
CFMutableAttributedString Reference

Data Management: Strings, Text, & Fonts



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CFMutableAttributedString Reference

Derived From:	<i>CFPropertyList Reference</i> <i>CType Reference</i>
Framework:	CoreFoundation/CoreFoundation.h
Declared in	CFAttributedString.h
Companion guides	Property List Programming Topics for Core Foundation Strings Programming Guide for Core Foundation Data Formatting Guide for Core Foundation

Overview

Instances of `CFMutableAttributedString` manage mutable character strings and associated sets of attributes (for example, font and kerning information) that apply to individual characters or ranges of characters in the string. `CFAttributedString` as defined in `CoreFoundation` provides the basic container functionality, while higher levels provide definitions for standard attributes, their values, and additional behaviors involving these. `CFMutableAttributedString` represents a mutable string—use `CFAttributedString` to create and manage an attributed string that cannot be changed after it has been created.

iPhone OS Note: While Core Foundation on iPhone OS contains `CFMutableAttributedString`, there are no additions to the APIs in UIKit to add specific attributes such as font, style, or color, and there are no APIs to draw attributed strings.

`CFMutableAttributedString` is not a “subclass” of `CFMutableString`; that is, it does not respond to `CFMutableString` (or `CFString`) function calls. `CFAttributedString` conceptually contains a `CFMutableString` to which it applies attributes. This protects you from ambiguities caused by the semantic differences between simple and attributed string. Functions defined for `CFAttributedString` can be applied to a `CFMutableAttributedString` object.

Attributes are identified by key/value pairs stored in `CFDictionary` objects. Keys must be `CFString` objects, while the corresponding values are `CType` objects of an appropriate type. See the attribute constants in *NSAttributedString Application Kit Additions Reference* for standard attribute names on Mac OS X.

Important: Attribute dictionaries set for an attributed string must always be created with `kFCopyStringDictionaryKeyCallbacks` for their dictionary key callbacks and `kCFTypeDictionaryValueCallbacks` for their value callbacks; otherwise it's an error.

When you modify the contents of a mutable attributed string, it may have to do a lot of work to ensure it is internally consistent, and to coalesce runs of identical attributes. You can call [CFAttributedStringBeginEditing](#) (page 7) and [CFAttributedStringEndEditing](#) (page 8) around a set of related mutation calls that don't require the string to be in consistent state in between, and thereby reduce the amount of work necessary. These calls can be nested.

On Mac OS X, `CFMutableAttributedString` is “toll-free bridged” with its Cocoa Foundation counterpart, `NSMutableAttributedString`. This means that the Core Foundation type is interchangeable in function or method calls with the bridged Foundation object. Therefore, in a method where you see an `NSMutableAttributedString *` parameter, you can pass in an object of type `CFMutableAttributedStringRef`, and in a function where you see a `CFMutableAttributedStringRef` parameter, you can pass in an `NSMutableAttributedString` instance. See [Interchangeable Data Types](#) for more information on toll-free bridging.

iPhone OS Note: `NSMutableAttributedString` is not available on iPhone OS.

There is not always a 1:1 mapping between `NSMutableAttributedString`'s methods and `CFMutableAttributedString`'s functions. For example, to perform an operation equivalent to `NSMutableAttributedString`'s `appendAttributedString:` method on a `CFMutableAttributedString` object, you can use [CFAttributedStringReplaceAttributedString](#) (page 10) and specify `CFRangeMake(CFAttributedStringGetLength(attrStr), 0)` as the range. Alternatively you can cast the `CFMutableAttributedString` object to an `NSMutableAttributedString` object and send the `appendAttributedString:` message.

Functions by Task

Creating a CFMutableAttributedString

[CFAttributedStringCreateMutableCopy](#) (page 8)

Creates a mutable copy of an attributed string.

[CFAttributedStringCreateMutable](#) (page 7)

Creates a mutable attributed string.

Modifying a CFMutableAttributedString

[CFAttributedStringBeginEditing](#) (page 7)

Defers internal consistency-checking and coalescing for a mutable attributed string.

[CFAttributedStringEndEditing](#) (page 8)

Re-enables internal consistency-checking and coalescing for a mutable attributed string.

[CFAttributedStringGetMutableString](#) (page 9)

Gets as a mutable string the string for an attributed string.

[CFAttributedStringRