 class XMLOutputMBS

3.22.1 class XMLOutputMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This interface represents an output destination for data.

Example:

```
Dim output As New XMLOutputMBS
output.Encoding = "UTF-8"
```

```
// now pass to write method in XMLSerializerMBS class
```

3.22.2 Methods

3.22.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.22.4 Properties

3.22.5 Encoding as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The encoding which will be required for use with the XML text read via a stream opened by this input source.

Example:

```
Dim output As New XMLOutputMBS
output.Encoding = "UTF-8"
```

```
// now pass to write method in XMLSerializerMBS class
```

Notes: This is usually not set, allowing the encoding to be sensed in the usual XML way. However, in some cases, the encoding in the file is known to be incorrect because of intermediate transcoding, for instance encapsulation within a MIME document.

Pass the name of the encoding to force, e.g. "UTF-8".
(Read and Write property)

3.22.6 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.22.7 SystemId as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The system identifier for this input source.

Notes: The system id is always required. The public id may be used to map to another system id, but the system id must always be present as a fall back.

If the system ID is a URL, it must be fully resolved.
(Read and Write property)

3.23 class XMLParserFilterMBS

3.23.1 class XMLParserFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XML parser filter class.

Notes: The XMLParserFilterMBS class provide applications the ability to examine nodes as they are being created during the parse process.

And it lets the application decide what nodes should be in the output DOM tree or not.

3.23.2 Methods

3.23.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.23.4 Destructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The destructor.

3.23.5 Events

3.23.6 acceptNode(node as XMLNodeMBS) as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

Function: This eventn will be called by the parser at the completion of the parsing of each node.

Notes: The node and all of its descendants will exist and be complete. The parent node will also exist, although it may be incomplete, i.e. it may have additional children that have not yet been parsed. Attribute nodes are never passed to this function. From within this method, the new node may be freely modified - children may be added or removed, text nodes modified, etc. The state of the rest of the document outside this node is not defined, and the affect of any attempt to navigate to, or to modify any other part of the document is undefined. For validating parsers, the checks are made on the original document, before any modification by the filter. No validity checks are made on any document modifications made by the filter. If this new node is rejected, the parser might reuse the new node and any of its descendants.

node: The newly constructed element. At the time this method is called, the element is complete - it has all of its children (and their children, recursively) and attributes, and is attached as a child to its parent.

Return one of the Filter* constants.

3.23.7 getWhatToShow as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

Function: Tells the XMLParserMBS what types of nodes to show to the acceptNode event.

Notes: If a node is not shown to the filter using this attribute, it is automatically included in the DOM document being built. See XMLDocumentMBS for definition of the constants.

3.23.8 startElement(node as XMLElementMBS) as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

Function: The parser will call this method after each XMLElementMBS start tag has been scanned, but before the remainder of the XMLElementMBS is processed.

Notes: The intent is to allow the element, including any children, to be efficiently skipped. Note that only element nodes are passed to the startElement function. The element node passed to startElement for filtering will include all of the attributes, but none of the children nodes. The XMLElementMBS may not yet be in place in the document being constructed (it may not have a parent node.) A startElement filter function may access or change the attributes for the XMLElementMBS. Changing namespace declarations will have no effect on namespace resolution by the parser.

node: The newly encountered element. At the time this method is called, the element is incomplete - it will have its attributes, but no children.

Return one of the Filter* constants.

3.23.9 Constants

Filter Actions

Constant	Value	Description
FilterAccept	1	Accept the node.
FilterInterrupt	4	Interrupt the normal processing of the document.
FilterReject	2	Reject the node and its children.
FilterSkip	3	Skip this single node. The children of this node will still be considered.

3.24 class XMLParserMBS

3.24.1 class XMLParserMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLParserMBS class provides an API for parsing XML documents and building the corresponding DOM document tree.

Example:

```
Dim p As New XMLParserMBS
```

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.xml")
```

```
Dim doc As XMLDocumentMBS = p.parseFile(f)
```

```
// inspect document in debugger
```

```
MessageBox doc.NodeName
```

Notes: Please note that asynchronous mode is not yet supported in MBS Plugin.

Blog Entries

- [MBS Xojo Plugins in version 22.4](#)

Xojo Developer Magazine

- [20.6, page 8: News](#)

3.24.2 Methods

3.24.3 abort

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Abort the loading of the document that is currently being loaded by the XMLParserMBS.

Notes: If the XMLParserMBS is currently not busy, a call to this method does nothing.

invoking this method will remove the installed filter

3.24.4 Constructor(Asynchronous as Boolean = false, schemaType as string = "")

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Create a new XMLParserMBS.

Notes: The newly constructed parser may then be configured by means of its XMLConfigurationMBS ob-

ject, and used to parse documents by means of its parse method.

async: The mode argument is either synchronous or asynchronous, if `async` is true then the `XMLParserMBS` that is created will operate in synchronous mode, if `async` is false then the `XMLParserMBS` that is created will operate in asynchronous mode.

schemaType: An absolute URI representing the type of the schema language used during the load of a `XMLDocumentMBS` using the newly created `XMLParserMBS`. Note that no lexical checking is done on the absolute URI. In order to create a `XMLParserMBS` for any kind of schema types (i.e. the `XMLParserMBS` will be free to use any schema found), use the value `""`.

Note: For W3C XML Schema [XML Schema Part 1], applications must use the value `"http://www.w3.org/2001/XMLSchema"`. For XML DTD [XML 1.0], applications must use the value `"http://www.w3.org/TR/REC-xml"`. Other Schema languages are outside the scope of the W3C and therefore should recommend an absolute URI in order to use this method.

3.24.5 parse(inputSource as XMLInputMBS) as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Parse an XML document from a resource identified by a `XMLInputMBS`.

Example:

```
Dim xmlText As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
```

```
Dim Input As New XMLInputMBS
```

```
Input.Encoding = "UTF-8"
```

```
Input.InputString = xmlText
```

```
Dim parser As New XMLParserMBS
```

```
Dim doc As XMLDocumentMBS = parser.parse(Input)
```

```
// inspect document in debugger
```

```
MessageBox doc.toString
```

Notes: The parser owns the returned `XMLDocumentMBS`. It will be deleted when the parser is released.

source: The `XMLInputMBS` from which the source of the document is to be read.

If the `XMLParserMBS` is a synchronous `XMLParserMBS` the newly created and populated `XMLDocumentMBS` is returned.

If the `XMLParserMBS` is asynchronous then `nil` is returned since the document object may not yet be constructed when this method returns.

3.24.6 parseFile(file as FolderItem) as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Parses a file.

Example:

```
Dim p As New XMLParserMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.xml")

Dim doc As XMLDocumentMBS = p.parseFile(f)

// inspect document in debugger
MessageBox doc.NodeName
```

3.24.7 parseURI(URI as String) as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Parse an XML document from a location identified by a URI reference [IETF RFC 2396] .

Notes: If the URI contains a fragment identifier (see section 4.1 in [IETF RFC 2396]), the behavior is not defined by this specification, future versions of this specification may define the behavior.

The parser owns the returned XMLDocumentMBS. It will be deleted when the parser is released.

uri: The location of the XML document to be read (in Unicode)

If the XMLParserMBS is a synchronous XMLParserMBS the newly created and populated XMLDocumentMBS is returned.

If the XMLParserMBS is asynchronous then nil is returned since the document object is not yet parsed when this method returns.

3.24.8 parseWithContext(inputSource as XMLInputMBS, contextNode as XMLNodeMBS, Action as Integer) as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Parse an XML fragment from a resource identified by a XMLInputMBS and insert the content into an existing document at the position specified with the context and action arguments.

Example:

```

Dim xmlText As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"

Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = xmlText

Dim parser As New XMLParserMBS

Dim doc As New XMLDocumentMBS("", "MyDocument")

// load new test node into the MyDocument
Dim newNode As XMLNodeMBS = parser.parseWithContext(Input, doc.DocumentElement, parser.Action-
AppendAsChildren)

// inspect document in debugger
MessageBox doc.toString

```

Notes: When parsing the input stream, the context node (or its parent, depending on where the result will be inserted) is used for resolving unbound namespace prefixes. The context node's ownerDocument node (or the node itself if the node of type document) is used to resolve default attributes and entity references. As the new data is inserted into the document, at least one mutation event is fired per new immediate child or sibling of the context node. If the context node is a XMLDocumentMBS node and the action is ActionReplaceChildren, then the document that is passed as the context node will be changed such that its xmlEncoding, documentURL, xmlVersion, inputEncoding, xmlStandalone, and all other such attributes are set to what they would be set to if the input source was parsed using parse(). This method is always synchronous, even if the XMLParserMBS is asynchronous (when Async() returns true). If an error occurs while parsing, the caller is notified through the ErrorHandler instance associated with the "error-handler" parameter of the XMLConfigurationMBS. When calling parseWithContext, the values of the following configuration parameters will be ignored and their default values will always be used instead: "validate", "validate-if-schema" "element-content-whitespace". Other parameters will be treated normally, and the parser is expected to call the XMLParserMBSFilter just as if a whole document was parsed.

source: The XMLInputMBS from which the source document is to be read. The source document must be an XML fragment, i.e. anything except a complete XML document (except in the case where the context node of type DOCUMENT_NODE, and the action is ActionReplaceChildren), a DOCTYPE (internal subset), entity declaration(s), notation declaration(s), or XML or text declaration(s).

contextNode: The node that is used as the context for the data that is being parsed. This node must be a XMLDocumentMBS node, a XMLDocumentFragmentMBS node, or a node of a type that is allowed as a child of an XMLElementMBS node, e.g. it cannot be an XMLAttributeMBS node.

action: This parameter describes which action should be taken between the new set of nodes being inserted and the existing children of the context node. The set of possible actions is defined in action constants.

Return the node that is the result of the parse operation. If the result is more than one top-level node,

the first one is returned.

3.24.9 resetCachedGrammarPool

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Clear the cached grammar pool.

3.24.10 resetDocumentPool

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Reset the documents vector pool and release all the associated memory back to the system.

Notes: When parsing a document using a DOM parser, all memory allocated for a DOM tree is associated to the DOM document.

If you do multiple parse using the same DOM parser instance, then multiple DOM documents will be generated and saved in a vector pool. All these documents (and thus all the allocated memory) won't be deleted until the parser instance is destroyed.

If you don't need these DOM documents anymore and don't want to destroy the DOM parser instance at this moment, then you can call this method to reset the document vector pool and release all the allocated memory back to the system.

It is an error to call this method if you are in the middle of a parse (e.g. in the mid of a progressive parse).

3.24.11 URIText(ID as Integer) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the string corresponding to a URI id from the URI string pool.

Notes: ID: id of the string in the URI string pool.

Returns the URI string corresponding to the URI id.

3.24.12 Properties

3.24.13 Asynchronous as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Return whether the parser is asynchronous.

Notes: Value is true if the XMLParserMBS is asynchronous and false if it is synchronous.

(Read only property)

3.24.14 Busy as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Return whether the parser is busy parsing.

Notes: Value is true if the XMLParserMBS is currently busy loading a document, otherwise false.

(Read only property)

3.24.15 DOMConfig as XMLConfigurationMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Get a pointer to the XMLConfigurationMBS object used when parsing an input source.

Example:

```
Dim parser As New XMLParserMBS

// configure the parser
Dim DOMConfig As XMLConfigurationMBS = p.DOMConfig
DOMConfig.ElementContentWhitespace=False

// prepare XML input
Dim Input As New XMLInputMBS
Input.InputString = kXML2

// and parse
Var xml1 As XMLDocumentMBS = p.parse(Input)

Break
```

Notes: This XMLConfigurationMBS is specific to the parse operation.

No parameter values from this XMLConfigurationMBS object are passed automatically to the XMLConfigurationMBS object on the XMLDocumentMBS that is created, or used, by the parse operation. The DOM application is responsible for passing any needed parameter values from this XMLConfigurationMBS object

to the XMLConfigurationMBS object referenced by the XMLDocumentMBS object.
(Read only property)

3.24.16 Filter as XMLParserFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The parse filter.

Notes: When the application provides a filter, the parser will call out to the filter at the completion of the construction of each XMLElementMBS node. The filter implementation can choose to remove the element from the document being constructed or to terminate the parse early. The filter is invoked after the operations requested by the XMLConfigurationMBS parameters have been applied. For example, if "validate" is set to true, the validation is done before invoking the filter.

Currently filter can only work in synchronous mode.
(Read and Write property)

3.24.17 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.24.18 SrcOffset as Int64

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the current src offset within the input source.

Notes: (Read only property)

3.24.19 Constants

Actions

Constant	Value	Description
ActionAppendAsChildren	1	Append the result of the parse operation as children of the context node. For this action to work, the context node must be a <code>XMLElementMBS</code> or a <code>XMLDocumentFragmentMBS</code> .
ActionInsertAfter	4	Insert the result of the parse operation as the immediately following sibling of the context node. For this action to work the context node's parent must be a <code>XMLElementMBS</code> or a <code>XMLDocumentFragmentMBS</code> .
ActionInsertBefore	3	Insert the result of the parse operation as the immediately preceding sibling of the context node. For this action to work the context node's parent must be a <code>XMLElementMBS</code> or a <code>XMLDocumentFragmentMBS</code> .
ActionReplace	5	Replace the context node with the result of the parse operation. For this action to work, the context node must have a parent, and the parent must be a <code>XMLElementMBS</code> or a <code>XMLDocumentFragmentMBS</code> .
ActionReplaceChildren	2	Replace all the children of the context node with the result of the parse operation. For this action to work, the context node must be a <code>XMLElementMBS</code> , a <code>XMLDocumentMBS</code> , or a <code>XMLDocumentFragmentMBS</code> .

3.25 class XMLProcessingInstructionMBS

3.25.1 class XMLProcessingInstructionMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The DOMProcessingInstruction interface represents a "processing instruction", used in XML as a way to keep processor-specific information in the text of the document.

Notes: Subclass of the XMLNodeMBS class.

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

3.25.2 Methods

3.25.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.25.4 Properties

3.25.5 Data as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The content of this processing instruction.

Notes: This is from the first non white space character after the target to the character immediately preceding the ?<.

Can be set to put in new instruction.
(Read and Write property)

3.25.6 Target as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The target of this processing instruction.

Notes: XML defines this as being the first token following the markup that begins the processing instruction.

(Read only property)

3.26 class XMLSerializerFilterMBS

3.26.1 class XMLSerializerFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: XMLSerializerMBSFilter provide applications the ability to examine nodes as they are being serialized.

Notes: XMLSerializerMBSFilter lets the application decide what nodes should be serialized or not.

The XMLDocumentMBS, XMLDocumentTypeMBS, XMLNotationMBS, and XMLEntityMBS nodes are not passed to the filter.

3.26.2 Methods

3.26.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.26.4 Destructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The destructor.

3.26.5 Events

3.26.6 acceptNode(node as XMLNodeMBS) as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

Function: Test whether a specified node is visible in the logical view of a XMLTreeWalkerMBS or XMLNodeIteratorMBS.

Notes: This event will be called by the implementation of XMLTreeWalkerMBS and XMLNodeIteratorMBS; it is not normally called directly from user code. (Though you could do so if you wanted to use the same filter to guide your own application logic.)

node: The node to check to see if it passes the filter or not.

A constant to determine whether the node is accepted, rejected, or skipped, as defined above.

3.26.7 getWhatToShow as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

Function: Tells the XMLSerializerMBS what types of nodes to show to the filter.

Notes: See XMLNodeFilterMBS for definition of the constants. The constant SHOW_ATTRIBUTE is meaningless here, attribute nodes will never be passed to a XMLSerializerMBSFilter.

The constants of what types of nodes to show.
Default is ShowAll if event is not implemented.

3.26.8 Constants

Filter Results

Constant	Value	Description
FilterAccept	1	Accept the node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will return this node.
FilterReject	2	Reject the node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will not return this node. For XMLTreeWalkerMBS, the children of this node will also be rejected. XMLNodeIteratorMBSs treat this as a synonym for FilterSkip.
FilterSkip	3	Skip this single node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will not return this node. For both XMLNodeIteratorMBS and XMLTreeWalkerMBS, the children of this node will still be considered.

3.27 class XMLSerializerMBS

3.27.1 class XMLSerializerMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: XMLSerializerMBS provides an API for serializing (writing) a DOM document out in an XML document.

Notes: The XML data is written to an output stream, the type of which depends on the specific language bindings in use. During serialization of XML data, namespace fixup is done when possible.

XMLSerializerMBS accepts any node type for serialization. For nodes of type Document or Entity, well formed XML will be created if possible. The serialized output for these node types is either as a Document or an External Entity, respectively, and is acceptable input for an XML parser. For all other types of nodes the serialized form is not specified, but should be something useful to a human for debugging or diagnostic purposes. Note: rigorously designing an external (source) form for stand-alone node types that don't already have one defined in seems a bit much to take on here.

Within a Document or Entity being serialized, Nodes are processed as follows Documents are written including an XML declaration and a DTD subset, if one exists in the DOM. Writing a document node serializes the entire document. Entity nodes, when written directly by write defined in the XMLSerializerMBS interface, output the entity expansion but no namespace fixup is done. The resulting output will be valid as an external entity. Entity References nodes are serializes as an entity reference of the form "&entityName;") in the output. Child nodes (the expansion) of the entity reference are ignored. CDATA sections containing content characters that can not be represented in the specified output encoding are handled according to the "split-cdata-sections" feature.If the feature is true, CDATA sections are split, and the unrepresentable characters are serialized as numeric character references in ordinary content. The exact position and number of splits is not specified. If the feature is false, unrepresentable characters in a CDATA section are reported as errors. The error is not recoverable - there is no mechanism for supplying alternative characters and continuing with the serialization. All other node types (XMLElementMBS, XMLTextMBS, etc.) are serialized to their corresponding XML source form.

Within the character data of a document (outside of markup), any characters that cannot be represented directly are replaced with character references. Occurrences of '<' and '&' are replaced by the predefined entities < and &. The other predefined entities (>, ', etc.) are not used; these characters can be included directly. Any character that can not be represented directly in the output character encoding is serialized as a numeric character reference.

Attributes not containing quotes are serialized in quotes. Attributes containing quotes but no apostrophes are serialized in apostrophes (single quotes). Attributes containing both forms of quotes are serialized in quotes, with quotes within the value represented by the predefined entity ". Any character that can not be represented directly in the output character encoding is serialized as a numeric character reference.

Within markup, but outside of attributes, any occurrence of a character that cannot be represented in the output character encoding is reported as an error. An example would be serializing the element with the encoding="us-ascii".

When requested by setting the `normalize-characters` feature on `XMLSerializerMBS`, all data to be serialized, both markup and character data, is W3C Text normalized according to the rules defined in . The W3C Text normalization process affects only the data as it is being written; it does not alter the DOM's view of the document after serialization has completed.

Namespaces are fixed up during serialization, the serialization process will verify that namespace declarations, namespace prefixes and the namespace URIs associated with Elements and Attributes are consistent. If inconsistencies are found, the serialized form of the document will be altered to remove them. The algorithm used for doing the namespace fixup while serializing a document is a combination of the algorithms used for `lookupNamespaceURI` and `lookupPrefix`. previous paragraph to be defined closer here.

Any changes made affect only the namespace prefixes and declarations appearing in the serialized data. The DOM's view of the document is not altered by the serialization operation, and does not reflect any changes made to namespace declarations or prefixes in the serialized output.

While serializing a document the serializer will write out non-specified values (such as attributes whose `specified` is false) if the `output-default-values` feature is set to true. If the `output-default-values` flag is set to false and the `use-abstract-schema` feature is set to true the abstract schema will be used to determine if a value is specified or not, if `use-abstract-schema` is not set the `specified` flag on attribute nodes is used to determine if attribute values should be written out.

Ref to Core spec (1.1.9, XML namespaces, 5th paragraph) entity ref description about warning about unbound entity refs. Entity refs are always serialized as `&foo;`, also mention this in the load part of this spec. When serializing a document the `XMLSerializerMBS` checks to see if the document element in the document is a DOM Level 1 element or a DOM Level 2 (or higher) element (this check is done by looking at the `localName` of the root element). If the root element is a DOM Level 1 element then the `XMLSerializerMBS` will issue an error if a DOM Level 2 (or higher) element is found while serializing. Likewise if the document element is a DOM Level 2 (or higher) element and the `XMLSerializerMBS` sees a DOM Level 1 element an error is issued. Mixing DOM Level 1 elements with DOM Level 2 (or higher) is not supported.

`XMLSerializerMBS`s have a number of named features that can be queried or set. The name of `XMLSerializerMBS` features must be valid XML names. Implementation specific features (extensions) should choose an implementation dependent prefix to avoid name collisions.

Here is a list of properties that must be recognized by all implementations.

`"normalize-characters"`

true: [optional] (default) Perform the W3C Text Normalization of the characters in document as they are written out. Only the characters being written are (potentially) altered. The DOM document itself is unchanged.

false: [required] do not perform character normalization.

`"split-cdata-sections"`

true: [required] (default) Split CDATA sections containing the CDATA section termination marker ']] >' or characters that can not be represented in the output encoding, and output the characters using numeric character references. If a CDATA section is split a warning is issued.

false: [required] Signal an error if a `CDATASection` contains an unrepresentable character.

`"validation"`

true: [optional] Use the abstract schema to validate the document as it is being serialized. If valida-

tion errors are found the error handler is notified about the error. Setting this state will also set the feature `use-abstract-schema` to true.

false: [required] (default) Don't validate the document as it is being serialized.

"expand-entity-references"

true: [optional] Expand EntityReference nodes when serializing.

false: [required] (default) Serialize all EntityReference nodes as XML entity references.

"whitespace-in-element-content"

true: [required] (default) Output all white spaces in the document.

false: [optional] Only output white space that is not within element content. The implementation is expected to use the `isWhitespaceInElementContent` flag on Text nodes to determine if a text node should be written out or not.

"discard-default-content"

true: [required] (default) Use whatever information available to the implementation (i.e. XML schema, DTD, the specified flag on Attr nodes, and so on) to decide what attributes and content should be serialized or not. Note that the specified flag on Attr nodes in itself is not always reliable, it is only reliable when it is set to false since the only case where it can be set to false is if the attribute was created by a Level 1 implementation.

false: [required] Output all attributes and all content.

"format-canonical"

true: [optional] This formatting writes the document according to the rules specified in . Setting this feature to true will set the feature "format-pretty-print" to false.

false: [required] (default) Don't canonicalize the output.

"format-pretty-print"

true: [optional] Formatting the output by adding whitespace to produce a pretty-printed, indented, human-readable form. The exact form of the transformations is not specified by this specification. Setting this feature to true will set the feature "format-canonical" to false.

false: [required] (default) Don't pretty-print the result.

"byte-order-mark"

false: [optional] (default) Setting this feature to true will output the correct BOM for the specified encoding.

true: [required] Don't generate a BOM.

"space-first-level-elements"

true: [optional] (default) Setting this feature to true will add an extra line feed between the elements that are children of the document root.

false: [required] Don't add the extra line feed.

3.27.2 Methods

3.27.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The constructor.

3.27.4 writeToBuffer(Node as XMLNodeMBS, output as XMLOutputMBS) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Write out the specified node as described above in the description of XMLSerializerMBS.

Example:

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

// options
serializer.NewLine = EndOfLine.macOS

Dim output As New XMLOutputMBS
output.Encoding = "UTF-8"

// and output to string
Dim s As String = serializer.writeToBuffer(doc, output)
```

Notes: Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The Document or Entity node to be written. For other node types, something sensible should be written, but the exact serialized form is not specified.

output: The output for the data to be written.

Returns XML if node was successfully serialized and false in case a failure occurred and the failure wasn't canceled by the error handler.

We internally create a memory buffer to output to and return you the output.

3.27.5 writeToFile(Node as XMLNodeMBS, File as FolderItem) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Write out the specified node as described above in the description of XMLSerializerMBS.

Example:

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.xml")

// and output to string
Dim r As Boolean = serializer.writeToFile(doc, file)
```

Notes: Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The Document or Entity node to be written. For other node types, something sensible should be written, but the exact serialized form is not specified.

uri: The destination for the data to be written.

Returns true if node was successfully serialized and false in case a failure occurred and the failure wasn't canceled by the error handler.

3.27.6 toString(Node as XMLNodeMBS) as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Serialize the specified node as described above in the description of XMLSerializerMBS.

Example:

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

// options
serializer.NewLine = EndOfLine.macOS

// and output to string
Dim s As String = serializer.writeToString(doc)
```

Notes: The result of serializing the node is returned as a string. Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The node to be written.

Returns the serialized data, or "" in case a failure occurred and the failure wasn't canceled by the error handler. The returned string is always marked as UTF-16.

3.27.7 writeToURI(Node as XMLNodeMBS, URI as String) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Write out the specified node as described above in the description of XMLSerializerMBS.

Example:

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.xml")

// and output to string
Dim r As Boolean = serializer.writeToURI(doc, file.NativePath)
```

Notes: Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The Document or Entity node to be written. For other node types, something sensible should be written, but the exact serialized form is not specified.

uri: The destination for the data to be written.

Returns true if node was successfully serialized and false in case a failure occurred and the failure wasn't canceled by the error handler.

3.27.8 Properties

3.27.9 DOMConfig as XMLConfigurationMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLConfigurationMBS object used by the Serializer when serializing a DOM node.

Notes: (Read only property)

3.27.10 Filter as XMLSerializerFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The filter to decide which elements to output.

Notes: When the application provides a filter, the serializer will call out to the filter before serializing each Node. Attribute nodes are never passed to the filter. The filter implementation can choose to remove the node from the stream or to terminate the serialization early.

filter: The writer filter to be used.

(Read and Write property)

3.27.11 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.27.12 NewLine as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The end-of-line sequence of characters to be used in the XML being written out.

Notes: The only permitted values are these: ""

Use a default end-of-line sequence. DOM implementations should choose the default to match the usual convention for text files in the environment being used. Implementations must choose a default sequence that matches one of those allowed by 2.11 "End-of-Line Handling". However, Xerces-C++ always uses LF when this property is set to nil since otherwise automatic translation of LF to CR-LF on Windows for text files would result in such files containing CR-CR-LF. If you need Windows-style end of line sequences in your output, consider writing to a file opened in text mode or explicitly set this property to CR-LF.

The default value for this attribute is "" to use default.

(Read and Write property)

3.28 class XMLTextMBS

3.28.1 class XMLTextMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for a piece of XML text.

Notes: The XMLTextMBS interface inherits from XMLCharacterDataMBS and represents the textual content (termed character data in XML) of an XMLElementMBS or XMLAttributeMBS. If there is no markup inside an element's content, the text is contained in a single object implementing the XMLTextMBS interface that is the only child of the element. If there is markup, it is parsed into the information items (elements, comments, etc.) and XMLTextMBS nodes that form the list of children of the element.

When a document is first made available via the DOM, there is only one XMLTextMBS node for each block of text. Users may create adjacent XMLTextMBS nodes that represent the contents of a given element without any intervening markup, but should be aware that there is no way to represent the separations between these nodes in XML or HTML, so they will not (in general) persist between DOM editing sessions. The `normalize()` method on XMLNodeMBS merges any such adjacent XMLTextMBS objects into a single node for each block of text.

Subclass of the XMLCharacterDataMBS class.

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

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- [21.2, pages 68 to 69: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes](#)

3.28.2 Methods

3.28.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.28.4 `splitText(Offset as Integer)` as XMLTextMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Breaks this node into two nodes at the specified offset, keeping both in the tree as siblings.

Notes: After being split, this node will contain all the content up to the offset point. A new node of the same type, which contains all the content at and after the offset point, is returned. If the original node had a parent node, the new node is inserted as the next sibling of the original node. When the offset is equal to the length of this node, the new node has no data.

offset: The 16-bit unit offset at which to split, starting from 0.

Returns the new node, of the same type as this node.

Raises exception in case of error.

3.28.5 Properties

3.28.6 IsElementContentWhitespace as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns whether this text node contains element content whitespace, often abusively called "ignorable whitespace".

Notes: The text node is determined to contain whitespace in element content during the load of the document or if validation occurs while using `normalizeDocument()`.

(Read only property)

3.28.7 WholeText as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns all text of DOMText nodes logically-adjacent text nodes to this node, concatenated in document order.

Notes: When assigned, substitutes the a specified text for the text of the current node and all logically-adjacent text nodes.

(Read and Write property)

3.29 class XMLTreeWalkerMBS

3.29.1 class XMLTreeWalkerMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Allows you to walk over a xml tree.

Notes: XMLTreeWalkerMBS objects are used to navigate a document tree or subtree using the view of the document defined by their whatToShow flags and filter (if any). Any function which performs navigation using a XMLTreeWalkerMBS will automatically support any view defined by a XMLTreeWalkerMBS.

Omitting nodes from the logical view of a subtree can result in a structure that is substantially different from the same subtree in the complete, unfiltered document. Nodes that are siblings in the XMLTreeWalkerMBS view may be children of different, widely separated nodes in the original view. For instance, consider a XMLNodeFilterMBS that skips all nodes except for XMLTextMBS nodes and the root node of a document. In the logical view that results, all text nodes will be siblings and appear as direct children of the root node, no matter how deeply nested the structure of the original document.

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

Blog Entries

- [MBS Xojo Plugins in version 22.4](#)
- [New XML Plugin for Xojo](#)

Xojo Developer Magazine

- [20.6, page 9: News](#)

3.29.2 Methods

3.29.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.29.4 firstChild as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves the XMLTreeWalkerMBS to the first visible child of the current node, and returns the new node.

Notes: If the current node has no visible children, returns null, and retains the current node.

The new node, or null if the current node has no visible children in the XMLTreeWalkerMBS's logical view.

3.29.5 lastChild as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves the XMLTreeWalkerMBS to the last visible child of the current node, and returns the new node.

Notes: If the current node has no visible children, returns null, and retains the current node. The new node, or null if the current node has no children in the XMLTreeWalkerMBS's logical view.

3.29.6 nextNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves the XMLTreeWalkerMBS to the next visible node in document order relative to the current node, and returns the new node.

Notes: If the current node has no next node, or if the search for nextNode attempts to step upward from the XMLTreeWalkerMBS's root node, returns null, and retains the current node.

The new node, or null if the current node has no next node in the XMLTreeWalkerMBS's logical view.

3.29.7 nextSibling as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves the XMLTreeWalkerMBS to the next sibling of the current node, and returns the new node.

Notes: If the current node has no visible next sibling, returns null, and retains the current node. The new node, or null if the current node has no next sibling. in the XMLTreeWalkerMBS's logical view.

3.29.8 parentNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves to and returns the closest visible ancestor node of the current node.

Notes: If the search for parentNode attempts to step upward from the XMLTreeWalkerMBS's root node, or if it fails to find a visible ancestor node, this method retains the current position and returns null.

The new parent node, or null if the current node has no parent in the XMLTreeWalkerMBS's logical view.

3.29.9 previousNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves the XMLTreeWalkerMBS to the previous visible node in document order relative to the current node, and returns the new node.

Notes: If the current node has no previous node, or if the search for previousNode attempts to step upward from the XMLTreeWalkerMBS's root node, returns null, and retains the current node.

The new node, or null if the current node has no previous node in the XMLTreeWalkerMBS's logical view.

3.29.10 previousSibling as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Moves the XMLTreeWalkerMBS to the previous sibling of the current node, and returns the new node.

Notes: If the current node has no visible previous sibling, returns null, and retains the current node.

The new node, or null if the current node has no previous sibling. in the XMLTreeWalkerMBS's logical view.

3.29.11 Properties

3.29.12 CurrentNode as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Return the node at which the XMLTreeWalkerMBS is currently positioned.

Notes: Can be assigned to move:

The node at which the XMLTreeWalkerMBS is currently positioned.

Alterations to the DOM tree may cause the current node to no longer be accepted by the XMLTreeWalkerMBS's associated filter. currentNode may also be explicitly set to any node, whether or not it is within the subtree specified by the root node or would be accepted by the filter and whatToShow flags. Further traversal occurs relative to currentNode even if it is not part of the current view, by applying the filters in the requested direction; if no traversal is possible, currentNode is not changed.

(Read and Write property)

3.29.13 Document as XMLDocumentMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The owning document.

Notes: (Read only property)

3.29.14 ExpandEntityReferences as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The value of this flag determines whether the children of entity reference nodes are visible to the XMLTreeWalkerMBS.

Notes: If false, these children and their descendants will be rejected. Note that this rejection takes precedence over whatToShow and the filter, if any.
To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the whatToShow flags to hide the entity reference node and set expandEntityReferences to true when creating the XMLTreeWalkerMBS. To produce a view of the document that has entity reference nodes but no entity expansion, use the whatToShow flags to show the entity reference node and set expandEntityReferences to false.
(Read only property)

3.29.15 Filter as XMLNodeFilterMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The filter used to screen nodes.

Notes: (Read only property)

3.29.16 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.29.17 Root as XMLNodeMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The root node of the DOMTreeWalker, as specified when it was created.

Notes: (Read only property)

3.29.18 WhatToShow as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This attribute determines which node types are presented via the DOMTreeWalker.

Notes: The available set of constants is defined in the DOMNodeFilter interface. Nodes not accepted by whatToShow will be skipped, but their children may still be considered. Note that this skip takes precedence over the filter, if any.

Default is ShowAll.

3.30 class XMLTypeInfoMBS

3.30.1 class XMLTypeInfoMBS

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The XMLTypeInfoMBS interface represent a type used by XMLElementMBS or XMLAttributeMBS nodes, specified in the schemas associated with the document.

Notes: The type is a pair of a namespace URI and name properties, and depends on the document's schema. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

3.30.2 Methods

3.30.3 Constructor

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.30.4 isDerivedFrom(typeNamespaceArg as String, typeNameArg as String, derivationMethod as Integer) as Boolean

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: This method returns if there is a derivation between the reference type definition, i.e. the XMLTypeInfoMBS on which the method is being called, and the other type definition, i.e. the one passed as parameters.

Notes: typeNamespaceArg: The namespace of the other type definition.

typeNameArg: The name of the other type definition.

derivationMethod: The type of derivation and conditions applied between two types, as described in the list of constants provided in this interface.

If the document's schema is a DTD or no schema is associated with the document, this method will always return false.

If the document's schema is an XML Schema, the method will true if the reference type definition is derived from the other type definition according to the derivation parameter. If the value of the parameter is 0 (no bit is set to 1 for the derivationMethod parameter), the method will return true if the other type definition can be reached by recursing any combination of { base type definition } , { item type definition } , or { member type definitions } from the reference type definition.

3.30.5 Properties

3.30.6 Handle as Integer

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

3.30.7 TypeName as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns The name of a type declared for the associated XMLElementMBS or XMLAttributeMBS, or "" if unknown.

Notes: (Read only property)

3.30.8 TypeNamespace as String

Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The namespace of the type declared for the associated XMLElementMBS or XMLAttributeMBS or "" if the XMLElementMBS does not have declaration or if no namespace information is available.

Notes: (Read only property)

3.30.9 Constants

DerivationMethods

Constant	Value	Description
DerivationExtension	2	If the document's schema is an XML Schema [XML Schema Part 1] , this constant represents the derivation by extension. The reference type definition is derived by extension from the other type definition if the other type definition can be reached recursively following the { base type definition } property from the reference type definition, and at least one of the derivation methods involved is an extension.
DerivationList	8	If the document's schema is an XML Schema [XML Schema Part 1] , this constant represents the list. The reference type definition is derived by list from the other type definition if there exists two type definitions T1 and T2 such as the reference type definition is derived from T1 by DerivationRestriction or DerivationExtension, T2 is derived from the other type definition by DerivationRestriction, T1 has { variety } list, and T2 is the { item type definition } . Note that T1 could be the same as the reference type definition, and T2 could be the same as the other type definition.
DerivationRestriction	1	If the document's schema is an XML Schema [XML Schema Part 1] , this constant represents the derivation by restriction if complex types are involved, or a restriction if simple types are involved. The reference type definition is derived by restriction from the other type definition if the other type definition is the same as the reference type definition, or if the other type definition can be reached recursively following the { base type definition } property from the reference type definition, and all the derivation methods involved are restriction.
DerivationUnion	4	If the document's schema is an XML Schema [XML Schema Part 1] , this constant represents the union if simple types are involved. The reference type definition is derived by union from the other type definition if there exists two type definitions T1 and T2 such as the reference type definition is derived from T1 by DerivationRestriction or DerivationExtension, T2 is derived from the other type definition by DerivationRestriction, T1 has { variety } union, and one of the { member type definitions } is T2. Note that T1 could be the same as the reference type definition, and T2 could be the same as the other type definition.

3.31 class XMLXPathResultMBS

3.31.1 class XMLXPathResultMBS

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The class for an XPath result.

Notes: The DOMXPathResult interface represents the result of the evaluation of an XPath 1.0 or XPath 2.0 expression within the context of a particular node. Since evaluation of an XPath expression can result in various result types, this object makes it possible to discover and manipulate the type and value of the result.

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

Blog Entries

- [News from the MBS Xojo Plugins Version 23.3](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3](#)
- [MBS Xojo Plugins, version 23.3pr1](#)

Xojo Developer Magazine

- [21.5, page 10: News](#)

3.31.2 Methods

3.31.3 Constructor

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The private constructor.

3.31.4 iterateNext as Boolean

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Iterates and returns true if the current result is the next item from the sequence or false if there are no more items.

Notes: Returns True if the current result is the next item from the sequence or false if there are no more items.

Raises exception if ResultType is not ResultTypeUnorderedNodeIterator or ResultTypeOrderedNodeIterator (XPath 1.0) or if ResultType is not ResultTypeIteratorResult (XPath 2.0).

3.31.5 snapshotItem(size as Integer) as Boolean

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Sets the current result to the indexth item in the snapshot collection.

Notes: If index is greater than or equal to the number of items in the list, this method returns false. Unlike the iterator result, the snapshot does not become invalid, but may not correspond to the current document if it is mutated.

Returns true if the current result is the next item from the sequence or false if there are no more items.

Raises exception if ResultType is not ResultTypeUnorderedNodeSnapshot or ResultTypeOrderedNodeSnapshot (XPath 1.0) or if ResultType is not ResultTypeSnapshotResult (XPath 2.0).

3.31.6 Properties

3.31.7 BooleanValue as Boolean

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the boolean value of this result.

Notes: Raises exception if ResultType is not ResultTypeBoolean (XPath 1.0) or if current result cannot be properly converted to boolean (XPath 2.0).

Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

3.31.8 IntegerValue as Integer

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the integer value of this result (XPath 2 only).

Notes: The value of this integer result.

Raises exception if current result cannot be properly converted to int (XPath 2.0).

Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

3.31.9 InvalidIteratorState as Boolean

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Signifies that the iterator has become invalid.

Notes: True if ResultType is ResultTypeUnorderedNodeIterator or ResultTypeOrderedNodeIterator (XPath

1.0) or `ResultTypeIteratorResult` (XPath 2.0) and the document has been modified since this result was returned.

Raises exception if `ResultType` is not `ResultTypeUnorderedNodeIterator` or `ResultTypeOrderedNodeIterator` (XPath 1.0) or if `ResultType` is not `ResultTypeIteratorResult` (XPath 2.0).
(Read only property)

3.31.10 `isNode` as Boolean

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns true if the result has a current result and the value is a node (XPath 2 only).

Notes: This function is necessary to distinguish between a string value and a node of type string as returned by the `TypeInfo()` function.

(Read only property)

3.31.11 `NodeValue` as `XMLNodeMBS`

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the node value of this result.

Notes: The value of this node result, which may be nil.

Raises exception if `ResultType` is not `ResultTypeAnyUnorderedNode`, `ResultTypeFirstOrderedNode`, `ResultTypeUnorderedNodeIterator`, `ResultTypeOrderedNodeIterator`, `ResultTypeUnorderedNodeSnapshot`, or `ResultTypeOrderedNodeSnapshot` (XPath 1.0) or if current result is not a node (XPath 2.0). Raises exception if there is no current result in the result object.

(Read only property)

3.31.12 `NumberValue` as Double

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the number value of this result.

Notes: If the native double type of the DOM binding does not directly support the exact IEEE 754 result of the XPath expression, then it is up to the definition of the binding to specify how the XPath number is converted to the native binding number.

Raises exception if `ResultType` is not `ResultTypeNumber` (XPath 1.0) or if current result cannot be properly converted to double (XPath 2.0).

Raises exception if there is no current result in the result object (XPath 2.0).

(Read only property)

3.31.13 ResultType as Integer

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the result type of this result.

Notes: A code representing the type of this result, as defined by the type constants.
(Read only property)

3.31.14 SnapshotLength as Integer

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The number of items in the result snapshot.

Notes: Valid values for snapshotItem indices are 0 to snapshotLength-1 inclusive.

Raises exception if ResultType is not ResultTypeUnorderedNodeSnapshot or ResultTypeOrderedNodeSnapshot (XPath 1.0) or if ResultType is not ResultTypeSnapshotResult (XPath 2.0).
(Read only property)

3.31.15 StringValue as String

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the string value of this result.

Notes: The value of this string result.

Raises exception if ResultType is not ResultTypeString (XPath 1.0) or if current result cannot be properly converted to string (XPath 2.0).

Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

3.31.16 TypeInfo as XMLTypeInfoMBS

Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: Returns the DOM type info of the current result node or value (XPath 2 only).

Notes: (Read only property)

3.31.17 Constants

Result Types

Constant	Value	Description
ResultTypeAny	0	[XPath 1.0] This code does not represent a specific type. An evaluation of an XPath expression will never produce this type. If this type is requested then the evaluation returns whatever type naturally results from evaluation of the expression. If the natural result is a node set when ResultTypeAny was requested, then ResultTypeUnorderedNodeIterator is always the result type. Any other representation of a node set must be explicitly requested.
ResultTypeAnyUnorderedNode	8	[XPath 1.0] The result is a node set as defined by XPath 1.0 and will be accessed as a single node, which may be null if the node set is empty. Document modification does not invalidate the node, but may mean that the result no longer corresponds to the current document. This is a convenience that permits optimization since the implementation can stop once any node in the resulting set has been found. If there is more than one node in the actual result, the single node returned might not be the first in document order.
ResultTypeBoolean	3	[XPath 1.0] The result is a boolean as defined by XPath 1.0. Document modification does not invalidate the boolean, but may mean that reevaluation would not yield the same boolean.
ResultTypeFirstOrderedNode	9	[XPath 1.0] The result is a node set as defined by XPath 1.0 and will be accessed as a single node, which may be null if the node set is empty. Document modification does not invalidate the node, but may mean that the result no longer corresponds to the current document. This is a convenience that permits optimization since the implementation can stop once the first node in document order of the resulting set has been found. If there are more than one node in the actual result, the single node returned will be the first in document order.
ResultTypeFirstResult	100	[XPath 2.0] The result is a sequence as defined by XPath 2.0 and will be accessed as a single current value or there will be no current value if the sequence is empty. Document modification does not invalidate the value, but may mean that the result no longer corresponds to the current document. This is a convenience that permits optimization since the implementation can stop once the first item in the resulting sequence has been found. If there is more than one item in the actual result, the single item returned might not be the first in document order.
ResultTypeIteratorResult	101	[XPath 2.0] The result is a sequence as defined by XPath 2.0 that will be accessed iteratively. Document modification invalidates the iteration.
ResultTypeNumber	1	[XPath 1.0] The result is a number as defined by XPath 1.0. Document modification does not invalidate the number, but may mean that reevaluation would not yield the same number.
ResultTypeOrderedNodeIterator	5	[XPath 1.0] The result is a node set as defined by XPath 1.0 that will be accessed iteratively, which will produce document-ordered nodes. Document modification invalidates the iteration.
ResultTypeOrderedNodeSnapshot	7	[XPath 1.0] The result is a node set as defined by XPath 1.0 that will be accessed as a snapshot list of nodes that will be in original document order. Document modification does not invalidate the snapshot but may mean that reevaluation would not yield the same snapshot and nodes in the snapshot may have been altered, moved, or removed from the document.
ResultTypeSnapshotResult	102	[XPath 2.0] The result is a sequence as defined by XPath 2.0 that will be accessed as a snapshot list of values. Document modification does not invalidate the snapshot but may mean that reevaluation would not yield the same snapshot and any items in the snapshot may have been altered, moved, or removed from the document.
ResultTypeString	2	[XPath 1.0] The result is a string as defined by XPath 1.0. Document modification does not invalidate the string, but may mean that the string no longer corresponds to the current document.
ResultTypeUnorderedNodeIterator	4	[XPath 1.0] The result is a node set as defined by XPath 1.0 that will be accessed iteratively, which may not produce nodes in a particular order. Document modification invalidates the iteration. This is the default type returned if the result is a node set and ResultTypeAny is requested.
ResultTypeUnorderedNodeSnapshot	6	[XPath 1.0] The result is a node set as defined by XPath 1.0 that will be accessed as a snapshot list of nodes that will be in original document order.

Chapter 4

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Chapter 5

The FAQ

5.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sure, here's a routine I use (which has an advantage over the previously-posted Date-based solution in that you don't have to rely on the creation of an object – all that happens is some division and string concatenation):

Example:

```
Function SecsToTimeString(timeInSecs as Integer, padHours as boolean, padMinutes as boolean) as string
// Given an amount time (in seconds), generates a string representing that amount
// of time. The padHours and padMinutes parameters determine whether to display
// hours and minutes if their values are zero.
```

```
// Examples:
// timeInSecs = 90, padHours = true; returns "00:01:30"
// timeInSecs = 1, padHours = false, padMinutes = true; returns "00:01"
// timeInSecs = 3601, padMinutes = false; returns "01:00:01"
```

```
dim hours, minutes, seconds as Integer
dim hoursString, minutesString as string
```

```
hours = timeInSecs / 3600
minutes = (timeInSecs mod 3600) / 60
seconds = timeInSecs mod 60
```

```
if hours = 0 then
if padHours then
hoursString = "00:"
else
hoursString = ""
end if
```

```

else
hoursString = Format(hours, "##\:")
end if
if minutes = 0 then
if hours <>0 or padMinutes then
minutesString = "00:"
else
minutesString = ""
end if
else
minutesString = Format(minutes, "00\:")
end if

return hoursString + minutesString + Format(seconds, "00")
End Function

```

Notes: (from the rb mailinglist)

5.0.2 Do you have plugins for Android?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Since there is no plugin SDK for Android, we have no way to make a plugin for Android.

Notes: We support macOS, Windows, Linux and iOS.

5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use functions from NSColor to get proper highlight color in RGB:

Example:

```

Function ProperHighlightColor(active as Boolean) As Color
#if TargetCocoa
Dim theColor As NSColorMBS
If active Then
theColor = NSColorMBS.alternateSelectedControlColor
Else
theColor = NSColorMBS.secondarySelectedControlColor
End If

```

```

Dim rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibrate-

```

```

dRGBColorSpace)
If rgbColor <>Nil Then
Dim red as Integer = rgbColor.redComponent * 255.0
Dim green as Integer = rgbColor.greenComponent * 255.0
Dim blue as Integer = rgbColor.blueComponent * 255.0
Return RGB(red, green, blue)
Else
Return HighlightColor
End If
#else
return HighlightColor
#endif
End Function

```

Notes: As you see we convert color to Calibrated RGB for best results.
See also:

- 5.0.4 How to catch delete key? 157
- 5.0.5 How to convert cmyk to rgb? 158
- 5.0.6 How to delete a folder? 159
- 5.0.7 How to detect if CPU is 64bit processor? 160
- 5.0.8 How to query variant type string for a variant? 161
- 5.0.9 How to refresh a htmlviewer on Windows? 162

5.0.4 How to catch delete key?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code in keydown event catches delete or backspace keys.

Example:

```

Function KeyDown(Key As String) As Boolean
if asc(key) = 8 or asc(key) = 127 then
MsgBox "Delete"
Return true
end if
End Function

```

See also:

- 5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156

- 5.0.5 How to convert cmyk to rgb? 158
- 5.0.6 How to delete a folder? 159
- 5.0.7 How to detect if CPU is 64bit processor? 160
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- 5.0.9 How to refresh a htmlviewer on Windows? 162

5.0.5 How to convert cmyk to rgb?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

The following is the code to convert cmyk values to an RGB color datatype.

It's just a basic estimate of the color values. If you are looking for completely color accurate solution, this is not it. It should work for most people. :)

Example:

Function CMYKToRGB(c as Integer, m as Integer, y as Integer, k as Integer) As color

// converts c,m,y,k values (0-100) to color data type RGB

// place this in a method. Supply C,M,Y,K values-

// it returns color datatype

```
dim color_RGB as color
```

```
dim r, g, b as Integer
```

```
r=255-round(2.55*(c+k))
```

```
if r<0 then
```

```
  r=0
```

```
end if
```

```
g=255-round(2.55*(m+k))
```

```
if g<0 then
```

```
  g=0
```

```
end if
```

```
b=255-round(2.55*(y+k))
```

```
if b<0 then
```

```
  b=0
```

```
end if
```

```
color_RGB=RGB(r,g,b)
```

```
return color_RGB
```

```
End Function
```

Notes:

(from the rb mailinglist)
See also:

- 5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 5.0.4 How to catch delete key? 157
- 5.0.6 How to delete a folder? 159
- 5.0.7 How to detect if CPU is 64bit processor? 160
- 5.0.8 How to query variant type string for a variant? 161
- 5.0.9 How to refresh a htmlviewer on Windows? 162

5.0.6 How to delete a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code that deletes a folder recursively.

Example:

```
Sub deletefolder(f as folderitem)
dim files(-1) as FolderItem

if f=nil then Return

// delete single file
if f.Directory=false then
f.Delete
Return
end if

// get a list of all items in that folder
dim i,c as Integer
c=F.Count
for i=1 to c
files.Append f.TrueItem(i)
next

// delete each item
for each fo as FolderItem in files
if fo=nil then
' ignore
elseif fo.Directory then
deletefolder fo
fo.delete
else ' file
```

```
fo.Delete
end if
next
```

```
f.Delete
End Sub
```

See also:

- 5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 5.0.4 How to catch delete key? 157
- 5.0.5 How to convert cmyk to rgb? 158
- 5.0.7 How to detect if CPU is 64bit processor? 160
- 5.0.8 How to query variant type string for a variant? 161
- 5.0.9 How to refresh a htmlviewer on Windows? 162

5.0.7 How to detect if CPU is 64bit processor?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Via CPUID you can ask CPU:

Example:

```
dim c as new CPUIDMBS

if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox "64-bit CPU"
else
MsgBox "32-bit CPU"
end if
```

Notes: Should work on all intel compatible CPUs.

See also:

- 5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 5.0.4 How to catch delete key? 157
- 5.0.5 How to convert cmyk to rgb? 158
- 5.0.6 How to delete a folder? 159
- 5.0.8 How to query variant type string for a variant? 161
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5.0.8 How to query variant type string for a variant?

Plugin Version: 20.5, Platforms: macOS, Linux, Windows.

Answer: The following example function returns type string for variant.

Example:

```
Public Function VariantTypeString(v as Variant) as string
// Xojo's VarType doesn't know Unsigned integers
'Dim type As Integer = VarType(v)

// MBS VarType can detect unsigned integer
Dim type As Integer = GetVariantTypeMBS(v)

Dim IsArray As Boolean = BitwiseAnd(type, Variant.TypeArray) = Variant.TypeArray

// type without array
type = BitwiseAnd(type, Bitwise.OnesComplement(Variant.TypeArray))

// build a dictionary to map types on first call
Static TypeMap As Dictionary
If TypeMap = Nil Then
TypeMap = New Dictionary
TypeMap.Value(Variant.TypeBoolean) = "Boolean"
TypeMap.Value(Variant.TypeCFStringRef) = "CFStringRef"
TypeMap.Value(Variant.TypeColor) = "Color"
TypeMap.Value(Variant.TypeCString) = "CString"
TypeMap.Value(Variant.TypeCurrency) = "Currency"
TypeMap.Value(Variant.TypeDate) = "Date"
TypeMap.Value(Variant.TypeDateTime) = "DateTime"
TypeMap.Value(Variant.TypeDouble) = "Double"
TypeMap.Value(Variant.TypeInt32) = "Int32"
TypeMap.Value(Variant.TypeInt64) = "Int64"
TypeMap.Value(Variant.TypeInteger) = "Integer"
TypeMap.Value(Variant.TypeNil) = "Nil"
TypeMap.Value(Variant.TypeObject) = "Object"
TypeMap.Value(Variant.TypeOSType) = "OSType"
TypeMap.Value(Variant.TypePString) = "PString"
TypeMap.Value(Variant.TypePtr) = "Ptr"
TypeMap.Value(Variant.TypeSingle) = "Single"
TypeMap.Value(Variant.TypeString) = "String"
TypeMap.Value(Variant.TypeStructure) = "Structure"
TypeMap.Value(Variant.TypeText) = "Text"
TypeMap.Value(Variant.TypeWindowPtr) = "WindowPtr"
TypeMap.Value(Variant.TypeWString) = "WString"

// MBS extra types
TypeMap.Value(Variant.TypeInt32+100) = "UInt32"
TypeMap.Value(Variant.TypeInt64+100) = "UInt64"
```

End If

```
// lookup type

#if DebugBuild then
If Not TypeMap.HasKey(type) Then
Break // missing type
End If
#endif

If IsArray Then
Return "Array of " + TypeMap.Lookup(type,"?")
Else
Return TypeMap.Lookup(type,"?")
End If
End Function
```

See also:

- 5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 5.0.4 How to catch delete key? 157
- 5.0.5 How to convert cmyk to rgb? 158
- 5.0.6 How to delete a folder? 159
- 5.0.7 How to detect if CPU is 64bit processor? 160
- 5.0.9 How to refresh a htmlviewer on Windows? 162

5.0.9 How to refresh a htmlviewer on Windows?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can ask the browser to reload the website with this code line:

Example:

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:

- 5.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 5.0.4 How to catch delete key? 157
- 5.0.5 How to convert cmyk to rgb? 158

- 5.0.6 How to delete a folder? 163
- 5.0.7 How to detect if CPU is 64bit processor? 159
- 5.0.8 How to query variant type string for a variant? 160

5.0.10 Is there an example for vector graphics in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this example inside the paint event of a window:

Example:

```
dim v as Group2D
dim r as RectShape
dim s as StringShape
```

```
const pi=3.14
```

```
s=new StringShape
s.Text="Hello World!"
s.TextFont="Geneva"
s.TextSize=24
s.FillColor=rgb(0,0,255)
s.Italic=true
s.y=5
s.x=0
```

```
r=new RectShape
```

```
r.X=0
r.y=0
r.Height=100
r.Width=180
r.BorderColor=rgb(255,0,0)
r.FillColor=rgb(0,255,0)
r.BorderWidth=5
r.Border=50
```

```
v=new Group2d
v.Append r
v.Append s
v.Rotation=pi*-20.0/180.0
v.x=150
v.y=150
```

```
g.DrawObject v
```

5.0.11 Picture functions do not preserve resolution values?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the picture functions return pictures with no/default resolution values.

Example:

```
dim l as Picture = LogoMBS(500)
```

```
l.HorizontalResolution = 300
```

```
l.VerticalResolution = 300
```

```
dim r as Picture = l.Rotate90MBS
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

```
r.HorizontalResolution = l.HorizontalResolution
```

```
r.VerticalResolution = l.VerticalResolution
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

Notes: So please fix them yourself after calling a function.

Maybe in the future this changes, but currently you can't really set this easily from plugin code.

5.0.12 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Fill a memoryblock like this:

Example:

```
Dim MB As Memoryblock
```

```
MB = NewMemoryBlock(8)
```

```
MB.Short(0) = window1.Top
```

```
MB.Short(2) = window1.Left
```

```
MB.Short(4) = window1.Height+window1.Top // bottom
```

```
MB.Short(6) = window1.Width+window1.Left // right
```

5.0.13 API client not supported?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you get this exception message on `SQLConnectionMBS.Connect`, we may have a problem.

Notes: First case is that the given thing is not supported (e.g. MS SQL directly on Mac).

Second case is that the plugin compilation went wrong and the support for the database was not linked into the plugin. Like MySQL missing or MS SQL on Windows missing. In that case please contact us to fix the plugin.

5.0.14 Can I access Access Database with Java classes?

Plugin Version: all, Platform: Windows.

Answer: You can use `ucanaccess` to access databases created with Microsoft

Example:

```

dim options(-1) as string

// load all the jar files we have in a folder called java:

dim appFolder as FolderItem = GetFolderItem("")

Dim count as Integer = appFolder.Parent.Child("java").Count
dim libjs() as string
For i as Integer = 1 to count
Dim f As FolderItem = appFolder.Parent.Child("java").item(i)
If f <> Nil and f.Exists Then
libjs.append f.NativePath+";"
End If
Next

// now init virtual machine
dim library as string = Join(libjs, "")
dim vm as new JavaVMMBS(library)

if vm.Handle = 0 then
MsgBox "Failed to initialize virtual machine"
else
// now make a new database connection with ucanaccess
dim d as new JavaDatabaseMBS(vm,"net.ucanaccess.jdbc.UcanaccessDriver")
Dim DbFile as FolderItem = appFolder.Parent.Child("Database11.accdb")
dim j as JavaConnectionMBS = d.getConnection("jdbc:ucanaccess://" + DbFile.NativePath)

// select and show values
dim r as JavaResultSetMBS = j.MySelectSQL("Select * From test")
while r.NextRecord
MsgBox r.getString("FirstName") + " " + r.getString("LastName")
wend

end if

```

Exception e as JavaExceptionMBS
 MsgBox e.message+" **errorcode:** "+str(e.ErrorNumber)

Notes: see website:
<http://ucanaccess.sourceforge.net/site.html>

5.0.15 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, we have a graphics class integration for DynaPDF.

Notes: Since MBS Plugin in version 19.2, we can integrate reports with Xojo.

5.0.16 Can I use AppleScripts in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Example:

```
dim a as new AppleScriptMBS

// query my application name
a.Compile "tell application ""System Events"" to return name of current application"

// run
a.Execute

// show result
label1.text = a.Result

// shows something like "My Application.fcgi.debug"
```

Notes: This can be useful to control the server from remote, if and only if the your sever is running Mac OS X.

5.0.17 Can I use graphics class with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sorry, no. We can't provide a graphics subclass from plugin.

Notes: This is a feature request to allow graphics subclasses:
Feedback case 11391: [feedback://showreport?report_id=11391](https://feedback.apple.com/feedback/showreport?report_id=11391)

5.0.18 Can I use sockets on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Notes: You can use `HTTPSocket`, `SMTPSocket`, `POP3Socket`, `SMTPSecureSocket`, `SecurePOP3Socket`, `EasyTCPSocket`, `EasyUDPSocket`, `AutoDiscovery`, our Bonjour classes or our `CURL*` classes. But all of them work on the server, not on the client.

This means if you search for a printer with Bonjour, you can find the printers in the local network on your server hosting site. Using `SMTPSocket` may be a good idea for sending emails from the server like notifications.

5.0.19 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.

Example:

```
// The data for the pie chart
dim data(-1) as Double=array(55.0, 18.0, 25.0, 22.0, 18.0, 30.0, 35.0)

// The labels for the pie chart, Words are chosen random to check font!
dim labels(-1) as string=array("Germany", "Italy", "France", "Spain", "UK", "Poland", "Russia")

// The colors to use for the sectors
dim colors(-1) as Integer

colors.Append &h66aaee
colors.Append &heebb22
colors.Append &hbbsbbb
colors.Append &h8844ff

if TargetLinux then
  CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype/msttcorefonts"
end if

// Create a PieChart object of size 360 x 300 pixels
dim c as new CDPieChartMBS(700, 600)
```

```

c.setBackground(c.linearGradientColor(0, 0, 0, c.getHeight(), &h0000cc, &h000044))
c.setRoundedFrame(&hffffff, 16)
dim tt as CDTextBoxMBS = c.addTitle("ChartDirector Demonstration", "timesbi.ttf", 18)
tt.setMargin(0, 0, 16, 0)
tt.setFontColor(&hFFFFFF)

// Set the center of the pie at (180, 140) and the radius to 100 pixels
c.setPieSize 350,300,150
// Set the sector colors
c.setColors(c.kDataColor, colors)

// Draw the pie in 3D with a pie thickness of 20 pixels
c.set3D(20)

dim t as CDTextBoxMBS = c.setLabelStyle("arialbd.ttf", 10, &h000000)
t.setBackground(CDPieChartMBS.kSameAsMainColor, CDPieChartMBS.kTransparent, CDPieChartMBS.soft-
Lighting(CDPieChartMBS.kRight, 0))
t.setRoundedCorners(8)

// Use local gradient shading for the sectors, with 5 pixels wide
// semi-transparent white (bbffffff) borders
c.setSectorStyle(CDPieChartMBS.kLocalGradientShading, &hbbffffff, 0)

// Set the pie data and the pie labels
c.setData data,labels
call c.setLabelStyle "arialbd.ttf",18

dim pic as picture = c.makeChartPicture
dim wp as new WebPicture(pic, Picture.FormatJPEG) // JPEG makes it smaller and faster

ImageView1.Picture=wp

```

Notes: Be aware that our plugin produces pictures for you, which you assign to ImageViews. Transferring those pictures takes time, so you can optimize that with using WebPicture class. There you can decide between different compressions to improve speed (use JPEG instead of PNG).

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

5.0.20 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our DynaPDF plugin works just fine on the Xojo Web Edition.

Notes: PDF files are created on the server. You may want to offer a preview to the user which uses reduced resolution images to reduce the time to download the PDF.

See our Create PDF example for the Xojo Web Edition.

5.0.21 Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: No.

5.0.22 Can you get an unique machine ID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There is nothing like an unique machine ID.

Notes: 1:

You can use the MAC IDs of the network interfaces.

This can be changed by the user with software tools.

And the list of network interfaces changes if user reorder the interfaces.

2:

You can use the system folder creation date/time.

This may stay equal after cloning machines or after migration to new PC.

3:

You can use the Mac Serialnumber.

Mac only and it can happen that a Mac does not have a serial number.

4:

You can use the x86 CPU ID.

This is x86 CPU only and does not avoid running on the same CPU in different PCs.

5.0.23 ChartDirector: Alignment Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Alignment Specification

Notes: In many ChartDirector objects, you may specify the alignment of the object's content relative to its boundary. For example, for a TextBox object, you may specify the text's alignment relative to the box boundary by using `TextBox.setAlignment`.

The ChartDirector API defines several constants for the alignment options.

ConstantValueDescription

BottomLeft	1	The leftmost point on the bottom line.
BottomCenter	2	The center point on the bottom line.
BottomRight	3	The rightmost point on the bottom line.
Left	4	The leftmost point on the middle horizontal line.
Center	5	The center point on the middle horizontal line.
Right	6	The rightmost point on the middle horizontal line.
TopLeft	7	The leftmost point on the top line.
TopCenter	8	The center point on the top line.
TopRight	9	The rightmost point on the top line.
Bottom	2	The center point on the bottom line. Same as BottomCenter.
Top	8	The center point on the top line. Same as TopCenter.
TopLeft2	10	An alternative top-left position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, TopLeft2 refers to refers to the left of the top side, while TopLeft refers to the top of the left side. The reverse applies for a horizontal axis.
TopRight2	11	An alternative top-right position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, TopRight2 refers to refers to the right of the top side, while TopRight refers to the top of the right side. The reverse applies for a horizontal axis.
BottomLeft2	12	An alternative bottom-left position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, BottomLeft2 refers to refers to the left of the bottom side, while BottomLeft refers to the bottom of the left side. The reverse applies for a horizontal axis.
BottomRight2	13	An alternative bottom-right position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, BottomRight2 refers to refers to the right of the bottom side, while BottomRight refers to the bottom of the right side. The reverse applies for a horizontal axis.

5.0.24 ChartDirector: Color Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Color Specification

Notes: Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports col-

ors specified in web and HTML compatible ARGB format, in which ARGB refers to the Alpha transparency, Red, Green and Blue components of the color.

In addition to ARGB colors, ChartDirector supports "dynamic" colors. A dynamic color is a color that changes depending on the position of the pixels. The "dynamic" colors that ChartDirector supports include "pattern colors", "metal colors", "gradient colors", "zone colors" and "dash line colors".

ChartDirector supports specifying colors indirectly using "palette colors". When a "palette color" is used, the color is specified as an index to a palette. The actual color is looked up from the palette. ARGB Color ARGB color consists of 4 components - alpha transparency, red, green and blue. The four components are encoded as a 32-bit number, with each component occupying 8 bits. In hexadecimal notation, it is AAR-RGGBB, where AA, RR, GG and BB are the alpha transparency, red, green and blue components.

Each component ranges from 00 - FF (0 - 255), representing its intensity. For example, pure red color is 00FF0000, pure green color is 0000FF00, and pure blue color is 000000FF. White color is 00FFFFFF, and black color is 00000000.

Most programming language requires you to put special prefix in front of hexadecimal characters. For C++, the prefix is "0x". For example, the syntax for the hexadecimal number 00FFFFFF is 0x00FFFFFF, or simply 0xFFFFFF.

For the alpha transparency component, a zero value means the color is not transparent at all. This is equivalent to traditional RGB colors. A non-zero alpha transparency means the color is partially transparent. The larger the alpha transparency, the more transparent the color will be. If a partially transparent color is used to draw something, the underlying background can still be seen.

For example, 80FF0000 is a partially transparent red color, while 00FF0000 is a non-transparent red color.

Note that ChartDirector's ARGB color is web and HTML compatible. For example, red is FF0000, the same as in HTML. There are many resources on the web that provide tables in which you can click a color and it will show its HTML color code. These color codes can be used in ChartDirector.

If alpha transparency is FF (255), the color is totally transparent. That means the color is invisible. It does not matter what the RGB components are. So in ChartDirector, only one totally transparent color is used - FF000000. All other colors of the form FFnnnnnn are reserved to represent palette colors and dynamic colors, and should not be interpreted as the normal ARGB colors.

The totally transparent color FF000000 is often used in ChartDirector to disable drawing something. For example, if you want to disable drawing the border of a rectangle, you can set the border color to totally transparent.

For convenience, ChartDirector defines a constant called Transparent, which is equivalent to FF000000. Pattern Color

A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

Pattern colors are created using `BaseChart.patternColor`, `BaseChart.patternColor2`, `DrawArea.patternColor` and `DrawArea.patternColor2`. The `patternColor` method creates pattern colors using an array of colors as a bitmap. The `patternColor2` method creates pattern colors by loading the patterns from image files.

These methods return a 32-bit integer acting as a handle to the pattern color. The handle can be used in any `ChartDirector` API that expects a color as its input.

A metal color is a color of which the brightness varies smoothly across the chart surface as to make the surface look shiny and metallic. `ChartDirector` supports using any color as the base color of the metal color. In particular, using yellow and grey as the base colors will result in metal colors that look gold and silver.

Metal colors are most often used as background colors of charts. They are created using `CDBaseChartMBS.metalColor`, `CDBaseChartMBS.goldColor` and `CDBaseChartMBS.silverColor`. The first method allows you to specify an arbitrary base color. The second and third methods use yellow and grey as the base colors, resulting in gold and silver metal colors.

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any `ChartDirector` API that expects a color as its input.

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.

A dash line color is a color that switches on and off periodically. When used to draw a line, the line will appear as a dash line.

Dash line colors are created using `BaseChart.dashLineColor` and `DrawArea.dashLineColor`. They accept a line color and a dash pattern code as arguments, and return a 32-bit integer acting as a handle to the dash line color. The handle can be used in any `ChartDirector` API that expects a color as its input.

Zone Colors
A zone color is for XY charts only. It is a color that automatically changes upon reaching a data threshold value along the x-axis or y-axis. Zone colors are created using `Layer.xZoneColor`, `Layer.yZoneColor`, `XYChart.xZoneColor` or `XYChart.yZoneColor`.

Palette Colors
Palette colors are colors of the format `FFFFnnnn`, where the least significant 16 bits (`nnnn`) are the index to the palette. A palette is simply an array of colors. For a palette color, the actual color is obtained by

looking up the palette using the index. For example, the color FFFF0001 is the second color in the palette (first color is index 0).

The colors in the palette can be ARGB colors or "dynamic" colors (pattern, gradient and dash line colors).

The first eight palette colors have special significance. The first three palette colors are the background color, default line color, and default text color of the chart. The 4th to 7th palette colors are reserved for future use. The 8th color is a special dynamic color that is equal to the data color of the "current data set".

The 9th color (index = 8) onwards are used for automatic data colors. For example, in a pie chart, if the sector colors are not specified, ChartDirector will automatically use the 9th color for the first sector, the 10th color for the second sector, and so on. Similarly, for a multi-line chart, if the line colors are not specified, ChartDirector will use the 9th color for the first line, the 10th color for the second line, and so on.

The ChartDirector API defines several constants to facilitate using palette colors.

ConstantValueDescription

Palette	FFFF0000	The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1).
BackgroundColor	FFFF0000	The background color.
LineColor	FFFF0001	The default line color.
TextColor	FFFF0002	The default text color.
[Reserved]	FFFF0003 - FFFF0006	These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance.
SameAsMainColor	FFFF0007	A dynamic color that is equal to the data color of the current data set. This color is useful for objects that are associated with data sets. For example, in a pie chart, if the sector label background color is SameAsMainColor, its color will be the same as the corresponding sector color.
DataColor	FFFF0008	The starting point for the automatic data color allocation.

When a chart is created, it has a default palette. You may modify the palette using BaseChart.setColor, BaseChart.setColors, or BaseChart.setColors2.

The advantages of using palette colors are that you can change the color schemes of the chart in one place. ChartDirector comes with several built-in palettes represented by the following predefined constants.

ConstantDescription

5.0.25 ChartDirector: Font Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

defaultPalette	An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds).
whiteOnBlackPalette	An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds).
transparentPalette	An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent.

Answer: ChartDirector: Font Specification

Notes: Font Name

In ChartDirector, the font name is simply the file name that contains the font. For example, under the Windows platform, the "Arial" font is "arial.ttf", while the "Arial Bold" font is "arialbd.ttf".

NOTE: Mac OS X Specific Information

In Mac OS X, in addition to ".ttf", ChartDirector also supports Mac OS X font file formats, such as Font Suitcase files and Datafork files (.dfont). These files often contain multiple fonts. For example, the "GillSans.dfont" file contains 6 fonts.

So in addition to the file name, an index is needed to determine the font. The index is specified by appending a " | " character to the font name, followed by the index number. For example, the third font in "GillSans.dfont" is denoted as "GillSans.dfont | 2". (Note: The first font starts at 0.) If no index number is provided, the first font is assumed.

ChartDirector also supports using Mac OS X Font Manager names. For example, one may use "Gill Sans Light Italic" instead of using "GillSans.dfont | 1" as the font name. However, the Mac OS X Font Manager is active only if someone has logged into the Mac GUI console, so this method is only recommended for developing applications that run on the GUI console.

The sample programs that come with ChartDirector are designed to run on all operating systems, so they use generic font file names (eg. "arial.ttf") instead of Mac OS X specific names. To allow them to run on Mac OS X, ChartDirector on Mac OS X has a built-in table to map common font file names to Mac OS X font names:

"arial.ttf", "arialbd.ttf", "ariali.ttf" and "arialbi.ttf" are mapped to "Arial | 0" (Arial), "Arial | 1" (Arial Bold), "Arial | 2" (Arial Italic) and "Arial | 3" (Arial Bold Italic)

"times.ttf", "timesbd.ttf", "timesi.ttf" and "timesbi.ttf" are mapped to "Times New Roman | 0" (Times New Roman), "Times New Roman | 1" (Times New Roman Bold), "Times New Roman | 2" (Times New Roman Italic) and "Times New Roman | 3" (Times New Roman Bold Italic)

"cour.ttf", "courbd.ttf", "couri.ttf" and "courbi.ttf" are mapped to "Courier New | 0" (Courier New), "Courier New | 1" (Courier New Bold), "Courier New | 2" (Courier New Italic) and "Courier New | 3" (Courier New Bold Italic)

Font Location

ChartDirector on Windows does not come with any font files. It relies on the operating system's font files in the " [windows] \Fonts" directory. To see what fonts are installed in your operating system and their file names, use the File Explorer to view that directory.

ChartDirector on Windows will also search for the font files in the "fonts" subdirectory (if it exists) under the directory where the ChartDirector DLL "chartdir.dll" is installed. This is useful for private fonts. Also, for some especially secure web servers, the web anonymous user may not have access to the " [windows] \Fonts" directory. In this case, you may copy the font files to the above subdirectory.

ChartDirector on Mac OS X relies on operating system font files in "/Library/Fonts" and "/System/Library/Fonts".

ChartDirector on Linux, FreeBSD and Solaris assume the fonts files are in the "fonts" subdirectory under the directory where the ChartDirector shared object "libchartdir.so" is installed. ChartDirector on Linux, FreeBSD and Solaris come with a number of font files in the "fonts" subdirectory.

To keep the download size small, ChartDirector on Linux, FreeBSD and Solaris only come with some commonly used fonts. You may download additional fonts from the Internet. In particular, the Microsoft fonts at

http://sourceforge.net/project/showfiles.php?group_id=34153&release_id=105355

is highly recommended. Please refer to

<http://www.microsoft.com/typography/faq/faq8.htm>

on how you could use the fonts legally in your system.

ChartDirector supports True Type fonts (.ttf), Type 1 fonts (.pfa and .pfb) and Windows bitmap fonts (.fon). On Mac OS X, ChartDirector also supports Font Suitcase and Datafork (.dfont) files. On Linux, FreeBSD and Solaris, ChartDirector also supports Portable Compiled Fonts (.pcf fonts).

If you want ChartDirector to search other directories for the font files, you may list the directories in an environment variable called "FONTSPATH".

If you specify an absolute path name for the font file, ChartDirector will use the absolute path name and will not search other directories.

Artificial Boldening and Italicizing
Whereas most popular font comes with different styles for "normal", "bold", "italic" and "bold italic", some fonts only come with one style (the normal style). For example, the Monotype Corsiva font that comes with MS Office only has the normal style (mtcorsva.ttf). For these cases, you may append the "Bold" and/or "Italic" words after the font file name (separated with a space) to ask ChartDirector to artificially bolden and/or italicize the font. For example, you may specify the font name as "mtcorsva.ttf Bold".

Font List
Instead of specifying a single font file as the font name, you may specify a list of font files as the font name, separated by semi-colons. This is useful when using international characters that are only available in some fonts.

For example, if you would like to use the Arial font ("arial.ttf") for western characters, and the MingLiu font "mingliu.ttc" for Chinese characters (since the Arial font does not have Chinese characters), you may specify the font name as "arial.ttf;mingliu.ttc". In this case, ChartDirector will try the Arial font first. If it cannot find a certain character there, it will try the MingLiu font.

ChartDirector supports several special keywords for specifying the font name indirectly. When these keywords are used as font names, ChartDirector will look up the actual font names from a font table. The keywords are as follows:

KeywordsDescription

"normal"	This default normal font, which is the first font in the font table. This is initially mapped to "arial.ttf" (Arial).
"bold"	The default bold font, which is the second font in the font table. This is initially mapped to "arialbd.ttf" (Arial Bold).
"italic"	The default italic font, which is the third font in the font table. This is initially mapped to "ariali.ttf" (Arial Italic).
"boldItalic"	The default bold-italic font, which is the fourth font in the font table. This is initially mapped to "arialbi.ttf" (Arial Bold Italic).
"fontN"	The (N + 1)th font in the font table (the first font is "font0").

The font table can be modified using `BaseChart.setFontTable` or `DrawArea.setFontTable`.

The advantage of using indirect font names is that you can change the fonts in your charts in one place.

Most font files contain one font. However, it is possible a font file contains multiple fonts (that is, a font collection). For example, in True Type fonts, font files with extension ".ttc" may represent a font collection.

If a font file contains multiple font, the font index can be used to specify which font to use. By default, the font index is 0, which means the first font in the font file will be used.

The font size decides how big a font will appear in the image. The font size is expressed in a font unit called points. This is the same unit used in common word processors.

Instead of specifying font size, some ChartDirector API (eg. `TextBox.setFontSize`) allow you to specify font height and font width separately. You may use different point sizes for font height and font width to create special effects.

This is the color to draw the font. (See Color Specification on how colors are represented in ChartDirector.)

This is the angle in degrees by which the font should be rotated anti-clockwise.

By default, text are laid out horizontally, with characters being drawn from left to right.

ChartDirector also supports vertical layout, with characters being drawn from top to bottom. For example, you may use `BaseChart.addText` to add text that are laid out vertically. Vertical layout is common for

oriental languages such as Chinese, Japanese and Korean.

5.0.26 ChartDirector: Mark Up Language

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Mark Up Language

Notes: ChartDirector Mark Up Language (CDML) is a language for including formatting information in text strings by marking up the text with tags.

CDML allows a single text string to be rendered using multiple fonts, with different colors, and even embed images in the text. **Font Styles**

You can change the style of the text by using CDML tags. For example, the line:

```
<*font=timesi.ttf,size=16,color=FF0000>Hello <*font=arial.ttf,size=12,color=8000*>world!
```

will result in the following text rendered:

In general, all tags in CDML are enclosed by <*> and *>. Attributes within the tags determine the styles of the text following the tags within the same block.

If you want to include <*> in text without being interpreted as CDML tags, use «* as the escape sequence.

The following table describes the supported font style attributes in CDML. See [Font Specification](#) for details on various font attributes.

Attribute	Description
super	Set the following text to be in superscript style. This attribute does not need to have a value. (You may use "super" as the attribute instead of "super=1".)

Note that unlike HTML tags, no double or single quotes are used in the tags. It is because CDML tags are often embedded as string literals in source code. The double or single quotes, if used, will conflict with the string literal quotes in the source code. Therefore in CDML, no quotes are necessary and they must not be used.

Also, unlike HTML tags, CDML uses the comma character as the delimiter between attributes. It is because certain attributes may contain embed spaces (such as the font file name). So space is not used as the delimiter and the comma character is used instead.

Note the font attribute above starts a new style section, while other attributes just modify the current style

font	Starts a new style section, and sets the font name. You may use this attribute without a value (that is, use "font" instead of "font=arial.ttf") to create a new style section without modifying the font name.
size	The font size.
width	The font width. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
height	The font height. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
color	The text color in hex format.
bgColor	The background color of the text in hex format.
underline	The line width of the line used to underline the following characters. Set to 0 to disable underline.
sub	Set the following text to be in subscript style. This attribute does not need to have a value. (You may use "sub" as the attribute instead of "sub=1".)
super	Set the following text to be in superscript style.
xoffset	Draw the following the text by shifting the text horizontally from the original position by the specified offset in pixels.
yoffset	Draw the following the text by shifting the text vertically from the original position by the specified offset in pixels.
advance	Move the cursor forward (to the right) by the number of pixels as specified by the value this attribute.
advanceTo	Move the cursor forward (to the right) to the position as specified by the value this attribute. The position is specified as the number of pixels to the right of the left border of the block. If the cursor has already passed through the specified position, the cursor is not moved.

section. You may use `</font*>` to terminate a style section, which will restore the font styles to the state before the style section.

Blocks and Lines

In CDML, a text string may contain multiple blocks. A block may contain multiple lines of text by separating them with new line characters ("`\n`") or with `<br*>`. The latter is useful for programming languages that cannot represent new line characters easily.

For example, the line:

```
<*size=15*><*block*><*color=FF*>BLOCK<*br*>ONE<*/*>and <*block*><*color=FF00*>BLOCK<*br*>TWO
```

will result in the following text rendered:

The above example contains a line of text. The line contains two blocks with the characters " and " in between. Each block in turn contains two lines. The blocks are defined using `<*block*>` as the start tag and

`<*/*>` as the end tag.

When a block ends, font styles will be restored to the state before entering the block. Embedding Images
CDML supports embedding images in text using the following syntax:

```
<*img=my_image_file.png*>
where my_image_file.png is the path name of the image file.
```

For example, the line:

```
<*size=20*>A <*img=sun.png*>day
will result in the following text rendered:
```

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to `BaseChart.setSearchPath` or `DrawArea.setSearchPath` on the directory that ChartDirector will search for the file.

The `<*img*>` tag may optionally contain width and height attributes to specify its pixel width and height. In this case, ChartDirector will stretch or compress the image if necessary to the required width and height. Blocks Attributes

CDML supports nesting blocks, that is, a block can contain other sub-blocks. Attributes are supported in the `<*block*>` tag to control the alignment and orientation of the sub-blocks. The `<*img=my_image_file.png*>` is treated as a block for layout purposes.

For example, the line:

```
<*block,valign=absmiddle*><*img=molecule.png*><*block*>Hydrazino\nMolecule<*/*><*/*>
will result in the following text rendered:
```

The the above starts `<*block,valign=absmiddle*>` which specifies its content should align with each others in the vertical direction using the absolute middle alignment. The block contains an image, followed by a space characters, and then another block which has two lines of text.

The following table describes the supported attributes inside `<*block*>` tag:

Attribute	Description
-----------	-------------

The value `baseline` means the baseline of sub-blocks should align with the baseline of the block. The `baseline`

width	The width of the block in pixels. By default, the width is automatically determined to be the width necessary for the contents of the block. If the width attribute is specified, it will be used as the width of the block. If the width is insufficient for the contents, the contents will be wrapped into multiple lines.
height	The height of the block in pixels. By default, the height is automatically determined to be the height necessary for the contents of the block. If the height attribute is specified, it will be used as the height of the block.
maxwidth	The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines.
truncate	The maximum number of lines of the block. If the content requires more than the maximum number of lines, it will be truncated. In particular, if truncate is 1, the content will be truncated if it exceeds the maximum width (as specified by maxwidth or width) without wrapping. The last few characters at the truncation point will be replaced with "...".
linespacing	The spacing between lines as a ratio to the default line spacing. For example, a line spacing of 2 means the line spacing is two times the default line spacing. The default line spacing is the line spacing as specified in the font used.
bgColor	The background color of the block in hex format.
valign	The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle.

is the underline position of text. This is normal method of aligning text, and is the default in CDML. For images or blocks that are rotated, the baseline is the same as the bottom.

The value top means the top line of sub-blocks should align with the top line of the block.

The value bottom means the bottom line of sub-blocks should align with the bottom line of the block.

The value middle means the middle line of sub-blocks should align with the the middle line of the block. The middle line is the middle position between the top line and the baseline.

The value absmiddle means the absolute middle line of sub-blocks should align with the absolute middle line of the block. The absolute middle line is the middle position between the top line and the bottom line.

halign The horizontal alignment of lines. This is for blocks that contain multiple lines. Supported values are left, center and right.

The value left means the left border of each line should align with the left border of the block. This is the default.

The value center means the horizontal center of each line should align with the horizontal center of the block.

The value right means the right border of each line should align with the right border of the block.

angle Rotate the content of the block by an angle. The angle is specified in degrees in counter-clockwise direction.

5.0.27 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Parameter Substitution and Formatting

Notes: ChartDirector charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, HTML image maps, etc, are all text strings.

ChartDirector uses parameter substitution to allow you to configure precisely the information contained in the text and their format.

Format Strings

In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

```
" { label } ( { percent } %)"
```

When the sector label is actually drawn, ChartDirector will replace " { label } " with the sector name, and " { percent } " with the sector percentage. So the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

```
" { label } : US$ { value | 2 } K ( { percent } %)"
```

The sector label will then become something like "ABC: US\$ 123.00 (34.56%)".

In general, in ChartDirector parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, ChartDirector supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the Number Formatting and Date/Time Formatting sections below for details.

Parameter Expressions

ChartDirector supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

```
"USD { value } (Euro { = { value } *0.9 } )"
```

In the above, " { value } " will be substituted with the actual value of the sector. The expression " { = { value } *0.9 } " will be substituted with the actual value of the sector multiplied by 0.9.

ChartDirector parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

Parameter	Description
sector	The sector number. The first sector is 0, while the nth sector is (n-1).
dataSet	Same as { sector } . See above.
label	The text label of the sector.
dataSetName	Same as { label } . See above.
value	The data value of the sector.
percent	The percentage value of the sector.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using BaseChart.addExtraField or BaseChart.addExtraField2.

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the { dataSetName } parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for Line Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Trend Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Box-Whisker Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for HLOC and CandleStick Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Vector Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameters for All Polar Layers

The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for PolarVector Layers

The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameters for Axis

The following table describes the parameters available for pie charts.

Number Formatting

For parameters that are numbers, ChartDirector supports a number of formatting options in parameter substitution.

For example, if you want a numeric field { value } to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use { value | 2, . } . The number 123456.789 will then be displayed as 123,456.79.

For numbers, the formatting options are specified using the following syntax:

```
{ [ param ] | [ a ] [ b ] [ c ] [ d ] }
```

where:

If this field starts with "E" or "e", followed by a number, it means formatting the value using scientific notation with the specified number of decimal places. If the "E" or "e" is not followed by a number, 3 is assumed.

For example, { value | E4 } will format the value 10.3 to 1.0300E+1, and { value | e4 } will format the same value to 1.0300e+1.

If this field starts with "G" or "g", followed by a number, it means formatting the value using the scientific notation only if the value is large and requires more than the specified number of digits, or the value is less than 0.001. If scientific notation is used, the number following "G" or "g" also specifies the number of significant digits to use. If the "G" or "g" is not followed by a number, 4 is assumed.

For example, consider the format string { value | G4 } . The value 10 will be formatted to 10. The value 100000 will be formatted to 1.000E+5. Similarly, for { value | g4 } , the value 10 will be formatted to 10, while the value 100000 will be formatted to 1.000e+5.

If you skip this argument, ChartDirector will display the exact value using at most 6 decimal places.

You may skip [b] [c] [d] . In this case, the default will be used.

Date/Time Formatting

For parameters that are dates/times, the formatting options can be specified using the following syntax:

```
{ [ param ] | [ datetime_format_string ] }
```

where [datetime_format_string] must start with an english character (A-Z or a-z) that is not "G", "g", "E" or "e", and may contain any characters except ' } '. (If it starts with "G", "g", "E" or "e", it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

For example, a parameter substitution format of { value | mm-dd-yyyy } will display a date as something similar to 09-15-2002. A format of { value | dd/mm/yy hh:nn:ss a } will display a date as something similar to 15/09/02 03:04:05 pm.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format { value | mmm '<*color=dd0000*>'yyyy } will display a date as something like Jan <*color=dd0000*>2005 (the <*color=dd0000*> is a CDML tag to specify red text color). Note that the <*color=dd0000*>tag is copied directly without substitution, even it contains "dd" which normally will be substituted with the day of month.

Escaping URL/HTML/CDML characters

Parameter substitution is often used to create HTML image maps. In HTML, some characters has special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, ChartDirector will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&#nn;" (eg. ">" will become ">"). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - " { escape_url } ", " { noescape_url } ", " { escape_html } ", " { noescape_html } ", " { escape_cdml } " and " { noescape_cdml } ". These fields enable/disable the escape methods used in the template fields that follow them.

5.0.28 ChartDirector: Shape Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Shape Specification

Notes: Several ChartDirector API accept shape specification as arguments. For example, BarLayer.setBarShape and BarLayer.setBarShape2 can be used to specify shapes of bars in bar charts, while DataSet.setDataSymbol, DataSet.setDataSymbol4, PolarLayer.setDataSymbol and PolarLayer.setDataSymbol4 can be used to specify shapes for data symbols.

Note that in addition to shapes, in many cases ChartDirector also accepts images or custom draw objects for data representation. For example, see DataSet.setDataSymbol2, DataSet.setDataSymbol3, PolarLayer.setDataSymbol2 and PolarLayer.setDataSymbol3.

Built-In Shapes

Built-in shapes are specified as integers. The integers can be explicit constants, or can be generated by a `ChartDirector` method for parameterized shapes. For example, a circle is represented by an explicit constant `CircleShape (=7)`. On the other hand, the number representing a polygon depends on the number of sides the polygon has, so it is generated by using the `PolygonShape` method, passing in the number of sides as argument.

The following table illustrates the various `ChartDirector` shapes:

Custom Shapes

In `ChartDirector`, custom shapes are specified as an array of integers `x0, y0, x1, y1, x2, y2 ...` representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 1000 x 1000 units, in which the x-axis is from -500 to 500 going from left to right, and the y-axis is from 0 to 1000 going from bottom to top.

`ChartDirector` will automatically scale the polygon so that 1000 units will become to the pixel size as requested by the various `ChartDirector` API.

As an example, the shape of the standard diamond shape in `ChartDirector` is represented as an array with 8 numbers:

```
0, 0, 500, 500, 0, 1000, -500, 500
```

5.0.29 Copy styled text?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to quickly copy styled text from one textarea to another?

Example:

```
#if TargetWin32 then
TextArea1.WinRTFDataMBS = TextArea2.WinRTFDataMBS
#elseif TargetMacOS then
TextArea1.NSTextViewMBS.textStorage.setAttributedString TextArea2.NSTextViewMBS.textStorage
#else
TextArea1.StyledText = TextArea2.StyledText
#endif
```

Notes: The code above uses special plugin functions on Mac and Windows and falls back to framework for Linux.

5.0.30 Do you have code to validate a credit card number?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can check the checksum to tell if a credit card number is not valid.

Example:

```
Dim strNumber As String
Dim nLength as Integer
Dim nValue as Integer
Dim nChecksum as Integer
Dim nIndex as Integer

strNumber = EditField1.Text
nLength = Len(strNumber)
nChecksum = 0

For nIndex = 0 To nLength - 2
    nValue = Val(Mid(strNumber, nLength - (nIndex + 1), 1)) * (2 - (nIndex Mod 2))
    If nValue < 10 Then
        nChecksum = nChecksum + nValue
    Else
        nChecksum = nChecksum + (nValue - 9)
    End If
Next

If Val(Mid(strNumber, Len(strNumber), 1)) = (10 - (nChecksum Mod 10)) Mod 10 Then
    MsgBox("The credit card number looks valid")
Else
    MsgBox("The credit card number is invalid")
End IF
```

Notes: Here's some code that will validate the checksum for a credit card. It works for Visa, MasterCard, American Express and Discover. Not sure about others, but I imagine they use the same basic algorithm. Of course, this doesn't actually mean that the credit card is valid, it's only useful for helping the user catch typos.

The above code doesn't have any error checking and it expects that the credit card number will be entered without spaces, dashes or any other non-numeric characters. Addressing those issues will be an exercise left to the reader. :)

(From Mike Stefanik)

5.0.31 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all.

Answer: Our EyeOne plugin is available on request for licensees of the X-Rite SDKs.

Notes: Please first go to X-Rite and get a SDK license.

Then we can talk about the plugin.

5.0.32 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the plugin can work with multiple recordsets.

Notes: You need to use SQLCommandMBS class. When you get back results, you use FetchNext to walk over all records in the first result set. Then you simply start again with FetchNext to get the second record set.

Even the RecordSet functions should work, just use them twice to get all records from both record sets.

5.0.33 Does the plugin home home?

Plugin Version: all, Platform: macOS.

Answer: Yes, we like to know who is using the plugin, so the plugin may contact our server.

Example:

none.

Notes: Please note that this does not affect your users as the plugin will only do this in the IDE and the relevant plugin part is never included in your applications.

The plugin if used for some hours, does contact our server to provide statistical data about Xojo version and OS versions. This way we know what versions are used. We can return the version number of the current plugin which may be visible in future versions somehow. And we transmit partial licenses data so we can track use of illegal license keys.

If you do not like to have this, you can block Xojo IDE from contacting our website via your Firewall.

Blocking the transfer will not disable the plugin or change the features.

Or contact us for a plugin version which explicitly does not contain this feature.

5.0.34 folderitem.absolutePath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Paths on a Mac are not unique, so use them only to display them to the user.

Example:

```
Function AbsolutePath(f as FolderItem) As String
Dim s as string
Dim nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + "." + s
nf = nf.parent
wend
Return s
End Function
```

5.0.35 Has anyone played round with using CoreImage to do things like add dissolve transitions say when changing from one tab to another within a window?

Platform: macOS.

Answer: This code implements animations for a tabpanel change:

Example:

// in a tabpanel.change event:

```
dim r as CGSTransitionRequestMBS
dim co as new CGSConnectionMBS
dim cw as CGSWindowMBS
dim ct as CGSTransitionMBS
static OldTab as Integer

cw=co.CGSWindow(window1)
If cw = Nil Then
return // 10.3...
End If
r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
```

```

// watch the value of the clicked tab versus the last tab
if tabpanel1.Value=0 or tabpanel1.Value <OldTab then
r.TransitionOption=r.CGSLeft
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
else
r.TransitionOption=r.CGSRight
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
end if
// Keep track of the last tab clicked
OldTab = tabpanel1.Value

```

Notes: See CGS* classes for more details.

5.0.36 How about Plugin support for older OS X?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We support in general Mac OS X 10.5 and newer.

Notes: All the 64-bit plugins on Mac require OS X 10.7.

Intel 32-bit plugins on Mac require OS X 10.5 or newer.

Currently the ChartDirector 6, GraphicsMagick and GameKit plugins requires Mac OS X 10.6. Also for SQL Plugin the built in SQLite library requires 10.6.

5.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all.

Answer: Look on the CPU family returned by sysctl:

Example:

Function is64bit() As Boolean

```
#if TargetLittleEndian
```

```
dim m as MemoryBlock = NewMemoryBlock(8)
```

```
dim family as Integer
```

```
dim s as string
```

```
m=SystemControlNameToMIBMBS("hw.cpufamily")
```

```
m=SystemControlMBS(m)
```

```
if m<>nil then
```

```
m.LittleEndian=True
```

```
family=m.Long(0)
```

```
const CPUFAMILY_INTEL_6_14 = &h73d67300 /* "Intel Core Solo" and "Intel Core Duo" (32-bit Pentium-M with SSE3) */
```

```
const CPUFAMILY_INTEL_6_15 = &h426f69ef /* "Intel Core 2 Duo" */
```

```
const CPUFAMILY_INTEL_6_23 = &h78ea4fbc /* Penryn */
```

```
const CPUFAMILY_INTEL_6_26 = &h6b5a4cd2 /* Nehalem */
```

```
Select case family
```

```
case CPUFAMILY_INTEL_6_14
```

```
Return false
```

```
case CPUFAMILY_INTEL_6_15
```

```
Return true
```

```
case CPUFAMILY_INTEL_6_23
```

```
Return true
```

```
case CPUFAMILY_INTEL_6_26
```

```
Return true
```

```
// newer CPUs may be missing here
```

```
end Select
```

```
end if
```

```
#endif
```

```
Return false
```

```
Exception
```

```
Return false
```

```
End Function
```

Notes: This code is written for Mac OS X where you only have a limited number of possible CPUs.

5.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Platform: Windows.

Answer: The following code will remove the close item from the system menu of the window.

Example:

```
#if TargetWin32 then
Declare Function GetSystemMenu Lib "user32" (hwnd as Integer, bRevert as Integer) as Integer
Declare Function RemoveMenu Lib "user32" (hMenu as Integer, nPosition as Integer, wFlags as Integer) as Integer
Dim hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, &HF060, &H0
#endif
```

Notes: The window may not be updated directly.

5.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
dim m as memoryBlock
dim n as Integer

m=GetEnvironmentStrings()

n=0
do
msgBox m.cstring(n)
while m.byte(n)<>0
n=n+1
wend
n=n+1
```

```
loop until m.byte(n)=0
#endif
```

Notes: The MBS Plugin has an EnvironmentMBS class for this.

5.0.40 How can i get similar behavior to Roxio Toast or iTunes where clicking a 'burn' button allows the next inserted blank CD-R to bypass the Finder and be accepted by my application?

Plugin Version: all, Platform: macOS.

Answer: You need to get a media reservation.

Example:

```
dim d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

Notes: Use the plugin function AcquireMediaReservation and later release it using ReleaseMediaReservation.

See plugin examples on how to use it and check Apples DiscRecording framework documentation for more details.

5.0.41 How can I get text from a PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Crossplatform you can use DynaPDF Pro.

Notes: On Mac OS X you can also use PDFKit for the same job.

While DynaPDF Pro gives you each bit of text with rotation, font information and encoding details, PDFKit gives you only the text string for a PDF page.

5.0.42 How can I get text from a Word Document?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: to get the text string from a doc file, use the NSAttributedStringMBS class.

Notes: The NSAttributedStringMBS class is Mac OS X only and we have currently no solution for Windows or Linux.

Use the `NSAttributedStringMBS.initWithDocFormat(data as string)` as boolean method.

5.0.43 How can I get the item string for a given file creator?

Plugin Version: all.

Answer: Try this function:

Example:

```
Sub pullNativeDocs(aCREA As string)
Dim result as Integer
Dim m, k as memoryBlock
Dim f as folderItem
Dim newType as string
Dim anIcon As picture
Dim ofs as Integer
```

```
Declare Function GetFileTypesThatAppCanNativelyOpen Lib "Carbon" (appVRefNumHint as Short, appSignature as OSType, nativeTypes as Ptr) as Short Inline68K("701CABFC")
Declare Function GetDocumentKindString Lib "Carbon" (docVRefNum as Short, docType as OSType, docCreator as OSType, kindString as ptr) as Short Inline68K("7016ABFC")
```

```
listBox1.deleteAllRows
```

```
m = newMemoryBlock(1024)
result = GetFileTypesThatAppCanNativelyOpen(Volume(0).MacVRefNum, aCREA, m)
if result <> 0 then
listBox1.addRow "<Not found.>"
return
end if
```

```
do
if m.byte(ofs*4) = 0 then
exit
else
newType = m.OSTypeMBS(ofs*4)
listBox1.addRow newType
k = newMemoryBlock(64)
result = GetDocumentKindString(Volume(0).MacVRefNum, newType, aCREA, k)
if result = 0 then
listBox1.cell(ofs,1) = k.pString(0)
ofs = ofs + 1
else
listBox1.cell(ofs,1) = "(unknown)"
end if
end if
```

loop

End Sub

Notes: Change "Translation" to "CarbonLib" for Mac OS X.

5.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):

Example:

```
Function LaunchByCreator(C As String) As Boolean
Dim A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function
```

5.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please use the ldd command in the terminal.

Notes: You build an app on any platform, but for Linux.

For the resulting .so files in the libs folder, you can run the ldd command with the library path as parameter. It shows you references lib files and you can make sure you have those installed.

This is a sample run of our graphicsmagick plugin:

```
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$ ldd libMBSGraphicsMagickPlugin17744.so
linux-gate.so.1 =>(0xb76ee000)
libdl.so.2 =>/lib/i386-linux-gnu/libdl.so.2 (0xb6f0e000)
libgtk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgtk-x11-2.0.so.0 (0xb6aa6000)
libpthread.so.0 =>/lib/i386-linux-gnu/libpthread.so.0 (0xb6a8a000)
libstdc++.so.6 =>/usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
libm.so.6 =>/lib/i386-linux-gnu/libm.so.6 (0xb6979000)
libgcc_s.so.1 =>/lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
libc.so.6 =>/lib/i386-linux-gnu/libc.so.6 (0xb67b1000)
```

```

/lib/ld-linux.so.2 (0xb76ef000)
libgdk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
libpangocairo-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
libX11.so.6 =>/usr/lib/i386-linux-gnu/libX11.so.6 (0xb65c0000)
libXfixes.so.3 =>/usr/lib/i386-linux-gnu/libXfixes.so.3 (0xb65ba000)
libatk-1.0.so.0 =>/usr/lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 =>/usr/lib/i386-linux-gnu/libcairo.so.2 (0xb64ce000)
libgdk_pixbuf-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb64ad000)
libgio-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgio-2.0.so.0 (0xb6356000)
libpangoft2-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
libpango-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
libfontconfig.so.1 =>/usr/lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
libgobject-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb625c000)
libglib-2.0.so.0 =>/lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
libXext.so.6 =>/usr/lib/i386-linux-gnu/libXext.so.6 (0xb6151000)
libXrender.so.1 =>/usr/lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
libXinerama.so.1 =>/usr/lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
libXi.so.6 =>/usr/lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
libXrandr.so.2 =>/usr/lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
libXcursor.so.1 =>/usr/lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
libXcomposite.so.1 =>/usr/lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
libXdamage.so.1 =>/usr/lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
libfreetype.so.6 =>/usr/lib/i386-linux-gnu/libfreetype.so.6 (0xb607b000)
libxcb.so.1 =>/usr/lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
libpixman-1.so.0 =>/usr/lib/i386-linux-gnu/libpixman-1.so.0 (0xb5fc2000)
libpng12.so.0 =>/lib/i386-linux-gnu/libpng12.so.0 (0xb5f98000)
libxcb-shm.so.0 =>/usr/lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f93000)
libxcb-render.so.0 =>/usr/lib/i386-linux-gnu/libxcb-render.so.0 (0xb5f89000)
libz.so.1 =>/lib/i386-linux-gnu/libz.so.1 (0xb5f73000)
libgmodule-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgmodule-2.0.so.0 (0xb5f6e000)
libselinux.so.1 =>/lib/i386-linux-gnu/libselinux.so.1 (0xb5f4f000)
libresolv.so.2 =>/lib/i386-linux-gnu/libresolv.so.2 (0xb5f36000)
libexpat.so.1 =>/lib/i386-linux-gnu/libexpat.so.1 (0xb5f0c000)
libffi.so.6 =>/usr/lib/i386-linux-gnu/libffi.so.6 (0xb5f05000)
libpcre.so.3 =>/lib/i386-linux-gnu/libpcre.so.3 (0xb5ec9000)
librt.so.1 =>/lib/i386-linux-gnu/librt.so.1 (0xb5ec0000)
libXau.so.6 =>/usr/lib/i386-linux-gnu/libXau.so.6 (0xb5ebb000)
libXdmcp.so.6 =>/usr/lib/i386-linux-gnu/libXdmcp.so.6 (0xb5eb4000)
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$

```

As you see all library have been found and their load address is printed behind the na,e. If a library is missing, you usually see the address missing there or being zero.


```

while theRegexMatch <>nil
theStart = theRegexMatch.subExpressionStartB(0) + len(theRegexMatch.subExpressionString(0))

result = result + theRegexMatch.subExpressionString(1)
infoCharset = theRegexMatch.subExpressionString(2)
encodedPart = theRegexMatch.subExpressionString(4)
if theRegexMatch.subExpressionString(3) = "B" then
encodedPart = DecodeBase64(encodedPart)
elseif theRegexMatch.subExpressionString(3) = "Q" then
encodedPart = DecodeQuotedPrintable(encodedPart)
end if
if right(result, 1) = " " then
result = mid(result, 1, len(result)-1)
end if
encodedPart = encodedPart.DefineEncoding(GetInternetTextEncoding(infoCharset))
result = result + encodedPart

theRegex.SearchStartPosition = theStart
theRegexMatch = theRegex.search()
wend

result = result + mid(src, theStart+1)

else
result = src
end if
// theRegexMatch = theRegex.search

msgbox result

```

Notes: May not look nice depending on the controls used.
This is no longer needed when using MimeEmailMBS class which decodes for you.

5.0.48 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Platform: macOS.

Answer: Use the TabpanelEnabledMBS method.

Example:

```
TabpanelEnabledMBS(tabpanel1, 1, false)
```

Notes: Use Carbon for MachO and CarbonLib for Mac Carbon and AppearanceLib for Mac OS Classic as

library.

For Cocoa, please use enabled property of NSTabViewItemMBS class.

5.0.49 How do I find the root volume for a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```
Function GetRootVolume(f as FolderItem) as FolderItem
dim root, dum as folderItem
if f <> nil then
root = f // f might be the volume
do
dum = root.parent
if dum <> nil then
root = dum
end if
loop until dum = nil
return root
end if
End Function
```

5.0.50 How do I get the current languages list?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
dim p as new CFPReferencesMBS
dim a as CFArrayMBS
dim s as CFStringMBS
dim o as CFOBJECTMBS
dim sa(-1) as string

o=p.CopyAppValue("AppleLanguages", ".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

dim i,c as Integer
```

```
c=a.Count-1
for i=0 to c
o=a.Item(i)

if o isa CFStringMBS then
s=CFStringMBS(o)
sa.Append s.str
end if
next
end if

MsgBox Join(sa,EndOfLine)
```

Notes: On Mac OS X you can get the list of current languages like this list:

```
de
en
ja
fr
es
it
pt
pt-PT
nl
sv
nb
da
fi
ru
pl
zh-Hans
zh-Hant
ko
```

Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

5.0.51 How do I get the Mac OS Version?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

dim i as Integer
if system.gestalt("sysv", i) then
//do this in an 'If' in case you don't get any value back at all and system.gestalt returns boolean
if i = &h750 then //If OS is 7.5
//do stuff
elseif i = &h761 then //If OS is 7.6.1
//do stuff
end if
end if

```

Notes: The MBS Plugin has a function SystemInformationMBS.OSVersionString for this.

5.0.52 How do I get the printer name?

Plugin Version: all.

Answer: For Mac OS Classic see the code below and for Mac OS X use the Carbon Print Manager Classes from the MBS Plugin.

Example:

```

dim s as String
dim i as Integer

s=app.ResourceFork.GetResource("STR ",-8192)
if s<>"" then
i=ascb(leftb(s,1))
s=mid(s,2,i)

MsgBox s
end if

```

Notes: A note from Craig Hoyt:

After looking at your example I had a little deja-vu experience. Several years ago I played around with this same code if FutureBasic. I discovered that it did not and still doesn't provide the 'Printer Name', it does return the print driver name. If it returns 'LaserWriter 8' as the print driver you can look into this file and get the 'PAPA' resource #-8192 to get the actual Printer Name. Unfortunately this does not hold true for other printers. My Epson and HP Printers (the Epson has an Ethernet Card and the HP is USB) do not provide this info in their drivers. As far as I can tell it only returns the name by polling the printer itself.

5.0.53 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Platform: macOS.

Answer: The following declare turns any window on Mac OS X 10.2 or newer into a metal one.

Example:

```
declare sub ChangeWindowAttributes lib "Carbon" (win as windowptr, a as Integer, b as Integer)
```

```
ChangeWindowAttributes window1,256,0
```

Notes: May not look nice depending on the controls used.

5.0.54 How do I make a smooth color transition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I'd like to show in a report some bars, which start with color A and end with color B.

The color change should be very smooth.

My problem: If I would start from 255,0,0 and end by 0,0,0, I would have 255 different colors. If the bars are longer than 255 pixels, would this look nice?

Example:

```
// Window.Paint:
Sub Paint(g As Graphics)
dim w,w1,x,p as Integer
dim c1,c2,c as color
dim p1,p2 as Double

c1=rgb(255,0,0) // start color
c2=rgb(0,255,0) // end color

w=g.Width
w1=w-1

for x=0 to w1
p1=x/w1
p2=1.0-p1
```

```

c=rgb(c1.red*p1+c2.red*p2, c1.green*p1+c2.green*p2, c1.blue*p1+c2.blue*p2)

g.ForeColor=c
g.DrawLine x,0,x,g.Height

next
End Sub

```

Notes:

Try the code above in a window paint event handler.

5.0.55 How do I read the applications in the dock app?

Plugin Version: all, Platform: macOS.

Answer: Use CFPREFERENCESMBS class like in this example:

Example:

```

// Reads file names from persistent dock applications and puts them into the list

dim pref as new CFPREFERENCESMBS

dim persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
dim ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
dim tiledata as CFStringMBS = NewCFStringMBS("tile-data")
dim filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
dim o as CObjectMBS = 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.

5.0.56 How do I truncate a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In a `binarystream` you can set the `length` property to truncate.

5.0.57 How do update a Finder's windows after changing some files?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

dim f as folderitem // some file
dim ae as appleevent
ae=newappleevent("fndr","fupd","MACS")
ae.folderitemparam("—")=f
if not ae.send then
//something went wrong

```

end if

Notes: The `folderitem.finderupdate` from the MBS Plugin does something like this.

5.0.58 How to access a USB device directly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: First, it depends on the device.

Notes: Some devices can be talked directly from user mode code, but some require a kernel driver.

For some devices you can use plugins to access them like:

- Audio and Video sources using the `QTGrabberClassMBS`
- Mass storage devices using the `folderitem` class.
- Serial devices using the `System.SerialPort` function.
- HID USB devices can be used with `MacHIDMBS`, `WinHIDMBS` or `LinuxHIDInterface` class.
- Any USB device may be used with `MacUSBMBS` or `WinUSBMBS` classes.

In general it is always the best to take the most high level access to have others do the work for the details.

5.0.59 How to add icon to file on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use `FolderItem.AddCustomIcon` or `NSWorkspaceMBS.setIcon` functions.

Notes: Please close any open stream for the file you want to add an icon.

5.0.60 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Platform: macOS.

Answer: Using Apple Events you can use this code:

Example:

Function `Computername()` *As string*

```

dim theEvent as AppleEvent
dim err as boolean

theEvent = newAppleEvent("mchn","getd","MACS")

err = theEvent.send

return theevent.ReplyString

End Function

```

Notes: Code above is for Mac OS 9!

Also the MBS Plugin has a function for this which may be faster and work also on Macs without Filesharing (which handles this event).

5.0.61 How to automatically enable retina in my apps?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSHighResolutionCapable""
YES")

```

Notes: This will set the NSHighResolutionCapable flag to YES.

5.0.62 How to avoid leaks with Cocoa functions?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```

// in a Timer Action event:
Sub Action()
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

```

```

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS

```

End Sub

Notes: With Xojo 2009r4 the code above should not be needed as Xojo runtime does automatically handle the `NSAutoreleasePools` for you. For older Xojo versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use Xojo 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a `objc_msgSend` call.

5.0.63 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Platform: macOS.

Answer: For oracle the most important thing is to point the plugin to the libraries from oracle.

Notes: In environment variables, the paths like `ORACLE_HOME` must be defined.

On Mac OS X you also need to define `DYLD_LIBRARY_PATH` to point to the dylib files from oracle.

For that you need to modify `/etc/launchd.conf` for Mac OS X 10.8 and newer.

In older versions those variables in `.MacOSX/environment.plist` file in user's home.

Another way for the case you bundle things inside your app is to use the `LSEnvironment` key in `info.plist`. In `info.plist` it looks like this:

```
<key>LSEnvironment</key>
<dict>
<key>test</key>
<string>Hello World</string>
</dict>
```

5.0.64 How to avoid `___NSAutoreleaseNoPool` console messages in threads?

Plugin Version: all, Platform: macOS.

Answer: You need to use your own `NSAutoreleasePool` on a thread like this:

Example:

```
sub MyThread.run
dim pool as new NSAutoreleasePoolMBS
// do work here

pool=nil
```

end sub

Notes: For more details read here:

http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutoreleasePool_Class/Reference/Reference.html

5.0.65 How to bring app to front?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use this code:

Example:

```
// First way:
app.FrontMostMBS = true
```

```
// second way:
dim p as new ProcessMBS
p.GetCurrentProcess
p.FrontProcess = true
```

```
// third way:
NSApplicationMBS.sharedApplication.activateIgnoringOtherApps(true)
```

```
// for Windows:
RemoteControlMBS.WinBringWindowToTop
```

Notes: This will bring a Mac app to the front layer.

5.0.66 How to bring my application to front?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code txt) 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)

5.0.67 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use SignalHandlerMBS class for this.

Example:

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

dim ende as boolean = false
do
if SignalHandlerMBS.IsFlagSet(2) then
Print "Flag 2 set. Existing..."
ende = true
end if

DoEvents 1
loop until ende
```

Notes: The signal is caught, a flag is set and you can ask later in your normal application flow for the result.

5.0.68 How to change name of application menu?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use this code to change the application menu name on Mac OS X:

Example:

```
dim mb as new MenubarMBS
dim m as MenuMBS = mb.item(1) // 1 is in my tests the app menu
if m<>Nil then
m.MenuTitle = "Hello World"
end if
```

Notes: This code is for Carbon only.

5.0.69 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer:

You mean it screws up if the file name of the bundle itself is different than the name of the executable file in the MacOS folder within the bundle? If so, you should find something like this within your Info.plist file (or the 'plst' resource that the RB IDE builds for you):

```
<key>CFBundleExecutable</key>
<string>Executable file name here</string>
```

Just make sure that file name matches.

However, if your question involves how you can change the name of the app that appears in the menu and the dock, that's different. You can make this name different from the file name by changing the CFBundleName key:

```
<key>CFBundleName</key>
<string>Name for menu here</string>
```

Note that if you use my free AppBundler program, this second part is taken care of for you – just fill in a custom name in the right field. You can find AppBundler (from Thomas Reed) at <http://www.bitjuggler.com/products/appbundler/>.

5.0.70 How to check if a folder/directory has subfolders?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this to check all items in a folder:

Example:

```
Function HasSubFolder(folder as FolderItem) As Boolean
dim c as Integer = folder.Count
```

```
for i as Integer = 1 to c
dim item as FolderItem = folder.TrueItem(i)
```

```
if item<>Nil and item.Directory then
Return true
end if
```

next

End Function

Notes: We use trueitem() here to avoid resolving alias/link files. Also we check for nil as we may not have permission to see all items. And if one is a directory, we return without checking the rest.

5.0.71 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Platform: macOS.

Answer: Please use our IOPowerSourcesMBS class like this:

Example:

```
Function PowerSourceState() as Integer
dim p as new IOPowerSourcesMBS

// check all power sources
dim u as Integer = p.Count-1
for i as Integer = 0 to u
dim d as CFDictionaryMBS = p.Item(i)
if d<>nil then
// check if they have a power source state key:
dim o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
if o isa CFStringMBS then
dim s as string = CFStringMBS(o).str

'MsgBox s

if s = "AC Power" then
Return 1
elseif s = "Battery Power" then
Return 2
end if
end if
end if
next
Return 0 // unknown
End Function
```

Notes: If you want to check the CFDictionaryMBS content, simply use a line like "dim x as dictionary = d.dictionary" and check the contents in the debugger.

5.0.72 How to check if Microsoft Outlook is installed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you need Outlook for Scripting, you should simply check registry for the required Outlook.Application class:

Example:

```
Function OutlookInstalled() As Boolean
    #if TargetWin32 then

    try
    dim r as new RegistryItem("HKEY_CLASSES_ROOT\Outlook.Application\CLSID", false)

    Return true

    catch r as RegistryAccessErrorException
    // not installed
    Return false

    end try

    #else

    // Windows only, so false on other platforms
    Return false

    #endif

End Function
```

5.0.73 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Platform: macOS.

Answer: The code below returns a country value.

Example:

```
dim result as Integer

IF TargetMacOS THEN

CONST smScriptLang = 28
```

```

CONST smSystemScript = -1

DECLARE FUNCTION GetScriptManagerVariable LIB "Carbon" ( selector as Integer) as Integer
DECLARE FUNCTION GetScriptVariable LIB "Carbon" ( script as Integer, selector as Integer) as Integer

result=GetScriptVariable(smSystemScript, smScriptLang)

END IF

```

Notes: Returns values like:

For more values, check "Script.h" in the frameworks.

5.0.74 How to code sign my app with plugins?

Plugin Version: all, Platform: macOS.

Answer: When you try to code sign the application with plugin dylibs on Mac OS X, you may see error message that there is actually a signature included.

Notes: Please use the -f command line parameter with codesign utility to overwrite our MBS signature. We sign our plugins for MacOS, iOS and Windows to make sure they have not been modified.

In terminal, you do like this:

```
cd <Path to folder of app>
```

```

xattr -cr <Appname>.app
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.dylib
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.framework
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app

```

Please use the name of your certificate (See keychain), the name of your app and the path to the app folder. If you have helper apps you need to sign them first.

You can use a build step to automatically sign your app on build.

5.0.75 How to collapse a window?

Plugin Version: all, Platform: macOS.

Answer: Use this function (Mac only):

Example:

```
Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
dim state, err as Integer
dim wh as MemoryBlock
```

```
Declare Function CollapseWindow Lib "Carbon" (window as Integer, collapse as Integer) as Integer
```

```
IF CollapseStatus THEN
state = 1
ELSE
state = 0
END IF
```

```
err = CollapseWindow(w.MacWindowPtr, state)
```

```
End Sub
```

Notes: Also the MBS Plugin has a window.collapsedmbs property you can set. For Windows the MBS Plugin has a window.isiconicmbs property.

5.0.76 How to compare two pictures?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:

Example:

```
Function ComparePictures(p as picture,q as picture) as Integer
dim r,u as RGBSurface
dim x,y,n,m,h,w as Integer
dim w1,w2,h1,h2,d1,d2 as Integer
dim c1,c2 as color
```

```
h1=p.Height
h2=q.Height
w1=p.Width
w2=q.Width
d1=p.Depth
d2=q.Depth
```

```
if d1<>d2 then
Return 1
elseif w1<>w2 then
```

```

return 2
elseif h1<>h2 then
Return 3
else
r=p.RGBSurface
u=q.RGBSurface

if r=nil or u=nil then
Return -1
else
h=h1-1
w=w1-1
m=min(w,h)

for n=0 to m
c1=r.Pixel(n,n)
c2=u.Pixel(n,n)
if c1<>c2 then
Return 4
end if
next

for y=0 to h
for x=0 to w
c1=r.Pixel(x,y)
c2=u.Pixel(x,y)
if c1<>c2 then
Return 5
end if
next
next

// 0 for equal
// -1 for error (no RGBsurface)
// 1 for different depth
// 2 for different width
// 3 for different height
// 4 for different pixels (fast test)
// 5 for different pixels (slow test)
end if
end if

Exception
Return -1
End Function

```

Notes: Remember that this only works on bitmap pictures, so the `picture.BitmapMBS` function may be useful.

5.0.77 How to compile PHP library?

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: This instructions were written based on PHP 5.2.6 on Mac OS X:

- Best take a new Mac with current Xcode version installed.
- Download the source code archive. e.g. "php-5.2.6.tar.bz2"
- Expand that archive on your harddisc.
- Open terminal window
- change directory to the php directory. e.g. "cd /php-5.2.6"
- execute this two lines to define the supported CPU types and the minimum Mac OS X version:
- export CFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- export CXXFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- the command "./configure help" does show the configure options.
- use configure with a line like this:
- ./configure --enable-embed --with-curl --enable-ftp --enable-zip --enable-sockets --enable-static --enable-soap --with-zlib --with-bz2 --enable-exif --enable-bcmath --enable-calendar
- start the compilation with "make all"
- other option is to use "make install" which first does the same as "make all" and than does some installation scripts.
- you may get an error about a duplicate symbole __yytext. Search the file "zend_ini_scanner.c", search a line with "char *yytext;" and change it to "extern char *yytext;"
- On the end you get a lot of error messages, but you have a working library (named libphp5.so) file in the invisible ".libs" folder inside your php source folder.

Possible problems and solutions:

- If the path to your files has spaces, you can get into trouble. e.g. "/RB Plugins/PHP" is bad as files will be searched sometimes in "/RB".

- If you have in /usr/local/lib libraries which conflict with the default libraries, you can get into trouble.
- If you installed some open source tools which compiled their own libraries, you can get into conflicts.
- if you have to reconfigure or after a problem, you may need to use "make clean" before you start "make all" again.

Feel free to install additional libraries and add more packages to the configure line.

5.0.78 How to convert a `BrowserType` to a `String` with `WebSession.Browser`?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
case WebSession.BrowserType.Android
Return "Andriod"
case WebSession.BrowserType.Blackberry
Return "Blackberry"
case WebSession.BrowserType.Chrome
Return "Chrome"
case WebSession.BrowserType.ChromeOS
Return "ChromeOS"
case WebSession.BrowserType.Firefox
Return "Firefox"
case WebSession.BrowserType.InternetExplorer
Return "InternetExplorer"
case WebSession.BrowserType.Opera
Return "Opera"
case WebSession.BrowserType.Safari
Return "Safari"
case WebSession.BrowserType.SafariMobile
Return "SafariMobile"
case WebSession.BrowserType.Unknown
Return "Unknown"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

5.0.79 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetRenderingEngineName(s as WebSession.EngineType) As string
Select case s
case WebSession.EngineType.Gecko
Return "Gecko"
case WebSession.EngineType.Presto
Return "Presto"
case WebSession.EngineType.Trident
Return "Trident"
case WebSession.EngineType.Unknown
Return "Unknown"
case WebSession.EngineType.WebKit
Return "WebKit"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

5.0.80 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetPlatformName(s as WebSession.PlatformType) As string
Select case s
case WebSession.PlatformType.Blackberry
Return "Blackberry"
case WebSession.PlatformType.iPad
Return "iPad"
case WebSession.PlatformType.iPhone
Return "iPhone"
case WebSession.PlatformType.iPodTouch
Return "iPodTouch"
case WebSession.PlatformType.Linux
Return "Linux"
case WebSession.PlatformType.Macintosh
Return "Macintosh"
```

```

case WebSession.PlatformType.PS3
Return "PS3"
case WebSession.PlatformType.Unknown
Return "Unknown"
case WebSession.PlatformType.WebOS
Return "WebOS"
case WebSession.PlatformType.Wii
Return "Wii"
case WebSession.PlatformType.Windows
Return "Windows"
else
Return "Unkown: "+str(integer(s))
end Select

```

End Function

5.0.81 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

dim outstring as string
dim theMac, thePC as textencoding
dim Mac2PC as textconverter

theMac = getTextEncoding(0) // MacRoman
thePC = getTextEncoding(&h0201) // ISOLatin1

Mac2PC = getTextConverter(theMac, thePC)
// if you wanted to do the opposite just create a converter
// PC2Mac = getTextConverter(thePC, theMac)

outstring = Mac2PC.convert("Bj√rn, this text should be converted")
Mac2PC.clear

```

Notes:

You have to call Mac2PC.clear after every conversion to reset the encoding engine.
See also newer TextConverterMBS class.

5.0.82 How to convert ChartTime back to Xojo date?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have this example code:

Example:

```
Function ChartTimeToDate(ChartTime as Double) As date
static diff as Double = 0.0

if diff = 0.0 then
dim d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
dim da as new date(2015, 1, 1)
dim ts as Double = da.TotalSeconds

diff = ts - d2
end if

dim d as new date
d.TotalSeconds = diff + ChartTime

Return d
End Function
```

Notes: As you see we calculate the difference in base date from Date and ChartTime and later use difference to convert.

5.0.83 How to convert line endings in text files?

Plugin Version: all, Platform: macOS.

Answer: You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.

Example:

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
dim it as TextInputStream = TextInputStream.Open(inputfile)
dim ot as TextOutputStream = TextOutputStream.Create(outputfile)

ot.Delimiter = EndOfLine.Windows // new line ending
while not it.EOF
ot.WriteLine it.ReadLine
wend
```

Notes: `TextInputStream` will read any input line endings and with `delimiter` property in `TextOutputStream` you can easily define your new delimiter.

5.0.84 How to convert picture to string and back?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use this plugin functions:

Notes: JPEG:

`JPEGStringToPictureMBS(buf as string)` as picture
`JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean)` as picture
`PictureToJPEGStringMBS(pic as picture,quality as Integer)` as string

PNG:

`PictureToPNGStringMBS(pic as picture, gamma as single)` as string
`PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single)` as string
`PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer)` as string
`PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer)` as string
`PNGStringToPictureMBS(data as string, gamma as single)` as picture
`PNGStringToPNGPictureMBS(data as string, gamma as single)` as PNGpictureMBS

Tiff:

`TIFFStringToPictureMBS(data as string)` as picture
`TIFFStringToTiffPictureMBS(data as string)` as TiffPictureMBS

BMP:

`BMPStringtoPictureMBS(data as string)` as picture
`Picture.BMPDataMBS(ResolutionValueDPI as Integer=72)` as string

GIF:

`GifStringToGifMBS(data as string)` as GIFMBS
`GifStringToPictureMBS(data as string)` as Picture

5.0.85 How to copy an array?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy an array:

Example:

```
Function CopyArray(a() as Double) as Double()
dim r() as Double
for each v as Double in a
r.Append v
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of an array of objects, you need to change code to also make a copy of those objects.

5.0.86 How to copy a dictionary?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy a dictionary:

Example:

```
Function CopyDictionary(d as Dictionary) As Dictionary
dim r as new Dictionary
for each key as Variant in d.keys
r.Value(key) = d.Value(key)
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of a dictionary of objects, you need to change code to also make a copy of those objects.

5.0.87 How to copy parts of a movie to another one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.

Example:

```

dim f as FolderItem
dim md as EditableMovie
dim ms as EditableMovie

f=SpecialFolder.Desktop.Child("Our First Snowman.mov")
ms=f.OpenEditableMovie

ms.SelectionStartMBS=5
ms.SelectionLengthMBS=10

f=SpecialFolder.Desktop.Child("dummy.mov")
md=f.CreateMovie

msgbox str(md.AddMovieSelectionMBS(ms))

```

Notes: If result is not 0, the method fails.

5.0.88 How to create a birthday like calendar event?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every
year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

dim calendars() as CalCalendarMBS = s.calendars

```

```

// set properties
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(0) // add to first calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if

```

Notes: This adds an event to iCal for the given date with alarm to remember you and repeats it every year.

5.0.89 How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the UUIDMBS class for this.

5.0.90 How to create a Mac picture clip file?

Plugin Version: all, Platform: Windows.

Answer: You can use code like this one.

Example:

```

dim f As FolderItem
dim p As Picture

f=SpecialFolder.Desktop.Child("Test.pictClipping")
if f=nil then Return

p=new Picture(300,200,32) 'Make a sample picture
p.Graphics.ForeColor=RGB(0,255,255)
p.Graphics.FillOval 0,0,99,99

```

```
p.Graphics.ForeColor=RGB(255,0,0)
p.Graphics.DrawOval 0,0,99,99
```

```
dim r As ResourceFork 'ResourceFork is needed for a clip file
```

```
// Please define a file type Any
r=f.CreateResourceFork("Any")
```

```
// get PICT data using plugin function
dim pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")
```

```
dim m as new MemoryBlock(8)
```

```
m.LittleEndian = false
m.Int16Value(0) = 0
m.Int16Value(2) = 0
m.Int16Value(4) = p.Width
m.Int16Value(6) = p.Height
```

```
r.AddResource(m,"RECT",256,"")
```

```
'Values taken from a sample file and irrelevant to the problem
```

```
dim data as string = DecodeBase64("AQAAAAAAAAAAAAAAAAACAFRDRVIAAAABAAAAAAAAAAABUQ0IQAAAAA")
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

5.0.91 How to create a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check our DynaPDF plugin and the examples.

Notes: An alternative can be to use the CoreGraphics and Cocoa functions on Mac OS X. For Windows, we can only suggest our DynaPDF plugin.

5.0.92 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Platform: macOS.

Answer: You can use code like the one below:

Example:

Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
 dim a as new EmailAttachment

```
a.data = EncodeBase64(PDFData, 76)
a.ContentEncoding = "base64"
a.MIMETYPE = "application/pdf"
a.MacType = "PDF "
a.MacCreator = "prvw"
a.Name = filename
```

Return a

End Function

Notes: Compared to sample code from Xojo documentation, we set the mime type correct for PDF. The MacType/MacCreator codes are deprecated, but you can still include them for older Mac email clients. "prvw" is the creator code for Apple's preview app.

5.0.93 How to create PDF for image files?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use DynaPDF like this:

Example:

```
Function CreatePrintPDF(jpgFiles() as folderitem, pdfFile as FolderItem, PageWidth as Integer, PageHeight as Integer) As Boolean
  // have files?
  If pdfFile = Nil Then Return False
  If jpgFiles = Nil Then Return False

  If jpgFiles.Ubound < 0 Then Return False

  // new DynaPDF
  Dim pdf As New MyDynapdfMBS

  // page width/height in MilliMeter
  Dim pdfWidth as Integer = PageWidth * 72 / 25.4
  Dim pdfHeight as Integer = PageHeight * 72 / 25.4

  // put your license here
  Call pdf.SetLicenseKey "Starter"

  // create pdf
  Call pdf.CreateNewPDF pdfFile
```

```

// set a couple of options
Call pdf.SetPageCoords(MyDynaPDFMBS.kpcTopDown)
Call pdf.SetResolution(300)
Call pdf.SetUseTransparency(False)
Call pdf.SetSaveNewImageFormat(False)
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
Call pdf.SetJPEGQuality(100)

// set page size
Call pdf.SetBBox(MyDynaPDFMBS.kpbMediaBox, 0, 0, pdfWidth, pdfHeight)
Call pdf.SetPageWidth(pdfWidth)
Call pdf.SetPageHeight(pdfHeight)

// append pages with one image per page
For i as Integer = 0 To jpgFiles.Ubound
Call pdf.Append
Call pdf.InsertImageEx(0, 0, pdfWidth, pdfHeight, jpgFiles(i), 1)
Call pdf.EndPage
Next

// close
Call pdf.CloseFile

Return True
End Function

```

Notes: This is to join image files in paper size to a new PDF.
e.g. scans in A4 into an A4 PDF.

5.0.94 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a few tips on how to translate command line CURL calls to plugin calls.

Notes: `curl -vX PUT http://localhost:5984/appserials/78569238475/DocumentRegister.docx?rev=3-25634563456 -data-binary @DocumentRegister.docx -H "Content-Type: application/msword"`

- The option `-v` means verbose. You can use `OptionVerbose` and listen for messages in the `DebugMessage` event.
- The option `-X PUT` means we want to do a HTTP PUT Request. So set `OptionPut` to true. Also you will want to set `OptionUpload` to true as you upload data.
- We have the URL which you put into `OptionURL` property.

- The `-data-binary` option tells CURL to pass the given data. With the `@` before the data, it is interpreted as a file name, so the data is read from the given file. You'll need to open this file and pass data with the Read event as needed. (See CURLS ftp file upload example project)
- The last option `-H` specifies an additional header for the upload. Pass this additional header with the `SetOptionHTTPHeader` method.

```
curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfc4328001c59 -d '{ "type": "Product", "description": "Application Serial", "acronym": "AppSerial", "dateAdded": "2011-03-21 14:57:36" } '
```

- Option `-X PUT` like above.
- Pass the URL again in `OptionURL`
- This time data is passed in command line for CURL. You'd put this data in the quotes into a string and make it available in the Read event. (See CURLS ftp upload example project)

5.0.95 How to delete file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
dim d as CURLMBS // your curl object
```

```
// delete file
```

```
dim ws() As String
```

```
ws.Append "DELE Temp.txt"
```

```
d.SetOptionPostQuote(ws)
```

Notes: Use `SetOptionPostQuote`, `SetOptionPreQuote` or `SetOptionQuote`.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. To delete use `DELE` and the file path.

5.0.96 How to detect display resolution changed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X simply listen for display changed notifications.

Notes: Use the "Distribution Notification Center.rbp" example project as a base and use it to listen to notifications with the name "O3DeviceChanged".

5.0.97 How to detect retina?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use `Window.BackingScaleFactorMBS` to query the factor.

Example:

```
msgbox str(window1.BackingScaleFactorMBS)
```

5.0.98 How to disable force quit?

Plugin Version: all, Platform: macOS.

Answer:

Please visit this website and get the control panel for Mac OS 9 there:

<http://www3.sk.sympatico.ca/tinyjohn/DFQ.html>

For Mac OS X use the MBS Plugin with the `SetSystemUIModeMBS` method.

Notes:

Please use `presentationOptions` in `NSApplicationMBS` for Cocoa applications.

5.0.99 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Platform: Windows.

Answer: You can use this code in the `htmlviewer` open event:

Example:

```
if targetwin32 then
htmlviewer1._ole.Content.value("Silent") = True
end if
```

Notes: This disables the error dialogs from Internet Explorer.

5.0.100 How to display a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X you can use CoreGraphics or PDFKit to display a PDF.

Notes: An alternative can be to load the PDF into a htmlviewer so the PDF plugin can display it.

On Windows you may need to use the Acrobat ActiveX control from Adobe or launch Acrobat Reader.

5.0.101 How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```
Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next

' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub
```



```

b=true
x=x1
while (x<x2) and (y<y2)
  ox=x
  oy=y

  x=x+dx
  y=y+dy

  if b then
    g.DrawLine ox,oy,x,y
  end if

  b=not b
wend

```

End Sub

Notes: It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

5.0.104 How to draw a nice antialiased line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

Sub drawLine(xs as Integer, ys as Integer, xe as Integer, ye as Integer, face as RGBSurface, lineColor as
color)
  dim intX, intY, count, n, xDiff, yDiff as Integer
  dim v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
  dim c as color

  const st=1.0

  xDiff=xe-xs
  yDiff=ye-ys
  count=max(abs(xDiff), abs(yDiff))
  xStep=xDiff/count
  yStep=yDiff/count

```

```

xx=xs
yy=ys
for n=1 to count
intX=xx
intY=yy
floatX=xx-intX
floatY=yy-intY

v=(1-floatX)*(1-floatY)*st
v1=1-v
c=face.pixel(intX, intY)
face.pixel(intX, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*(1-floatY)*st
v1=1-v
c=face.pixel(intX+1, intY)
face.pixel(intX+1, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=(1-floatX)*floatY*st
v1=1-v
c=face.pixel(intX, intY+1)
face.pixel(intX, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*floatY*st
v1=1-v
c=face.pixel(intX+1, intY+1)
face.pixel(intX+1, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)

xx=xx+xStep
yy=yy+yStep
next

End Sub

```

Notes:

PS: st should be 1 and face should be a RGBSurface or a Graphics object.

5.0.105 How to dump java class interface?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.

Notes: For example show ResultSet class: javap -s java.sql.ResultSet

5.0.106 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this function:

Example:

```
Function Duplicate(extends p as Picture) As Picture
#if RBVersion >= 2011.04 then
if p.HasAlphaChannel then

// create nw picture and copy content:
dim q as new Picture(p.Width, p.Height)
q.Graphics.DrawPicture p,0,0

Return q

end if
#endif

// create new picture
dim q as new Picture(p.Width, p.Height, 32)

// get mask
dim oldMask as Picture = p.mask(false)
if oldMask = nil then
// no mask, so simple copy
q.Graphics.DrawPicture p,0,0
Return q
end if

// remove mask
p.mask = nil

// copy picture and mask
q.Graphics.DrawPicture p, 0, 0
q.mask.Graphics.DrawPicture oldMask,0,0

// restore mask
p.mask = oldmask

Return q
End Function
```

Notes: Simply copy it to a module and call it like this: `q = p.duplicate`.

The code above works with old Xojo versions because of the `#if` even if your RS version does not support alpha channel pictures. This way it's future proof.

5.0.107 How to enable assistive devices?

Plugin Version: all, Platform: macOS.

Answer: You can use AppleScript code like below:

Notes: tell application "System Events"
activate

```
set UI elements enabled to true
```

```
return UI elements enabled
end tell
```

You can run this with AppleScriptMBS class.

5.0.108 How to encrypt a file with Blowfish?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")
```

```
// read input
```

```
dim bi as BinaryStream = BinaryStream.Open(fi)
```

```
dim si as string = bi.Read(bi.Length)
```

```
bi.Close
```

```
// encrypt
```

```
dim so as string = BlowfishMBS.Encrypt("MyKey",si)
```

```
// write output
```

```
dim bo as BinaryStream = BinaryStream.Create(fo)
```

```
bo.Write so
```

```
bo.Close
```

Notes: Of course you can decrypt same way, just use Decrypt function and of course swap files.

5.0.109 How to extract text from HTML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:

Example:

```
dim html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)
```

MsgBox text // shows: Gr√üë

Notes: You can use it together with RemoveHTMLTagsMBS to remove html tags. What you get will be the text without tags.

DecodingFromHTMLMBS turns HTML escapes back to unicode characters. Like ä to √§.

5.0.110 How to find empty folders in a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this code:

Example:

```
dim folder as folderitem // your folder

dim c as Integer = folder.count
for i as Integer = 1 to c
dim item as folderitem = folder.trueitem(i)
if item = nil then
// ignore
elseif item.directory then
// folder
if item.count = 0 then
// found empty folder
end if
end if
next
```

5.0.111 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Platform: macOS.

Answer: You can try Launch Services.

Example:

```
dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.NativePath
```

5.0.112 How to find network interface for a socket by it's name?

Plugin Version: all, Platform: macOS.

Answer: You can use our plugin to build a lookup table.

Example:

```
Function FindNetworkInterface(name as string) As NetworkInterface
name = name.trim

if name.len = 0 then Return nil

// search by IP/MAC
dim u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if n.IPAddress = name or n.MACAddress = name then
Return n
end if
next

// use MBS Plugin to build a mapping
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
dim map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
dim IPv4s() as string = n.IPv4s
dim IPv6s() as string = n.IPv6s

for each IPv4 as string in IPv4s
map.Value(IPv4) = n.Name
next
for each IPv6 as string in IPv6s
map.Value(IPv6) = n.Name
next
if n.MAC<>>" then
map.Value(n.MAC) = n.Name
```

```

end if
next

// now search interfaces by name, IPv4 or IPv6
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if map.Lookup(n.IPAddress, "") = name then
Return n
end if

if map.Lookup(n.MACAddress, "") = name then
Return n
end if
next

End Function

```

Notes: The code above uses a lookup table build using NetworkInterfaceMBS class to find the network interface by name.

5.0.113 How to find version of Microsoft Word?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```

// find Word
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.microsoft.Word", "")

// open bundle
dim c as new NSBundleMBS(f)

// read info
dim d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion", "")

```

Notes: Older versions of Word can be found with creator code "MSWD".

5.0.114 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Platform: macOS.

Answer: You probably connect with SSL and you have no valid certificate.

Example:

```
dim d as new CURLSMBS

// Disable SSL verification
d.OptionSSLVerifyHost = 0 // don't verify server
d.OptionSSLVerifyPeer = 0 // don't proofs certificate is authentic

// With SSL Verification:
dim cacert as FolderItem = Getfolderitem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2 // verify server
d.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
```

Notes: You can either use the code above to disable the SSL verification and have no security. Or you use the cacert file and enable the verification. Than you only get a connection if the server has a valid certificate.

see also:

<http://curl.haxx.se/ca/>

5.0.115 How to format double with n digits?

Plugin Version: all, Platform: macOS.

Answer: You can use the FormatMBS function for this.

Example:

```
dim d as Double = 123.4567890
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

d = 0.000000123456
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
```

```
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)
```

Notes: see FormatMBS for details.

In general %f is normal style, %e is scientific and %g is whichever gives best result for given space.

5.0.116 How to get a time converted to user time zone in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.GMTOffset property.

Example:

```
Sub Open()
// current date on server
dim d as new date
dim s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

dim t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

5.0.117 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: This function returns a handle for the frontmost window:

Example:

```
Function GetForegroundWindowHandle() as Integer
#if targetwin32 then
declare function GetForegroundWindow Lib "user32.dll" as Integer
Return GetForegroundWindow()
#endif
End Function
```

5.0.118 How to get CFAbsoluteTime from date?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use code like this:

Example:

```
dim d as new date
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim g as new CFGregorianCalendarMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

dim at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
dim x as Double = at.Value
```

```
MsgBox str(x)
```

Notes: As you see we need a timezone and put the date values in a gregorian date record. Now we can query absolute time for the given timezone.

5.0.119 How to get client IP address on web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.RemoteAddress property.

Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

5.0.120 How to get fonts to load in charts on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `SetFontSearchPath` method in the `CDBaseChartMBS` class to specify where your fonts are.

Example:

```
if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if

// also you can later switch default fonts:

dim Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf", "/usr/share/fonts/truetype/piboto/Pi
#EndIf
```

Notes: On macOS, iOS and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the `ttf-mscorefonts-installer` package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

5.0.121 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `AddFontSearchPath` method in the `DynaPDFMBS` class to specify where your fonts are.

Example:

```
dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if
```

Notes: On Mac OS X and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the `ttf-mscorefonts-installer` package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

5.0.122 How to get GMT time and back?

Plugin Version: all, Platform: macOS.

Answer: You can use the date class and the GMTOffset property.

Example:

```
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds,"0.0")+ " " +str(e.TotalSeconds, "0.0")

dim GMTTimeStamp as Double = e.TotalSeconds

// restore
dim f as new date

// add GMT offset here
f.TotalSeconds = GMTTimeStamp + f.GMTOffset*3600
// because here it's removed
f.GMTOffset = f.GMTOffset

MsgBox d.ShortTime+" (" +str(d.GMTOffset)+") " +str(d.TotalSeconds,"0.0")+EndOfLine+_
e.ShortTime+" (" +str(e.GMTOffset)+") " +str(e.TotalSeconds,"0.0")+EndOfLine+_
f.ShortTime+" (" +str(f.GMTOffset)+") " +str(f.TotalSeconds,"0.0")
```

Notes: It's sometimes a bit tricky with the date class as setting one property often changes the others.

5.0.123 How to get good crash reports?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check this website from the webkit website:

Notes: <http://webkit.org/quality/crashlogs.html>

5.0.124 How to get list of all threads?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the runtime module like in this function:

Example:

```
Function Threads() As Thread()
#pragma DisableBackgroundTasks
dim t() as Thread

Dim o as Runtime.ObjectIterator=Runtime.IterateObjects
While o.MoveNext
if o.Current isa Thread then
t.Append thread(o.current)
end if
Wend

Return t
End Function
```

Notes: This returns an array of all thread objects currently in memory.

The pragma is important here as it avoids thread switches which may cause a thread to be created or deleted.

5.0.125 How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the Webpage.ParametersReceived event.

Example:

```
Sub ParametersReceived(Variables As Dictionary)
for each key as Variant in Variables.keys
MsgBox key+" ->" +Variables.Value(key)
next
End Sub
```

Notes: The text encodings of this strings is not defined in Xojo 2010r5. Please use DefineEncoding.

5.0.126 How to get the color for disabled textcolor?

Plugin Version: all, Platform: macOS.

Answer: Ask the appearance manager:

Example:

```
Function GetThemeTextColor(inColor as Integer, inDepth as Integer, inColorDev as Boolean) As Color
declare function GetThemeTextColor lib "Carbon" (inColor as Integer, inDepth as Integer, inColorDev as
Boolean, outColor as Ptr) as Integer
```

```
dim i as Integer
```

```
dim col as MemoryBlock
```

```
col = newMemoryBlock(6)
```

```
i = GetThemeTextColor(inColor, inDepth, inColorDev, col)
```

```
return RGB(col.UShort(0)\256, col.UShort(2)\256, col.UShort(4)\256)
```

```
End Function
```

Notes: The color for this is:

```
const kThemeTextColorDialogInactive = 2.
```

```
c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)
```

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

5.0.127 How to get the current free stack space?

Plugin Version: all, Platform: macOS.

Answer: You can something like the code below:

Example:

```
Sub ShowStackSize()
```

```
dim threadid as Integer
```

```
dim size as Integer
```

```
declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
```

```
declare function ThreadCurrentStackSize lib "Carbon" (threadid as Integer, byref size as Integer) as short
```

```
if GetCurrentThread(threadid)=0 then
```

```
if 0=ThreadCurrentStackSize(threadid,size) then
```

```
MsgBox str(size)
```

```
end if
```

```
end if
```

End Sub

Notes: For Mac OS 9, use "ThreadLib" instead of "CarbonLib". You can use #if if you like for that.

5.0.128 How to get the current timezone?

Plugin Version: all, Platforms: macOS, Windows.

Answer:

You can use the TimeZoneMBS class or the CFTimeZoneMBS class.
Or code like below:

Example:

```
Function GMTOffsetInMinutes() as Integer
// Returns the offset of the current time to GMT in minutes.
// supports Mac OS and Windows, but not Linux yet (let me know if
// you have code for that, please)
//
// Note that the offset is not always an even multiple of 60, but
// there are also half hour offsets, even one 5:45h offset

// This version by Thomas Tempelmann (rb@tempel.org) on 25 Nov 2005
// with a fix that should also make it work with future Intel Mac targets.
//
// Using code from various authors found on the RB NUG mailing list

dim result, bias, dayLightbias as Integer
dim info as memoryBlock
dim offset as Integer

#if targetMacOS then

Declare Sub ReadLocation lib "Carbon" (location As ptr)

info = NewMemoryBlock(12)
ReadLocation info
if false then
// bad, because it does not work on Intel Macs:
'offset = info.short(9) * 256 + info.byte(11)
else
offset = BitwiseAnd (info.long(8), &hFFFFFF)
end

offset = info.short(9) * 256 + info.byte(11)
```

```

offset = offset \60
return offset

#endif

#if targetWin32 then

Declare Function GetTimeZoneInformation Lib "Kernel32" ( tzInfoPointer as Ptr ) as Integer
// returns one of
// TIME_ZONE_ID_UNKNOWN 0
// - Note: e.g. New Delhi (GMT+5:30) and Newfoundland (-3:30) return this value 0
// TIME_ZONE_ID_STANDARD 1
// TIME_ZONE_ID_DAYLIGHT 2

info = new MemoryBlock(172)
result = GetTimeZoneInformation(info)

bias = info.Long(0)
// note: the original code I found in the NUG archives used Long(84) and switched to Long(0)
// only for result=1 and result=2, but my tests found that Long(0) is also the right value for result=0

if result = 2 then
daylightBias = info.long(168)
end if
offset = - (bias + dayLightbias)
return offset

#endif

End Function

```

5.0.129 How to get the current window title?

Plugin Version: all, Platform: macOS.

Answer: The code below returns the current window title for the frontmost window on Mac OS X if Accessibility services are

Example:

```

Function CurrentWindowTitle() As string
// your application needs permissions for accessibility to make this work!

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

```

```

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

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

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

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

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

```

5.0.130 How to get the cursor blink interval time?

Plugin Version: all, Platform: macOS.

Answer: On Mac OS you can use GetCaretTime from the toolbox.

Example:

```
declare function GetCaretTime lib "Carbon" () as Integer
```

```
MsgBox str(GetCaretTime()+ " ticks")
```

Notes: 60 ticks make one second.

5.0.131 How to get the list of the current selected files in the Finder?

Plugin Version: all, Platform: macOS.

Answer:

Use the AppleScript like this one:

```
tell application "finder"
return selection
end tell
```

Which translates into this AppleEvent:

```
Process("Finder").SendAE "core,getd,'—':obj { form:prop, want:type(prop), seld:type(sele), from:'null'() }
"
```

and as Xojo code it looks like this:

Example:

```
dim ae as appleEvent
dim o1 as appleEventObjectSpecifier
dim f as folderItem
dim alist as appleEventDescList
dim i as Integer
dim dateiname as string

// setup the AppleEvent
o1=getpropertyObjectDescriptor( nil, "sele")
ae= newappleEvent("core", "getd", "MACS")
ae.objectSpecifierParam("—")=o1

// send it
if ae.send then
// got the list
alist=ae.replyDescList

// now show the list of filename into an editfield:

for i=1 to alist.count
f=alist.folderItem(i)

dateiname=f.name
// editfield1 with property "multiline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
```

end if

5.0.132 How to get the Mac OS system version?

Plugin Version: all, Platform: macOS.

Answer: The following code queries the value and displays the version number:

Example:

```

dim first as Integer
dim second as Integer
dim third as Integer
dim l as Integer

if System.Gestalt("sysv",l) then

Third=Bitwiseand(l,15)
second=Bitwiseand(l\16,15)
first=Bitwiseand(l\256,15)+10*Bitwiseand(l\256\16,15)
end if

if First>=10 then
msgbox "Mac OS X "+str(First)+" "+str(Second)+" "+str(third)
else
msgbox "Mac OS "+str(First)+" "+str(Second)+" "+str(third)
end if

```

5.0.133 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

Dim s As String
Dim b As Boolean
Dim i, resp as Integer

// Systemversion
b = System.Gestalt("sysv", resp)
If b then
s = Hex(resp)

```

```

For i =Len(s)-1 DownTo 1
s=Left(s,i)+””+Mid(s,i+1)
Next
MsgBox ”Systemversion: Mac OS ” + s
end if

```

Notes: The MBS Plugin has a SystemInformationMBS.OSVersionString function for this.

5.0.134 How to get the screensize excluding the task bar?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Use the Screen class with the available* properties.

5.0.135 How to get the size of the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Make yourself a class for the WindowRect with four properties:

```

Bottom as Integer
Left as Integer
Right as Integer
Top as Integer

```

Add the following method to your class:

```

Sub GetWindowRect(windowhandle as Integer)
dim err as Integer
dim mem as memoryBlock
#if targetwin32 then
Declare Function GetWindowRect Lib ”user32.dll” (hwnd as Integer, ipRect As Ptr) as Integer

mem = newmemoryBlock(16)
err = GetWindowRect(windowhandle, mem)
Left = mem.long(0)
Top = mem.Long(4)
Right = mem.Long(8)
Bottom = mem.Long(12)

```

```
#endif  
End Sub
```

Good to use for the MDI Master Window!

5.0.136 How to get the source code of a HTMLViewer?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
// for Windows:
```

```
msgbox HTMLViewer1.IEHTMLTextMBS
```

```
// for MacOS with WebKit 2.x:
```

```
msgbox HTMLViewer1.WKWebViewMBS.HTMLText
```

5.0.137 How to get Xojo apps running Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You need to install some require packages.

Notes: You need CUPS as well as GTK packages. On 64 bit systems also the ia32-libs package.

Please note that you need a x86 compatible Linux. So no PPC, Power, ARM or other CPUs.

5.0.138 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sometimes it may be better to use an extra application to process images.

Notes: A typical 32 bit app made with Xojo can use around 1.8 GB on Windows and 3 GB on Mac OS X. Some images may be huge, so that processing them causes several copies of the image to be in memory. With a 500 MB image in memory, doing a scale or rotation may require a temp image. So with source, temp and dest images with each 500 MB plus your normal app memory usage, you may hit the limit of Windows with 1.8 GB.

In that case it may be worth running a tool like gm in the shell class. gm is the command line version of GraphicsMagick. There you can run the 64 bit version which is not limited in memory like your own application. Also you can monitor progress and keep your app responsive.

5.0.139 How to handle tab key for editable cells in listbox?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this function:

Example:

```
Function HandleTabInList(list as listbox, row as Integer, column as Integer, key as String) As Boolean
// Handle tab character in Listbox.CellKeyDown event
```

```
Select case asc(key)
case 9
if Keyboard.AsyncShiftKey then
// back

// look for column left
for i as Integer = column-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row before
row = row - 1
if row >= 0 then
for i as Integer = list.ColumnCount-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
else
// forward

// look for column right
for i as Integer = column+1 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
```

```

// not found, so look in row below
row = row + 1
if row <list.ListCount then
for i as Integer = 0 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
end if
end Select
End Function

```

Notes: You call it from CellKeyDown event like this:

```

EventHandler Function CellKeyDown(row as Integer, column as Integer, key as String) As Boolean
if HandleTabInList(me, row, column, key) then Return true
End EventHandler

```

As you see in the code, we handle tab and shift + tab for moving back and forward. Also we wrap to previous/next row if needed. Feel free to extend this to wrap from last to first row or create a new row for editing.

5.0.140 How to hard link MapKit framework?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Our MapKit classes weak link the framework. If you need hard linking it for the App Store, you can add this method to a class:

Example:

```

Sub ReferenceMapKit()
// just put this in window or app class

#if TargetMachO and Target64Bit then
Declare sub testing Lib "MapKit" Selector "test" (id as ptr)
testing(nil)
#endif

End Sub

```

Notes: No need to call the method.

Just having it in a window or app, will cause the compiler to hard link the framework.

5.0.141 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.

Example:

```
dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer
CurrentFile.ForceDownload = true

// start the download
showurl(CurrentFile.url)
```

Notes: See our Create PDF example for the Xojo Web Edition.

5.0.142 How to hide all applications except mine?

Platform: macOS.

Answer: The code below will on Mac OS hide all applications except your one:

Example:

```
dim p as new ProcessMBS

p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

5.0.143 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Platform: Windows.

Answer: Set Internet Explorer to silent mode with code like this:

Example:

```
htmlviewer1._ole.Content.value("Silent") = True
```

Notes: Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

5.0.144 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you want to hide something in a chart, simply assign the kTransparent constant as color.

5.0.145 How to hide the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub HideCursor Lib "Carbon" () Inline68K("A852")
```

```
HideCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

5.0.146 How to insert image to NSTextView or TextArea?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to insert file:

Example:

```
// insert a file to textview
```

```
Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
```

```
// read to file
```

```

dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub

```

Notes: For TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

5.0.147 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You can use javascript to change the current window's location.

Example:

```

// load website
htmlviewer1.LoadURL "http://www.monkeybreadsoftware.net/addressbook-abpersonmbs.shtml"

// later jump to anchor named "16":

if TargetWin32 then
call HTMLViewer1.IERunJavaScriptMBS "window.location = ""#16""
end if

```

5.0.148 How to keep a movieplayer unclickable?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: To keep the user away from clicking on a playing Movie you can just drop a Canvas in front of the Movieplayer and take the clicks there.

Example:

```
Function Canvas1.MouseDown(X as Integer, Y as Integer) as boolean
return true // take it and do nothing
End Function
```

5.0.149 How to keep my web app from using 100% CPU time?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Linux and MacOS you can use renice command in the terminal. On Windows use the task manager to reduce priority.

Notes: If you launch your app with nohup on Linux or Mac OS X like this from the terminal or a script:

```
nohup /webapps/MyApp/MyApp &
```

you can simply have a second line saying this:

```
renice 20 $ !
```

which tells the system to lower priority to lowest value for the latest background process.

5.0.150 How to kill a process by name?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can kill a process (or application) by name if you loop over all the processes and kill the one you need.

Example:

```
dim p as new ProcessMBS
p.GetfirstProcess ' get first
do
if p.name = "TextEdit" then
call p.KillProcess
Return
end if
loop until not p.GetNextProcess
```

Notes: You may want to check the result of killProcess function. Not every user is allowed to kill every application.

5.0.151 How to know how many CPUs are present?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```
Function GetCPUCount() as Integer
Declare Function MPPProcessors Lib "Carbon" () as Integer
```

```
Return MPPProcessors()
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.

5.0.152 How to know the calling function?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use a helper function like this this code:

Example:

```
Public Function CallingFunction() as string
// Query name of calling function of a function
```

```
#Pragma BreakOnExceptions false
```

```
try
```

```
// raise a dummy exception
dim r as new NilObjectException
raise r
```

```
catch x as NilObjectException
```

```
// get stack
dim stack() as string = x.Stack
```

```
// pick function name and return
dim name as string = stack(2)
Return name
```

```
end try
End Function
```

Notes: You need to include function names in your application.

5.0.153 How to launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):

Example:

```
Dim a as AppleEvent
dim creator as string

creator = "MSIE" ' here the Internet Explorer

a = NewAppleEvent("aevt", "odoc", "MACS")
a.Timeout = -1

a.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf", nil, creator)

if not a.send then
msgBox "An error has occured"
else

end if
```

5.0.154 How to launch disc utility?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this code:

Example:

```
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.apple.DiskUtility", "")

if f<>Nil then
f.Launch
end if
```

Notes: This works even if people renamed the disc utility or moved it to another folder.

5.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You may try to embed your changes to the database between two transaction calls.

Example:

```
dim db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

Notes: This can increase speed by some factors.

5.0.156 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Platform: macOS.

Answer: You can use code like this:

Example:

```
Function NewRetinaImage(pic as Picture, mask as Picture = nil) As NSImageMBS
// first make a NSImageMBS from it
dim n as new NSImageMBS(pic, mask)

// now set to half the size, so we have 2x pixels for the image
n.size = new NSSizeMBS(n.width/2, n.height/2)

// and return
Return n
End Function
```

Notes: The thing to do is to have 2x the pixels, but assign a size to the image which gives it the right size in points.

You can pass the NSImageMBS from here to NSMenuItemMBS. For Retina displays, the full resolution is used. For others it will be reduced.

5.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this declares:

Example:

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).
```

```
Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &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, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer
```

```
styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )
```

```
#EndIf
```

5.0.158 How to make an alias using AppleEvents?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
```

```
dim ev as AppleEvent
```

```
dim myResult as boolean
```

```
dim properties as AppleEventRecord
```

```
ev = NewAppleEvent("core", "crel", "MACS")
```

```
ev.MacTypeParam("kocl") = "alis"
```

```
ev.FolderItemParam("to ") = target
```

```
ev.FolderItemParam("insh") = folder
```

```
properties=new AppleEventRecord
```

```

properties.StringParam("pnam")=aliasname

ev.RecordParam("prdt")=properties

myResult = ev.send
// true on success, false on error
End Sub

```

Notes: Call it like this:

```
MakeAlias SpecialFolder.Desktop, SpecialFolder.Desktop.Child("Gif Copy.rb"), "test.rb alias"
```

Seems to not work on Mac OS X 10.6

5.0.159 How to make AppleScripts much faster?

Plugin Version: all, Platform: macOS.

Answer: use "ignoring application responses" like in this example:

```

Notes: on run { fn,fpx,fpy }
ignoring application responses
tell app "Finder" to set the position of folder fn to fpx,fpy
end ignoring
end run

```

5.0.160 How to make double clicks on a canvas?

Plugin Version: all, Platform: macOS.

Answer:

Update: Newer Xojo versions support DoubleClick event, so you don't need this code.

Here's my tip from the tips list on how to add a double-click event to the Canvas control. The technique could easily be used for a window or any Rectcontrol:

Because of its built-in drawing methods, the Canvas control is often used to create custom interface controls. But while the Canvas control has event handlers for most mouse events, it doesn't have an event handler for DoubleClick events. Fortunately, you can add a double-click event handler to a Canvas control easily. Basically, you're going to create a new class based on Canvas and add a double-click event to that. You can then use the new class anytime you need a Canvas with a double-click event.

To create a new Canvas class with a DoubleClick event handler, do this:

1. Add a new class to your project.
2. Set the Super property of the new class to "Canvas".
3. Change the name of this new class to "DoubleClickCanvas".

A double-click occurs when two clicks occur within the users double-click time (set in the Mouse control panel on both Macintosh and Windows) and within five pixels of each other. So, you'll need a few properties to store when and where the last click occurred.

4. Add a new property with the following declaration and mark it as private: lastClickTicks as Integer
5. Add a new property with the following declaration and mark it as private: lastClickX as Integer
6. Add a new property with the following declaration and mark it as private: lastClickY as Integer

Since the Canvas control doesn't have a DoubleClick event, you will need to add one.

7. Add a new event to your class by choosing New Event from the Edit menu and enter "DoubleClick" as the event name.

Double-clicks occur on MouseUp. In order for the mouseUp event to fire, you must return True in the MouseDown event.

8. In the MouseDown event, add the following code:
Return True

In the MouseUp event, you will need to determine what the users double-click time is. This value is represented on both the Mac and Windows in ticks. A tick is 1/60th of a second. Since there isn't a built-in function for this, you'll need to make a toolbox call. The mouseUp event code below makes the appropriate toolbox call for both Macintosh and Windows. It then compares the time of the users last click to the time of the current click and compares the location of the users last click to the location of the current click.

9. Add the following code to the MouseUp event:

```
dim doubleClickTime, currentClickTicks as Integer

#if targetMacOS then
Declare Function GetDbtTime Lib "Carbon" () as Integer
doubleClickTime = GetDbtTime()
#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

5.0.161 How to make my Mac not sleeping?

Plugin Version: all, Platform: macOS.

Answer: Just inform the Mac OS about some system activity with code like this:

Example:

```

Sub UpdateSystemActivity()

#if TargetCarbon
declare function myUpdateSystemActivity lib "Carbon" alias "UpdateSystemActivity" (activity as Integer)
as short

const OverallAct = 0 // Delays idle sleep by small amount */
const UsrActivity = 1 // Delays idle sleep and dimming by timeout time */
const NetActivity = 2 // Delays idle sleep and power cycling by small amount */
const HDAActivity = 3 // Delays hard drive spindown and idle sleep by small amount */
const IdleActivity = 4 // Delays idle sleep by timeout time */

dim e as Integer

e=myUpdateSystemActivity(UsrActivity)

```

```
// you may react on an error if e is not 0 after the call.
```

```
#endif
End Sub
```

Notes: You may use another constant if you prefer some different behavior. Call it maybe every second.

5.0.162 How to make my own registration code scheme?

Plugin Version: all, Platform: Windows.

Answer: There are excellent articles about how to make a registration code scheme, but you can also simply use our RegistrationEngineMBS class.

Notes: If you need a license text, why not use the one from Xojo as a starting point?

5.0.163 How to make small controls on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```

'/*
** Use the control's default drawing variant. This does not apply to
** Scroll Bars, for which Normal is Large.
**/
const kControlSizeNormal = 0

'/*
** Use the control's small drawing variant. Currently supported by
** the Check Box, Combo Box, Radio Button, Scroll Bar, Slider and Tab
** controls.
**/
const kControlSizeSmall = 1

'/*
** Use the control's small drawing variant. Currently supported by
** the Indeterminate Progress Bar, Progress Bar and Round Button
** controls.
**/
const kControlSizeLarge = 2

```

```

'/*
' * Control drawing variant determined by the control's bounds. This
' * ControlSize is only available with Scroll Bars to support their
' * legacy behavior of drawing differently within different bounds.
' */
const kControlSizeAuto = &hFFFF

const kControlSizeTag = "size"

declare function SetControlData lib "Carbon" (controlhandle as Integer, part as short, tagname as OS-
Type, size as Integer, data as ptr) as short

dim m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))

```

5.0.164 How to mark my Mac app as background only?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSUIElement"" YES")

```

Notes: This will set the NSUIElement flag to YES.

5.0.165 How to move a file or folder to trash?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```

Function MoveToTrash(f as FolderItem) As Boolean
#If TargetMacOS then
dim r as FolderItem
dim e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFile-
OperationDefaultOptions)

```

```

if e = 0 then
Return true // Ok
end if

#elseif TargetWin32 then
dim w as new WindowsFileCopyMBS

dim flags as Integer = w.FileOperationAllowUndo + w.FileOperationNoErrorUI + w.FileOperationSilent
+ w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if

flags = w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if
#else
// Target not supported
break
Return false
#endif
End Function

```

Notes: If you want to move a file to trash, you could use `f.movefileto f.trashfolder`, but that will overwrite existing files in the trash. You can use our `MacFileOperationMBS` class to move a file on Mac to the trash. And it uses the same code as the Finder, so files are renamed when the same name is already in use in the trash:

On Windows we use `WindowsFileCopyMBS` class.
Requires Mac OS X 10.5.

5.0.166 How to move an application to the front using the creator code?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:

Example:

```

dim a as appleevent

a=newappleEvent("misc","actv","ttxt")

```

```
if a.send then
end if
```

Notes: (Code is Mac only)

5.0.167 How to move file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
dim d as CURLMBS // your curl object

// rename/move file
dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "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 RNTD with the new file name. To delete use DELE and the file path.

5.0.168 How to normalize string on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```
Function Normalize(t as string) As string
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS = NewCFStringMBS(t)
dim m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)
```

```
Return m.str  
End Function
```

Notes: This uses Apple's CFString functions to normalize unicode variants.

5.0.169 How to obscure the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ObscureCursor Lib "Carbon" ()
```

```
ObscureCursor
```

Notes: The MBS Plugin has this function, but it's not supported for Windows.

5.0.170 How to open icon file on Mac?

Plugin Version: all, Platform: macOS.

Answer: Use the NSImageMBS class like this:

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ico")  
dim n as new NSImageMBS(f)
```

```
window1.Backdrop = n.CopyPictureWithMask
```

5.0.171 How to open PDF in acrobat reader?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
dim pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
```

```

// open PDF in Acrobat Reader on Mac:

// find app
dim bundleID as string = "com.adobe.Reader"
dim app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")

if app<>nil then

// launch app with parameters

dim docs() as FolderItem
docs.Append pdf

dim param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

dim x as FolderItem = LaunchServicesOpenXMBS(docs, param)

// on failure, simply launch it
if x = nil then
pdf.Launch(true)
end if

else
pdf.Launch(true)
end if

```

Notes: On Windows, simply use pdf.launch or WindowsShellExecuteMBS.

5.0.172 How to open printer preferences on Mac?

Plugin Version: all, Platform: macOS.

Answer: You can use our OpenMacOSXPreferencesPaneMBS function like this:

Example:

```

dim e as Integer = OpenMacOSXPreferencesPaneMBS("PrintAndFax")
if 0 = e then
MsgBox "OK"
elseif e = -43 then
MsgBox "File not found."
else
MsgBox "Error: "+str(e)
end if

```

5.0.173 How to open special characters panel on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have functions for that in Cocoa and Carbon.

Example:

```
dim a as new NSApplicationMBS
a.orderFrontCharacterPalette
```

Notes: For Cocoa, you can use `orderFrontCharacterPalette` method in `NSApplicationMBS` class.

Or simply for Carbon and Cocoa the `ShowCharacterPaletteMBS` method.

5.0.174 How to optimize picture loading in Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the `WebPicture` class.

Notes: Take your picture and create a `WebPicture` object. Store this `WebPicture` in a property of the `WebPage`, `Session` or `app` (as global as possible). On the first time you use this picture on an user session, the browser will load it. Second time you use it, the browser will most likely pick it from the cache.

Having pictures in `App` or some module reuses the same picture for all sessions which reduces memory footprint.

This does not work well with pictures you change very often or use only for one webpage on one user.

If you like to see an example, check our `Map` example.

5.0.175 How to parse XML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
dim s as string = "<test><test /></test>"
```

```
try
```

```

dim x as new XmlDocument(s)
MsgBox "OK"
catch xe as XmlException
MsgBox "invalid XML"
end try

```

Notes: If you got an exception, you have a parse error.

5.0.176 How to play audio in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the HTML5 audio tag and control it with javascript.

Notes: This is just another example app I made today. It plays a christmas song. The audio file is provided by the application to the server, so no external web server is needed and this application can run stand alone. To compile and run you need Xojo 2010r5.

In the open event we search the audio files and open them as binarystreams. We create the two webfile objects. Those webfiles are part of the app class, so we have them globally. There we set the data with the content of our streams. We also define file names and mime types. They are needed so browser know what we have here:

```

audioFileM4V = new WebFile
audioFileM4V.Data = bM.Read(BM.Length)
audioFileM4V.Filename = "music.m4a"
audioFileM4V.MIMEType = "audio/m4a"

```

```

audioFileOGG = new WebFile
audioFileOGG.Data = bO.Read(BO.Length)
audioFileOGG.Filename = "music.ogg"
audioFileOGG.MIMEType = "audio/ogg"

```

Next in the open event of the webpage we have a PageSource control. The location is set to be before content. In the open event we define the html code for this. First we pick the URLs for the audio files. Than we build the html to use the audio tag. As you see, we give it an ID for later use and have it preload automatically. If you add an autoplay tag, you can have the audio play right away. Inside the audio tag we have two sources so we provide audio for both Firefox (OGG) and Safari (MPEG4). Finally we have a text to display if HTML5 audio tag is not supported.

You can set the source in the EditSource event:

```
dim urlO as string = app.audioFileOGG.URL
dim urlM as string = app.audioFileM4V.URL
me.Source = "<audio id=""mymusic"" preload=""auto""><source src="""+urlO+""" type=""audio/ogg""
/><source src="""+urlM+""" type=""audio/mpeg"" />Your browser does not support the audio ele-
ment.</audio>"
```

Next in the Play button we execute code to play the audio. This is a short javascript code which searches in the html document for the element with the ID "mymusic" which is the ID of our audio tag above. Once we got the object, we call it's play method to start playback.

```
me.ExecuteJavaScript("document.getElementById('mymusic').play();")
```

same for pause:

```
me.ExecuteJavaScript("document.getElementById('mymusic').pause();")
```

and finally for changing volume:

```
me.ExecuteJavaScript("document.getElementById('mymusic').volume="+str(me.Value/100.0)+";")
```

5.0.177 How to pretty print xml?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the XML Transform method with the right XLS.

Notes: Learn more here:

<http://docs.xojo.com/index.php/XMLDocument.Transform>

5.0.178 How to print to PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code below shows how to redirect printing to a PDF file on Mac OS X.

Example:

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString
```

```

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20

```

Notes: And you can use normal graphics class for that.

5.0.179 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Platform: macOS.

Answer: You can use a MDItemMBS object to query this value:

Example:

```

Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
#If TargetMacOS Then
Dim xMDItem as New MDItemMBS(F)
Dim xDate as Variant

If xMDItem <>Nil Then
xDate = xMDItem.GetAttribute(xMDItem.kMDItemLastUsedDate).DateValue
If xDate IsA Date Then Return xDate
Else
If xDate <>Nil Then Break
End If
#EndIf

If DefaultOtherDates Then
If F.ModificationDate <>Nil Then Return F.ModificationDate
If F.CreationDate <>Nil Then Return F.CreationDate
End If
End Function

```

Notes: Thanks for Josh Hoggan for this example code.

5.0.180 How to quit windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
dim i1,i2,r as Integer
declare function ExitWindowsEx lib "user32" (uFlags as Integer, dwReserved as Integer) as Integer
i1 = 2
i2 = 0
r = ExitWindowsEx(i1,i2)
if r<>0 then
' Error()
end if

#endif
```

Notes: uFlags parameters:

```
'4 = EWX_Force
'0 = EWX_Logoff
'2 = EWX_Reboot
'1 = EWX_shutdown, should shut down computer
```

Also check the ExitWindowsMBS method.

5.0.181 How to read a CSV file correctly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = f.OpenAsTextFile

while not t.EOF
dim s as string = t.ReadLine(encodings.ASCII)

dim items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")
```

```
List.AddRow """
dim u as Integer = UBound(items)
for i as Integer = 0 to u
List.Cell(List.LastIndex,i) = items(i)
next

wend
```

Notes: Please make sure you choose the right text encoding.

5.0.182 How to read the command line on windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

#endif
```

Notes: Newer Xojo versions have a system.commandline property.

5.0.183 How to render PDF pages with PDF Kit?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
// choose a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
dim sourceFile as New PDFDocumentMBS(f)
```

```

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
dim c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
dim page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
dim p as NSImageMBS = page.Render

// and convert to RB picture and display
Backdrop = p.CopyPictureWithMask

next

end if

```

Notes: PDFKit works only on Mac OS X.

5.0.184 How to restart a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```

dim ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if

```

5.0.185 How to resume ftp upload with curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: CURL supports that and you simply need to set the right options.

Notes: First of course OptionUpload must be true. Second OptionFTPAppend must be true so the OptionResumeFrom is used. Store there (or in OptionResumeFromLarge) your start value. Don't forget to implement the read event and return data there as requested.

5.0.186 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code opens a PDF and draws the first page into a new PDF with 90–∞ rotation.

Example:

```
// Rotate a PDF page

// our files
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90–∞
c.RotateCTM pi*1.5

// fix origin
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage
```

```
c = nil

// show in PDF viewer
destfile.Launch
```

Notes: This code is Mac only as it needs CoreGraphics.

5.0.187 How to rotate image with CoreImage?

Plugin Version: all, Platform: macOS.

Answer: Use the code like the one below:

Example:

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation

// as Xojo picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

5.0.188 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Install 32 bit compatibility libraries.

Notes: The package is called ia32-libs for ubuntu (and others).

Some applications need to be run on a 32 bit system as they need some hardware related libraries. Like libUSB or libHID for USB devices.

5.0.189 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Platform: macOS.

Answer: You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.

Example:

```
// make it landscape
dim n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
n.orientation = n.NSLandscapeOrientation

// save html to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call HTMLViewer1.PrintToPDFFileMBS(f,10,30,10,30)
```

Notes: You may want to reset options later.
This code is only for Mac OS X.

5.0.190 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to save to RTFD:

Example:

```
// save text as RTFD including image attachments
dim f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtfd, "test.rtf")

if f = nil then Return

dim a as NSAttributedStringMBS = textView.textStorage
dim w as 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 TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

5.0.191 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to load PDF to htmlviewer on desktop?

Example:

```

Public Sub LoadPDFData(viewer as HTMLViewer, PDFData as string)
Dim base64string As String = EncodeBase64(PDFData)

// remove line endings to make it a big line
base64string = ReplaceLineEndings(base64string, "")

// build data URL
// https://en.wikipedia.org/wiki/Data_URI_scheme
Dim dataURL As String = "data:application/pdf;base64," + base64string

// show in webviewer
HTMLViewer1.LoadURL(dataURL)

// may not work everywhere due to URL length limit
// for Web projects, use WebFile instead!
End Sub

```

Notes: This avoids a temporary file, which may also work.
For Web Apps, please use WebFile.

5.0.192 How to scale a picture proportionally with mask?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportionalScaledWithMask(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
dim m as picture = pic.mask(False)
pic.mask = nil

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

if m <>nil then
// restore mask and scale it
pic.mask = m
NewPic.mask.Graphics.DrawPicture m, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height
end if

// return result
Return NewPic
End Function

```

Notes: This version handles mask. As you see we actually have to remove mask in order to copy the picture part correctly.

5.0.193 How to scale a picture proportionally?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportionalScaled(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

```

```

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

// return result
Return NewPic
End Function

```

Notes: This does not handle mask, but you can scale the mask the same way and assign it to the new picture.
(see other FAQ entry with mask)

5.0.194 How to scale/resize a CIIImageMBS?

Plugin Version: all, Platform: Windows.

Answer: Use the CIFilterLanczosScaleTransform filter to scale down a picture to a specific size.

Example:

```

Dim pic As Picture = LogoMBS(500)
Dim image As CIIImageMBS = CIIImageMBS.imageWithPicture(pic)

Dim filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Dim scale As Double = targetHeight / image.Extent.Height
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim result As Picture = filter.outputImage.RenderPicture

Backdrop = result

```

Notes: This is same code as our scaleTo convenience method.

5.0.195 How to scale/resize a picture?

Plugin Version: all, Platform: Windows.

Answer: There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.

Example:

```
dim Original,Scaled as Picture
```

```
Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)
```

Notes: The plugin ways:

- GraphicsMagick can scale/resize.
- CoreImage scale filter may result in the fastest and best images on Mac OS X 10.4.
- NSImageMBS can scale, but is Mac OS X only.
- CGImageMBS can scale, but is Mac OS X only.
- CIImageMBS can scale, but is Mac OS X only.
- QuickTime Graphics exporter and importer can be connected to scale. (this was used more often a few years ago)
- ImageMagick can scale very nice and crossplatform. But the ImageMagick libraries are big.
- The picture.ScaleMBS function is self written and results in equal output on Mac, Windows and Linux without any additional libraries installed.
- Picture.ScalingMBS does crossplatform scaling with several modes.

with pure Xojo:

- make a new picture and draw the old one with new size inside.

5.0.196 How to search with regex and use unicode codepoints?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can specify unicode characters in search string with backslash x and digits.

Example:

```
dim r as RegExMbs
dim s as string
dim c as Integer
```

```

s="123 √√√° ABC 456"

r=new RegExMBS
if r.Compile("√") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

r=new RegExMBS
if r.Compile("\xF6") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

```

5.0.197 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```

Function Invisible(F As FolderItem) As Boolean
Dim TIS As TextInputStream
Dim S,All As String
Dim I as Integer
dim g as folderitem

If Left(F.Name,1)="." or not f.visible Then
Return True
End If

g=F.Parent.Child(".hidden")
If g.Exists Then
TIS=g.OpenAsTextFile
if tis<>Nil then
All=TIS.ReadAll
For I=1 to CountFields(All,Chr(11))
S=NthField(All, Chr(11), I)

```

```

If S=F.name Then
Return True
End If
Next
end if
End if
End Function

```

5.0.198 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You use the pragma cache_size command on the database.

Example:

```

// set cache size to 20000 pages which is about 20 MB for default page size
dim db as REALSQLDatabase
db.SQLExecute "PRAGMA cache_size = 20000"

```

Notes: Default cache size is 2000 pages which is not much.

You get best performance if whole database fits in memory.

At least you should try to have a cache big enough so you can do queries in memory.

You only need to call this pragma command once after you opened the database.

5.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

Answer: Try this declares:

Example:

```

window1.ModifiedMBS=true

```

5.0.200 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the

Example:

```

dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer

// load into html viewer
HTMLViewer1.URL = CurrentFile.URL

```

Notes: See our Create PDF example for the Xojo Web Edition.

5.0.201 How to show Keyboard Viewer programmatically?

Platform: macOS.

Answer: Use Xojo or AppleScript to launch the KeyboardViewerServer.app.

Example:

```

dim a as new AppleScriptMBS
dim text as string
dim lines(-1) as string

lines.append "set theApplication to ""KeyboardViewerServer""
lines.append "set thePath to ""/System/Library/Components/KeyboardViewer.component/Contents/Shared-
Support/KeyboardViewerServer.app""
lines.append ""
lines.append "set POSIXPath to ((POSIX file thePath) as string)"
lines.append "tell application ""System Events"" to set isRunning to 0 <(count (application processes whose
name is theApplication))"
lines.append "if isRunning then tell application POSIXPath to quit"
lines.append "delay 0.15"
lines.append ""
lines.append "ignoring application responses"
lines.append " tell application POSIXPath to run"
lines.append "end ignoring"

text=join(lines,EndOfLine.macintosh)

a.Compile text
a.Execute

```

Notes: AppleScript code:

```
set theApplication to "KeyboardViewerServer"
set thePath to "/System/Library/Components/KeyboardViewer.component/Contents/SharedSupport/KeyboardViewerServer.app"
```

```
set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theApplication))
if isRunning then tell application POSIXPath to quit
delay 0.15
```

```
ignoring application responses
tell application POSIXPath to run
end ignoring
```

5.0.202 How to show the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ShowCursor Lib "Carbon" ()
```

```
ShowCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

5.0.203 How to shutdown a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","shut","MACS")
if not ae.send then
msgBox "The computer couldn't be shutdown."
end if
```

Notes: Or toolbox call (Attention: This method will stop the computer immediatly: No document asked to be saved, all applications quitting without knowing).

```
Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower
```

5.0.204 How to sleep a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

5.0.205 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Here a few speed tips:

Notes:

- Use the DynaPDFRasterizerMBS function instead of our render functions.
- Reuse DynaPDFRasterizerMBS as long as the target picture size doesn't change.
- Import only the PDF pages you want to display.
- Let DynaPDF do zooming, rotating or other effects instead of you change it.

5.0.206 How to use PDFLib in my RB application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The PDFlib plugin was discontinued in favor of our DynaPDF plugin.

Notes: If you need help to move, please contact us.

5.0.207 How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Just double them.

Example:

```
msgbox "This String contains ""quotes"""
```

5.0.208 How to use Sybase in Web App?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use our MBS Xojo SQL Plugin to connect to a Sybase Database in your web application.

Notes: If you see db.Connect giving the error message "cs_ctx_alloc ->CS_MEM_ERROR", than some things are not setup right for Sybase.

The Apache process may not have all the SYBASE environment variables being set when the CGI was launched.

Adding these lines to /etc/httpd/conf/httpd.conf stopped the faux memory errors for us:

```
SetEnv LD_LIBRARY_PATH /opt/sybase/OCS-15_0/lib:/opt/sybase/OCS-15_0/lib3p64:/opt/sybase/OCS-15_0/lib3p:
SetEnv SYBROOT /opt/sybase
SetEnv SYBASE_OCS /opt/sybase
SetEnv SYBASE /opt/sybase
```

5.0.209 How to use the Application Support folder?

Plugin Version: all, Platform: macOS.

Answer:

I was saving a registration code for an app to the Preference folder. People on the list have suggested that it would be better in the ApplicationSupportFolder. How do I save the file called CWWPrefs into that folder using MBS?

I have checked for examples and the docs but can't see how to apply it

```
//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)
```

Example:

```

dim folder,file as FolderItem

folder = createApplicationSupportFolderMBS(-32763)

if folder=nil then
// Some very old Mac OS Versions may not support it
// or the plugin may fail for any reason
folder=SpecialFolder.Preferences
end if

file=folder.Child("CWWPrefs")

MsgBox file.NativePath

```

Notes:

You may not be able to write there with a normal user account!

5.0.210 How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Platform: macOS.

Answer: You can use the following code which does this using the SoftDeclareMBS class.

Example:

```

Sub Open()
dim c as CFDateMBS
dim t as CFAbsoluteTimeMBS

// get current date
c=NewCFDateMBS

// in absolute time (seconds since x)
t=c.AbsoluteTime

// add 600 seconds (= 10 Minutes)
t.Value=t.Value+600

// Make a Date from it
c=t.Date

// Schedule the event
// 0 on success
// E00002C1 for missing root rights

```

```

Title=hex(schedulePowerEvent(c, "wake"))

// Just for information, display the scheduled stuff
CFShowMBS CopyScheduledPowerEvents
End Sub

Function CopyScheduledPowerEvents() As carrayMBS
dim s as SoftDeclareMBS
dim m as MemoryBlock

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMCopyScheduledPowerEvents") then
if s.CallFunction(0,nil) then
Return NewCFArrayMBSHandle(s.Result,true)
else
MsgBox "Failed to Call IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOKit."
end if

Return nil
End Function

Function SchedulePowerEvent(time_to_wake as CFDateMBS, Type as CFStringMBS) as Integer
dim s as SoftDeclareMBS
dim m as MemoryBlock

'/*
'* Types of power event
'* These are potential arguments to IOPMSchedulePowerEvent().
'* These are all potential values of the kIOPMPowerEventTypeKey in the CFDictionaryes
'* returned by IOPMCopyScheduledPowerEvents().
'*/
'/*!
'@define kIOPMAutoWake
'@abstract Value for scheduled wake from sleep.
'*/
'#define kIOPMAutoWake "wake"
,
'/*!
'@define kIOPMAutoPowerOn
'@abstract Value for scheduled power on from off state.

```

```

*/
#define kIOPMAutoPowerOn "poweron"
,
/*!
#define kIOPMAutoWakeOrPowerOn
@abstract Value for scheduled wake from sleep, or power on. The system will either wake OR
power on, whichever is necessary.
*/
,
#define kIOPMAutoWakeOrPowerOn "wakepoweron"
/*!
#define kIOPMAutoSleep
@abstract Value for scheduled sleep.
*/
,
#define kIOPMAutoSleep "sleep"
/*!
#define kIOPMAutoShutdown
@abstract Value for scheduled shutdown.
*/
,
#define kIOPMAutoShutdown "shutdown"

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMSchedulePowerEvent") then

m=NewMemoryBlock(12)
m.Long(0)=time_to_wake.handle
m.Long(4)=0 // nil
m.Long(8)=type.Handle

if s.CallFunction(3,m) then
Return s.Result
end if
end if
end if

End Function

```

Notes: Requires Mac OS X and to execute root rights.

5.0.211 How to validate a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this function below which uses a regular expression to verify that the string is a valid UUID/GUID:

Example:

Function IsGUID(guid as string) As Boolean

dim r as new RegEx

```
r.SearchPattern = "^(\{ { 0,1 } ( [ 0-9a-fA-F ] ) { 8 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 12 } \} { 0,1 } )$ "
```

Return r.Search(guid)<>nil

End Function

Notes: Simply parsing the GUID with CFUUIDMBS does not give the same result as CFUUIDMBS will also take a string like "DDDD".

5.0.212 How to walk a folder hierarchie non recursively?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this one:

Example:

Sub Walk(folder as FolderItem)

dim folders() as FolderItem

folders.Append folder

while UBound(folders)>=0

dim currentFolder as FolderItem = folders.pop

dim c as Integer = currentFolder.Count

for i as Integer = 1 to c

dim item as FolderItem = currentFolder.TrueItem(i)

if item = Nil then

// no permission

elseif item.Visible then // only visible

if item.Directory then

folders.Append item

```
else
// work with file here
end if

end if

next

wend
End Sub
```

Notes: As you see we go with a long loop which runs until we don't have more folders to process. We ignore items we can't access due to permission limits. And we only work visible items. If you like, check `folderitem.isBundleMBS` on item to handle packages and applications better on Mac OS X.

5.0.213 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Platform: macOS.

Answer: The plugins MacOSX and MacOSXCF belong together. If you use one part, please also install the other part.

Notes: We splitted the plugin because the Xojo IDE on Windows crashed on compilation.

5.0.214 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There are two main reasons.

Notes: 1. you may use the plugin before registering them. This is often the case if you register in a window open event and use the plugin in a control open event.

On the console on Mac OS X or Windows, you may see a message like this "MBS Plugins were used by the application before the RegisterMBSPlugin function was called. Please fix this in your code!".

2. you may have mixed different plugin versions which are not compatible.

In this case you can see a message "Internal plugin registration error." on the console on Mac OS X. Newer plugins may show a message dialog reporting this. Older version simply think they are not registered.

If the installer just merges old and new applications, users may have libraries of older and newer plugin versions in the libs folder. If your application loads the wrong version, the registration fails.

If you use remote debugging, make sure you clear the temporary files there, too. Otherwise you may have old DLLs on your hard disc which may disturb your application.

You can run into issues if you use your registration code on different places of your app. Please register only once in app.open (or app Constructor). If you have several codes, simply call them one after the other.

Also check that you only call RegisterMBSPlugin with valid serial number. If you later call RegisterMBSPlugin with Demo like in example code above, you remove the license.

Next check if you can clear the Xojo caches and that helps. This includes the Xojo Scratch folder and the Plugins & Project caches. Simply locate those folders and delete them. For Windows look in hidden AppData folder in your user folder. For Mac, please check textasciitilde /Library/Caches and your temp folders.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

5.0.215 I want to accept Drag & Drop from iTunes

Plugin Version: all, Platform: macOS.

Answer: You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.

Example:

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub
```

```
Sub DropObject(obj As DragItem)
dim s as string
dim f as folderItem
dim d as CFDictionaryMBS
dim o as CFObjectMBS
dim key as CFStringMBS
dim dl as CFDictionaryListMBS
dim i,c as Integer
dim u as CFURLMBS
dim file as FolderItem
```

```
if obj.MacDataAvailable("itun") then
s = obj.MacData("itun")
```

```
// Parse XML
o=NewCFOBJECTMBSFromXML(NewCFBinaryDataMBSStr(s))

// Make dictionary
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

// get Tracks Dictionary
key=NewCFStringMBS("Tracks")
o=d.Value(key)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
dl=d.List

// Walk over all entries in the Tracks dictionary
c=dl.Count-1
for i=0 to c
o=dl.Value(i)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

key=NewCFStringMBS("Location")
o=d.Value(key)
if o isa CFStringMBS then
u=NewCFURLMBS CFStringMBS(o),nil

file=u.file
if file<>nil then
MsgBox file.NativePath
end if
end if
end if
next
end if
end if
end if
End Sub
```

Notes: The code above inside a window on Xojo 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

5.0.216 I'm drawing into a listbox but don't see something.

Plugin Version: all.

Answer: If you draw this in a listbox cellbackground, you need to draw on the correct position

Example:

```
Function CellBackgroundPaint(g As Graphics, row as Integer, column as Integer) As Boolean
dim f as FolderItem
f=SpecialFolder.Desktop
f.DrawWideIconMBS(g,listbox1.left,listbox1.top+row*20,16)
Return true
End Function
```

Notes: Try this in a listbox. The Graphics object there has a clipping and an offset which the plugin doesn't know about.

5.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Platform: macOS.

Answer:

The code I produced in RB isn't smooth enough. Is there a call in MBS, if not, can it be done? The speed of it has to be like the show of a DrawerWindow.

Try the declare below for Carbon. With WindowLib it will work on Mac OS 8.5 and newer.

Notes:

See Window.Transition functions.

5.0.218 If I use one of your plug-ins under windows, would this then impose the use of dll after compilation or my would my compiled soft still be a stand-alone single file software?

Platforms: macOS, Linux, Windows.

Answer: Stand alone.

Notes: Xojo compiles all used plugins into the application binary.

Some plugin parts need external dlls but you will find that in the documentation. (e.g. pdfib for some classes)

5.0.219 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Platform: macOS.

Answer: I am unable to figure out how or if it is possible to detect if the fn key is down on a powerbook keyboard. Is it possible?

Example:

' Window.Open Event of a blank project:

```
dim i as Integer

for i=0 to 127
if keyboard.asynckeydown(i) then
title=str(i) // found
return
end if
next
title="" // not found
```

Notes: This test application shows the keycode (decimal) 63 for the fn key.

5.0.220 Is there a case sensitive Dictionary?

Plugin Version: all.

Answer: The MBS Plugin has several classes which can work as a replacement.

Notes: First you could use VariantToVariantHashMapMBS or VariantToVariantOrderedMapMBS.

If you know that all keys are Strings or Integers only, you can use the specialized classes which are a little bit faster due to avoiding variants:

```
IntegerToIntegerHashMapMBS class
IntegerToIntegerOrderedMapMBS class
IntegerToStringHashMapMBS class
IntegerToStringOrderedMapMBS class
IntegerToVariantHashMapMBS class
IntegerToVariantOrderedMapMBS class
StringToStringHashMapMBS class
StringToStringOrderedMapMBS class
StringToVariantHashMapMBS class
StringToVariantOrderedMapMBS class
```

5.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the DirectorySizeMBS class for this as in the example below:

Example:

```
dim d as DirectorySizeMBS

d=new DirectorySizeMBS

// volume(1) as my boot volume is very full
if d.update(volume(1),true,0) then
MsgBox str(d.VisibleItemCount)+" visible items, "+str(d.HiddenItemCount)+" invisible items."
end if
```

Notes: Complete Question: Is there a way to use the MBS plugin to get only the visible item and folder count on a volume? The FileCount and FolderCount properties of VolumeInformationMBS seem to provide the total # of items including invisible items such as .DS_Store and more importantly .Trashes which is causing me a great amount of difficulty during a recursive scan of a volume. I've got a progress bar which uses the total of the filecount and foldercount properties as the maximum value, but my routine needs to filter out all invisible items, as it is creating a catalog of a volume for archiving purposes. Any thoughts how I could get accurate number.

5.0.222 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Platform: macOS.

Answer: Use the code below:

Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

5.0.223 List of Windows Error codes?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have a list of windows error codes on our website.

Notes: <http://www.monkeybreadsoftware.de/xojo/winerror.shtml>

5.0.224 Midi latency on Windows problem?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The issue is system related, not a problem with RB or the plugin.

Notes: Two things will adversely affect the timing:

(1) latency of the software synthesizer output driver. The default Windows wavetable synthesizer has considerable latency. I don't know how many milliseconds, but it is noticeable.

(2) latency of the digital audio output driver. Different systems have different drivers for different audio hardware. My Dell laptop has a minimum 15ms latency in the audio driver.

These two things put together were causing a very sluggish MIDI response. I was able to verify these as the culprits by routing MIDI directly out of RB into a sample player, which only introduces the latency of (2) and does not include latency of (1).

I don't know how widely known are these facts, if not then you may want to add this information to the documentation, since Windows programmers using the MIDI plugin may not know those problems, and might mistakenly blame your plugin, as I did :) Sorry about that!

(From Aaron Andrew Hunt)

5.0.225 My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

Answer: Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:

Notes: Just a list of checks to do for linux apache installations:

- You have 64bit linux? 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?

5.0.226 SQLiteDatabase not initialized error?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Before you can use SQLiteDatabaseMBS, it must be initialized.

Example:

```
dim d as new SQLiteDatabaseMBS
```

Notes: This happens normally when you use "new SQLiteDatabaseMBS".

But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happened, yet.

So please simply add a line "dim d as new SQLiteDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

5.0.227 Textconverter returns only the first x characters. Why?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Some older Xojo versions limit the Textconverter to around 1024 characters in input and output. This should be fixed with RB5.

Notes:

Xojo seems not to support Textconverters at all on Windows.

5.0.228 The type translation between CoreFoundation/Foundation and Xojo data types.

Plugin Version: all, Platform: macOS.

Answer: The plugin does conversion between Cocoa/Carbon data types and native Xojo data types. The following list help you knowing what the current plugins support:

Notes: Cocoa NSObject to Variant:

```

nil ->nil
NSDictionary ->Dictionary
NSData ->MemoryBlock
NSString ->String
NSAttributedString ->NSAttributedStringMBS
NSDate ->Date
NSNumber ->double/integer/Int64/UInt64/UInt32/Boolean
NSURL ->String
NSValue with NSRect ->NSRectMBS
NSValue with NSPoint ->NSPointMBS
NSValue with NSSize ->NSSizeMBS
NSValue with NSRange ->NSRangeMBS
NSValue with QTTime ->QTTimeMBS
NSValue with QTTimeRange ->QTTimeRangeMBS
NSArray ->Array of Variant
QuartzFilter ->QuartzFilterMBS

```

- ->*MBS

Variant to Cocoa NSObject:

```

nil ->nil
Dictionary ->NSDictionary
Boolean ->NSNumber
Integer ->NSNumber
Color ->NSColor
Int64 ->NSNumber
Single ->NSNumber
Double ->NSNumber
Date ->NSDate
MemoryBlock ->NSData
String ->NSString
NSImageMBS ->NSImage
NSAttributedStringMBS ->NSAttributedString
NSColorMBS ->NSColor
NSRectMBS ->NSValue with NSRect
NSSizeMBS ->NSValue with NSSize

```

NSPointMBS ->NSValue with NSPoint
 NSRangeMBS ->NSValue with NSRange
 NSBurnMBS ->NSBurn
 NSViewMBS ->NSView
 NSFontMBS ->NSFont
 NSParagraphStyleMBS ->NSParagraphStyle
 NSAttributedStringMBS ->NSAttributedString
 WebPolicyDelegateMBS ->WebPolicyDelegate
 WebUIDelegateMBS ->WebUIDelegate
 WebFrameLoadDelegateMBS ->WebFrameLoadDelegate
 WebResourceLoadDelegateMBS ->WebResourceLoadDelegate
 NSIndexSetMBS ->NSIndexSet
 QTTimeMBS ->QTTime
 QTTimeRangeMBS ->QTTimeRange
 Array of Variant ->NSArray
 Array of String ->NSArray
 CFStringMBS ->NSString
 CFNumberMBS ->NSNumber
 CFDataMBS ->NSData
 CFURLMBS ->NSURL
 CFArrayMBS ->NSArray
 CFDictionaryMBS ->NSDictionary
 CFBinaryDataMBS ->NSData

Carbon CTypeRef to Variant:

CFDictionaryRef ->Dictionary
 CFStringRef ->String
 CFDataRef ->String
 CFURL ->String
 CFNumber ->Integer/Double/Int64
 CFArray ->Array
 CFDate ->date
 nil ->nil
 CGColorSpace ->CGColorSpaceMBS
 CGColor ->CGColorMBS
 CGImage ->CGImageMBS
 CF* ->CF*MBS

Variant to Carbon CTypeRef:

Dictionary ->CFDictionaryRef
 Boolean ->CFBooleanRef
 Color ->CFNumberRef
 Integer ->CFNumberRef

Int64 ->CFNumberRef
 Single ->CFNumberRef
 Double ->CFNumberRef
 String ->CFStringRef
 Color ->CGColorRef
 Date ->CFDateRef
 nil ->nil
 Memoryblock ->CFDataRef
 FolderItem ->CFURLRef
 Dictionary ->CFDictionaryRef
 Array of Variant/String/Date/Double/Single/Int64/Integer ->CFArray
 CGRectMBS ->CGRect as CFDataRef
 CGSizeMBS ->CGSize as CFDataRef
 CGPointMBS ->CGPoint as CFDataRef
 CGColorMBS ->CGColor
 CGColorSpaceMBS ->CGColorSpace
 CGImageMBS ->CGImage
 CGDataConsumerMBS ->CGDataConsumer
 CGDataProviderMBS ->CGDataProvider
 CF*MBS ->CF*

Strings without encodings should be put into dictionaries as memoryblocks.

5.0.229 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Platform: Windows.

Answer: If you see errors like a simple "Segmentation Fault" on Linux or some other wired errors, you may want to check your FTP upload mode. It must be binary for web apps. ASCII mode corrupts the application.

5.0.230 What classes to use for hotkeys?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.

Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

5.0.231 What do I need for Linux to get picture functions working?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In order to get our plugins working on Linux systems without GUI, the plugin loads graphics

libraries dynamically.

Notes: To get it working, the plugin tries to load gtk with this paths:

- libgtk-x11-2.0.so”
- libgtk-x11-2.0.so.0”
- /usr/lib/libgtk-x11-2.0.so”
- /usr/lib32/libgtk-x11-2.0.so”
- /usr/lib/libgtk-x11-2.0.so.0”
- /usr/lib32/libgtk-x11-2.0.so.0”

gdk is loaded with this paths:

- libgdk-x11-2.0.so”
- libgdk-x11-2.0.so.0”
- /usr/lib/libgdk-x11-2.0.so”
- /usr/lib32/libgdk-x11-2.0.so”
- /usr/lib/libgdk-x11-2.0.so.0”
- /usr/lib32/libgdk-x11-2.0.so.0”

For the paths without explicit path, the system will search in /lib, /usr/lib and all directories in the LD_LIBRARY_PATH environment variable.

5.0.232 What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

5.0.233 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Platform: macOS.

Answer:

Xojo 4.5 has a constant "SmallSystem" to use for a font name.

For older versions try this code:

Example:

```

Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef
fontName as Integer)
dim err as Integer
dim theFont, theFontSize, theFontStyle as MemoryBlock

const smSystemScript = -1

Declare Function GetThemeFont Lib "Carbon" (inFontID as Integer, inScript as Integer, outFontName
as Ptr, outFontSize as Ptr, outStyle as Ptr) as Integer

theFont = NewMemoryBlock(256) //Str255
theFontSize = NewMemoryBlock(2) //SInt16
theFontStyle = NewMemoryBlock(1) //Style

err = GetThemeFont(fontType, smSystemScript, theFont, theFontSize, theFontStyle)

if err = 0 then
fontName = theFont.PString(0)
fontSize = theFontSize.UShort(0)
fontStyle = theFontStyle.Byte(0)
else
fontName = ""
fontSize = 0
fontStyle = 0
end if
End Sub

```

5.0.234 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Platform: Windows.

Answer: Last Version with 10.4 support is version 15.4.

Notes: With version 15.4 you can build applications for OS X 10.4 and newer.

For Version 16.0 we disabled 10.4 and moved minimum to 10.5. We may be able to enable it again to build a version of 16.x, but may need to charge for this by hour.

5.0.235 What is last plugin version to run on PPC?

Plugin Version: all, Platform: Windows.

Answer: Last Version with PPC is 15.4.

Notes: With version 15.4 you can build PPC applications for OS X 10.4 and newer.

For Version 16.0 we disabled PPC. We may be able to enable it again to build a PPC version of 16.x, but may need to charge for this by hour.

5.0.236 What is last version of the plugins for macOS 32-bit?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use version 23.0 or older.

Notes: We stopped including 32-bit code for macOS in version 23.1.

Please use older versions if you use an old Xojo.

Xojo 2017r3 and newer load our 64-bit plugins.

5.0.237 What is the difference between Timer and WebTimer?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Timer is server side and WebTimer client side.

Notes: Timer is the normal timer class in Xojo. It runs on the server. On the 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.

5.0.238 What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

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, CHIINV, CHITEST, CHOOSE, CLEAN, CODE, COLUMN, COLUMNS, COMBIN, CONCATENATE, CONFIDENCE, CORREL, COS, COSH, COUNT, COUNTA, COUNTBLANK, COUNTIF, COVAR, CREATE.OBJECT, CRITBINOM, CUSTOM.REPEAT, CUSTOM.UNDO, DATE, DATEDIF, DATESTRING, DATEVALUE, DAVERAGE, DAY, DAYS360, DB, DBCS, DCOUNT, DCOUNTA, DDB, DEGREES, DELETE.BAR, DELETE.COMMAND, DELETE.MENU, DELETE.TOOLBAR, DEREf, DEVSQ, DGET, DIALOG.BOX, DIRECTORY, DMAX, DMIN, DOCUMENTS, DOLLAR, DPRODUCT, DSTDEV, DSTDEVP, DSUM, DVAR, DVARP, ECHO, ELSE, ELSE.IF, ENABLE.COMMAND, ENABLE.TOOL, END.IF, ERROR, ERROR.TYPE, EVALUATE, EVEN, EXACT, EXEC, EXECUTE, EXP, EXPONDIST, FACT, FALSE, FCLOSE, FDIST, FILES, FIND, FINDB, FINV, FISHER, FISHERINV, FIXED, FLOOR, FOPEN, FOR, FOR.CELL, FORECAST,

FORMULA.CONVERT, FPOS, FREAD, FREADLN, FREQUENCY, FSIZE, FTEST, FV, FWRITE, FWRITELN, GAMMADIST, GAMMAINV, GAMMALN, GEOMEAN, GET.BAR, GET.CELL, GET.CHART.ITEM, GET.DEF, GET.DOCUMENT, GET.FORMULA, GET.LINK.INFO, GET.MOVIE, GET.NAME, GET.NOTE, GET.OBJECT, GET.PIVOT.FIELD, GET.PIVOT.ITEM, GET.PIVOT.TABLE, GET.TOOL, GET.TOOLBAR, GET.WINDOW, GET.WORKBOOK, GET.WORKSPACE, GETPIVOTDATA, GOTO, GROUP, GROWTH, HALT, HARMEAN, HELP, HLOOKUP, HOUR, HYPERLINK, HYPGEOMDIST, IF, INDEX, INDIRECT, INFO, INITIATE, INPUT, INT, INTERCEPT, IPMT, IRR, ISBLANK, ISERR, ISERROR, ISLOGICAL, ISNA, ISNONTEXT, ISNUMBER, ISPMT, ISREF, ISTEXT, ISTHAIDIGIT, KURT, LARGE, LAST.ERROR, LEFT, LEFTB, LEN, LENB, LINEST, LINKS, LN, LOG, LOG10, LOGEST, LOGINV, LOGNORMDIST, LOOKUP, LOWER, MATCH, MAX, MAXA, MDETERM, MEDIAN, MID, MIDB, MIN, MINA, MINUTE, MINVERSE, MIRR, MMULT, MOD, MODE, MONTH, MOVIE.COMMAND, N, NA, NAMES, NEGBINOMDIST, NEXT, NORMDIST, NORMINV, NORMSDIST, NORMSINV, NOT, NOTE, NOW, NPER, NPV, NUMBERSTRING, ODD, OFFSET, OPEN.DIALOG, OPTIONS.LISTS.GET, OR, PAUSE, PEARSON, PERCENTILE, PERCENTRANK, PERMUT, PHONETIC, PI, PIVOT.ADD.DATA, PMT, POISSON, POKE, POWER, PPMT, PRESS.TOOL, PROB, PRODUCT, PROPER, PV, QUARTILE, RADIANS, RAND, RANK, RATE, REFTTEXT, REGISTER, REGISTER.ID, RELREF, RENAME.COMMAND, REPLACE, REPLACEB, REPT, REQUEST, RESET.TOOLBAR, RESTART, RESULT, RESUME, RETURN, RIGHT, RIGHTB, ROMAN, ROUND, ROUNDBAHTDOWN, ROUNDBAHTUP, ROUNDDOWN, ROUNDUP, ROW, ROWS, RSQ, RTD, SAVE.DIALOG, SAVE.TOOLBAR, SCENARIO.GET, SEARCH, SEARCHB, SECOND, SELECTION, SERIES, SET.NAME, SET.VALUE, SHOW.BAR, SIGN, SIN, SINH, SKEW, SLN, SLOPE, SMALL, SPELLING.CHECK, SQRT, STANDARDIZE, STDEV, STDEVA, STDEVP, STDEVPA, STEP, STEYX, SUBSTITUTE, SUBTOTAL, SUM, SUMIF, SUMPRODUCT, SUMSQ, SUMX2MY2, SUMX2PY2, SUMXMY2, SYD, T, TAN, TANH, TDIST, TERMINATE, TEXT, TEXT.BOX, TEXTREF, THAIDAYOFWEEK, THAIDIGIT, THAIMONTHOFYEAR, THAINUMSOUND, THAINUMSTRING, THAISTRINGLENGTH, THAIYEAR, TIME, TIMEVALUE, TINV, TODAY, TRANSPOSE, TREND, TRIM, TRIMMEAN, TRUE, TRUNC, TTEST, TYPE, UNREGISTER, UPPER, USDOLLAR, USERDEFINED, VALUE, VAR, VARA, VARP, VARPA, VDB, VIEW.GET, VLOOKUP, VOLATILE, WEEKDAY, WEIBULL, WHILE, WINDOW.TITLE, WINDOWS, YEAR and ZTEST.

5.0.239 What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

Answer: Use the SoftDeclareMBS class to load libraries dynamically.

5.0.240 What to do on Xojo reporting a conflict?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

Xojo just wants to tell you that you dropped something in the plugins folder what is not a plugin.

Notes:

Some users dropped the examples, the documentation or other files into the plugins folder. Don't do it.

5.0.241 What to do with a `NSImageCacheException`?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You need to add exception handlers for `NSExcptionMBS` in order to catch this exception.

Notes: You may also add code to write the stack of the exception into a log file for later locating the error source.

A `NSImage` has several image representations in memory. So 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.

5.0.242 What to do with MySQL Error 2014?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can get this error on MySQL if you have a recordset open while you create another one.

5.0.243 What to do with SQL Plugin reporting Malformed string as error?

Plugin Version: all, Platform: macOS.

Answer: Please make sure the table and/or database fields have a text encoding set.

Notes: For Firebird our plugin tries to use UTF-8 encoding if possible and to correctly convert between various tables, the tables and their fields need to have a text encoding defined.

e.g. if the text field in the table is windows-1252 and the other ISO 8859-5, then the Firebird database can convert them to UTF-8 and deliver texts to the plugin.

If encoding is set to none, it may get confused for non-ascii text.

5.0.244 Where is `CGGetActiveDisplayListMBS`?

Plugin Version: all, Platform: Windows.

Answer: This is now `CGDisplayMBS.GetActiveDisplayList`.

5.0.245 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithPoint.

5.0.246 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithRect.

5.0.247 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetOnlineDisplayList.

5.0.248 Where is GetObjectClassNameMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use this replacement method:

Example:

```
Function GetObjectClassNameMBS(o as Object) As string
dim t as Introspection.TypeInfo = Introspection.GetType(o)
Return t.FullName
End Function
```

Notes: GetObjectClassNameMBS was removed from the plugins.

5.0.249 Where is NetworkAvailableMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We removed NetworkAvailableMBS some versions ago. It was not working right and basically it's not useful. If you want to check whether you have a network, than do a DNS resolve:

Example:

```

// two independent domain names
const domain1 = "www.google.com"
const domain2 = "www.macs.w.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.

5.0.250 Where is StringHeight function in DynaPDF?

Plugin Version: all, Platform: Windows.

Answer: Use the function GetFTextHeight or GetFTextHeightEx.

Notes: Be aware that GetFTextHeight works with format commands and you may want to escape your text if you don't use them.

5.0.251 Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

Answer: This class has been removed in favor of XLBookMBS class.

Notes: These classes have been removed: XLCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

5.0.252 Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Please visit this web page:

<http://www.wotsit.org>

5.0.253 Where to register creator code for my application?

Plugin Version: all, Platform: macOS.

Answer:

Register at Apple:

<http://developer.apple.com/dev/cftype/information.html>

5.0.254 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some frameworks from Mac OS X do not support 32 bit applications, so we can't provide plugins for Xojo until 64bit target is available.

Notes: For Mac OS X 10.8:

- Accounts
- EventKit
- GLKit
- Social

and in 10.9:

- Accounts
- AVKit
- EventKit
- GameController
- GLKit
- MapKit
- MediaLibrary
- Social
- SpriteKit

In general Apple makes all new frameworks being 64 bit only.

5.0.255 Which plugins are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some of our plugins work only in 64 bit modes as operation systems do not provide 32 bit code.

Notes: This effects currently: EventKit, Accounts, Social frameworks from Apple and our matching plugins.

5.0.256 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install DirectX from Microsoft on your Windows.

5.0.257 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install the Internet Explorer from Microsoft on your Windows.

Notes: This bug is for several older Windows 95 editions.

5.0.258 Why do I hear a beep on keydown?

Plugin Version: all, Platform: Windows.

Answer: When the user presses a key, RB goes through all keydown event handlers till on returns true.

Notes: If no keydown event handler returns true for the key, a beep is performed.

5.0.259 Why does folderitem.item return nil?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Because Xojo fails to make a folderitem for you. Reason may be an alias file which can't be resolved or simply that you don't have enough access rights to read the folder content.

Notes: A more rarely reason is that the directory changed and the file with the given index or name does no longer exist.

5.0.260 Why doesn't showurl work?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

There are three main reasons:

1. showurl is not supported by Xojo in 68k applications.
2. there is now application defined for the protocol (e.g. http) in the Internet Control panel.
3. You don't have Internet Config installed.

You can use the InternetConfigMBS class to check for this stuff.

5.0.261 Why don't the picture functions not work on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please make sure libcairo is installed.

Notes: For accessing pictures on Linux, the MBS Plugin relays on the cairo library.

Please install the package if you don't have it already.

Our plugin looks for library called libcairo.so or libcairo.so.2.

5.0.262 Why have I no values in my chart?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You have no data points visible, there may be several reasons:

Notes: For example one of the data values may be infinite or invalid.

Or the scaling may be out of range, so you simply see nothing.

5.0.263 Will application size increase with using plugins?

Plugin Version: all, Platform: Windows.

Answer: All plugins used by your application will be included in the application.

Notes: If you use no plugins, your application will not change size.

And if you use one class from the plugins, your application size will increase by a few kilobytes.

The documentation of the plugins include a list of all plugin parts and their sizes for the different platforms.

5.0.264 XLS: Custom format string guidelines

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. Four sections example:

```
#,###.00_); [ Red ] (,###.00);0.00;"sales "@
```

The following table describes the different symbols that are available for use in custom number formats.

Specify colors

To set the text color for a section of the format, type the name of one of the following eight colors in square brackets in the section. The color code must be the first item in the section.

Instead of using the name of the color, the color index can be used, like this [Color3] for Red. Valid numeric indexes for color range from 1 to 56, which reference by index to the legacy color palette.

Specify conditions

To set number formats that will be applied only if a number meets a specified condition, enclose the condition in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; >Greater than; <Less than; >= Greater than or equal to, <= Less than or equal to, and <>Not equal to. For example, the following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.

```
[ Red ] [ <=100 ] ; [ Blue ] [ >100 ]
```

If the cell value does not meet any of the criteria, then pound signs ("##") are displayed across the width of the cell.

Dates and times

Examples

5.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

Answer: Please upgrade your Windows version.

5.0.266 Xojo or my RB application itself crashes on launch on Mac OS Classic.
Why?

Plugin Version: all.

Answer:

You may check if the application has enough memory to be loaded.

RB should have on Mac OS Classic more than 20 MB of RAM.

I preferred to use 50 MB and for an application a 10 MB partition is a good way to start.

Parameter	Description
x	The x value of the data point. For an enumerated x-axis (see <code>Axis.setLabels</code> on what is an enumerated axis), the first data point is 0, and the nth data point is (n-1).
xLabel	The bottom x-axis label of the data point.
x2Label	The top x-axis label of the data point.
value	The value of the data point.
accValue	The sum of values of all data points that are in the same x position and same data group as the current data point, and with data set number less than or equal to the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
totalValue	The sum of values of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
percent	The percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
accPercent	The accumulated percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
gpercent	The percentage of the data point based on the total value of all data points in a layer.
dataSet	The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1).
dataSetName	The name of the data set to which the data point belongs.
dataItem	The data point number within the data set. The first data point is 0. The nth data point is (n-1).
dataGroup	The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1).
dataGroupName	The name of the data group to which the data point belongs.
layerId	The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1).
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using <code>Layer.addExtraField</code> , <code>Layer.addExtraField2</code> , <code>BaseChart.addExtraField</code> or <code>BaseChart.addExtraField2</code> .

diFieldN	Same as fieldN. See above.
dsFieldN	Similar to fieldN, except that dsFieldN means the extra field is indexed by data set number. The Pth data set corresponds to the Pth element of the extra field.
dsdiFieldN	Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth data set corresponds to the Pth element of the (N + Q)th extra field.

Parameter	Description
zx	The symbol scale in the x dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .
zy	The symbol scale in the y dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .
z	The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .

Parameter	Description
slope	The slope of the trend line.
intercept	The y-intercept of the trend line.
corr	The correlation coefficient in linear regression analysis.
stderr	The standard error in linear regression analysis.

Parameter	Description
top	The value of the top edge of the box-whisker symbol.
bottom	The value of the bottom edge of the box-whisker symbol.
max	The value of the maximum mark of the box-whisker symbol.
min	The value of the minimum mark of the box-whisker symbol.
med	The value of the median mark of the box-whisker symbol.

Parameter	Description
high	The high value.
low	The low value.
open	The open value.
close	The close value.

Parameter	Description
dir	The direction of the vector.
len	The length of the vector.

Parameter	Description
radius	The radial value of the data point.
value	Same as { radius } . See above.
angle	The angular value of the data point.
x	Same as { angle } . See above.
label	The angular label of the data point.
xLabel	Same as { label } . See above.
name	The name of the layer to which the data point belongs.
dataSetName	Same as { name } . See above.
i	The data point number. The first data point is 0. The nth data point is (n-1).
dataItem	Same as { i } . See above.
z	The symbol scale. Applicable for layers with symbol scales set by Polar-Layer.setSymbolScale.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2.
diFieldN	Same as fieldN. See above.
dsFieldN	Similar to fieldN, except that dsFieldN means the extra field is indexed by layer index. The Pth layer corresponds to the Pth element of the extra field.
dsdiFieldN	Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth layer corresponds to the Pth element of the (N + Q)th extra field.
Parameter	Description
dir	The direction of the vector.
len	The length of the vector.
Parameter	Description
value	The axis value at the tick position.
label	The axis label at the tick position.
Parameter	Description
[param]	The name of the parameter
[a]	If this field a number, it specifies the number of decimal places (digits to the right of the decimal point).

[b]	The thousand separator. Should be a non-alphanumeric character (not 0-9, A-Z, a-z). Use ' '.
textasciitilde ' for no thousand separator. The default is ' '.	
textasciitilde ', which can be modified using BaseChart.setNumberFormat.	
[c]	The decimal point character. The default is '.', which can be modified using BaseChart.setNumberFormat.
[d]	The negative sign character. Use ' '.
textasciitilde ' for no negative sign character. The default is '-', which can be modified using BaseChart.setNumberFormat.	

Parameter	Description
yyyy	The year in 4 digits (e.g. 2002)
yyy	The year showing only the least significant 3 digits (e.g. 002 for the year 2002)
yy	The year showing only the least significant 2 digits (e.g. 02 for the year 2002)
y	The year showing only the least significant 1 digits (e.g. 2 for the year 2002)
mmm	The month formatted as its name. The default is to use the first 3 characters of the english month name (Jan, Feb, Mar ...). The names can be configured using BaseChart.setMonthNames.
mm	The month formatted as 2 digits from 01 - 12, adding leading zero if necessary.
m	The month formatted using the minimum number of digits from 1 - 12.
MMM	The first 3 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
MM	The first 2 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
M	The first character of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
dd	The day of month formatted as 2 digits from 01 - 31, adding leading zero if necessary.
d	The day of month formatted using the minimum number of digits from 1 - 31.
w	The name of the day of week. The default is to use the first 3 characters of the english day of week name (Sun, Mon, Tue ...). The names can be configured using BaseChart.setWeekDayNames.
hh	The hour of day formatted as 2 digits, adding leading zero if necessary. The 2 digits will be 00 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
h	The hour of day formatted using the minimum number of digits. The digits will be 0 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
nn	The minute formatted as 2 digits from 00 - 59, adding leading zero if necessary.
n	The minute formatted using the minimum number of digits from 00 - 59.
ss	The second formatted as 2 digits from 00 - 59, adding leading zero if necessary.
s	The second formatted using the minimum number of digits from 00 - 59.
a	Display either 'am' or 'pm', depending on whether the time is in the morning or afternoon. The text 'am' and 'pm' can be modified using BaseChart.setAMPM.

Shape Id	Value	Description
SquareShape	1	Square shape. See (1, 1) above.
DiamondShape	2	Diamond shape. See (2, 1) above.
TriangleShape	3	Triangle shape pointing upwards. See (3, 1) above.
RightTriangleShape	4	Triangle shape pointing rightwards. See (4, 1) above.
LeftTriangleShape	5	Triangle shape pointing leftwards. See (5, 1) above.
InvertedTriangleShape	6	Triangle shape pointing downwards. See (1, 2) above.
CircleShape	7	Circle shape. See (2, 2) above.
StarShape	[Method]	Star shapes of various points. See (2, 3), (2, 4), (2, 5), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5) above for stars with 3 to 10 points.
PolygonShape	[Method]	Polygon shapes symmetrical about a vertical axis with a vertex at the top center position. See (4, 1), (4, 3), (4, 5), (5, 1) for polygons of 5 to 8 sides.
Polygon2Shape	[Method]	Polygon shapes symmetrical about a vertical axis but without any vertex at the top center position. See (4, 2), (4, 4) for polygons of 5 and 6 sides.
CrossShape	[Method]	'+' shapes. See (5, 2), (5, 3), (5, 4), (5, 5), (6, 1), (6, 2), (6, 3) for '+' shape with arm width of 0.1 - 0.7.
Cross2Shape	[Method]	'X' shapes. See (6, 4), (6, 5), (7, 1), (7, 2), (7, 3), (7, 4), (7, 5) for 'X' shapes with arm width of 0.1 - 0.7.

langEnglish	0	Roman script
langFrench	1	Roman script
langGerman	2	Roman script
langItalian	3	Roman script
langDutch	4	Roman script
langSwedish	5	Roman script
langSpanish	6	Roman script
langDanish	7	Roman script
langPortuguese	8	Roman script
langNorwegian	9	Roman script
langHebrew	10	Hebrew script
langJapanese	11	Japanese script
langArabic	12	Arabic script
langFinnish	13	Roman script
langGreek	14	Greek script using smRoman script code
langIcelandic	15	modified smRoman/Icelandic script
langMaltese	16	Roman script
langTurkish	17	modified smRoman/Turkish script
langCroatian	18	modified smRoman/Croatian script
langTradChinese	19	Chinese (Mandarin) in traditional characters
langUrdu	20	Arabic script
langHindi	21	Devanagari script
langThai	22	Thai script
langKorean	23	Korean script

Nan	Meaning
1	Invalid square root (negative number, usually)
2	Invalid addition (indeterminate such as infinity + (-infinity))
4	Invalid division (indeterminate such as 0/0)
8	Invalid multiplication (indeterminate such as 0*infinity)
9	Invalid modulo such as (a mod 0)
17	Try to convert invalid string to a number like val("x7")
33	Invalid argument in a trig function
34	Invalid argument in an inverse trig function
36	Invalid argument in a log function
37	Invalid argument in Pow function
38	Invalid argument in toolbox financial function
40	Invalid argument in hyperbolic function
42	Invalid argument in a gamma function

Symbol	Description and result
0	Digit placeholder. For example, if the value 8.9 is to be displayed as 8.90, use the format #.00
#	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall not display extra zeros when the number typed has fewer digits on either side of the decimal than there are # symbols in the format. For example, if the custom format is #.##, and 8.9 is in the cell, the number 8.9 is displayed.
?	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall put a space for insignificant zeros on either side of the decimal point so that decimal points are aligned in the column. For example, the custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in a column.
. (period)	Decimal point.
%	Percentage. If the cell contains a number between 0 and 1, and the custom format 0% is used, the application shall multiply the number by 100 and add the percentage symbol in the cell.
, (comma)	Thousands separator. The application shall separate thousands by commas if the format contains a comma that is enclosed by number signs (#) or by zeros. A comma that follows a placeholder scales the number by one thousand. For example, if the format is #.0,, and the cell value is 12,200,000 then the number 12.2 is displayed.
E- E+ e- e+	Scientific format. The application shall display a number to the right of the "E" symbol that corresponds to the number of places that the decimal point was moved. For example, if the format is 0.00E+00, and the value 12,200,000 is in the cell, the number 1.22E+07 is displayed. If the number format is #0.0E+0, then the number 12.2E+6 is displayed.
\$ -+/():space	Displays the symbol. If it is desired to display a character that differs from one of these symbols, precede the character with a backslash (\). Alternatively, enclose the character in quotation marks. For example, if the number format is (000), and the value 12 is in the cell, the number (012) is displayed.
\	Display the next character in the format. The application shall not display the backslash. For example, if the number format is 0\!, and the value 3 is in the cell, the value 3! is displayed.
*	Repeat the next character in the format enough times to fill the column to its current width. There shall not be more than one asterisk in one section of the format. If more than one asterisk appears in one section of the format, all but the last asterisk shall be ignored. For example, if the number format is 0*x, and the value 3 is in the cell, the value 3xxxxxx is displayed. The number of x characters that are displayed in the cell varies based on the width of the column.
_ (underline)	Skip the width of the next character. This is useful for lining up negative and positive values in different cells of the same column. For example, the number format _(0.0_);(0.0) aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses.
"text"	Display whatever text is inside the quotation marks. For example, the format 0.00 "dollars" displays 1.23 dollars when the value 1.23 is in the cell.
@	Text placeholder. If text is typed in the cell, the text from the cell is placed in the format where the at symbol (@) appears. For example, if the number format is "Bob "@ Smith" (including quotation marks), and the value "John" is in the cell, the value Bob John Smith is displayed.

[Black] [Green] [White] [Blue] [Magenta] [Yellow] [Cyan] [Red]

To display	As	Use this code
Months	1-12	m
Months	01-12	mm
Months	Jan-Dec	mmm
Months	January-December	mmmm
Months	J-D	mmmmm
Days	1-31	d
Days	01-31	dd
Days	Sun-Sat	ddd
Days	Sunday-Saturday	dddd
Years	00-99	yy
Years	1900-9999	yyyy
Hours	0-23	h
Hours	00-23	hh
Minutes	0-59	m
Minutes	00-59	mm
Seconds	0-59	s
Seconds	00-59	ss
Time	4 AM	h AM/PM
Time	4:36 PM	h:mm AM/PM
Time	4:36:03 P	h:mm:ss A/P
Time	4:36:03.75	h:mm:ss.00
Elapsed time	1:02	[h] :mm
Elapsed time	62:16	[mm] :ss
Elapsed time	3735.80	[ss] .00

To display	As	Use this code
1234.59	1234.6	#####.#
8.9	8.900	#.000
.631	0.6	0.#
12	12.0	#.0#
1234.568	1234.57	#.0#
44.398	44.398	???.???
102.65	102.65	???.???
2.8	2.8	???.???
5.25	5 1/4	# ??/??
5.3	5 3/10	# ??/??
12000	12,000	#,###
12000	12	#,
12400000	12.4	0.0,,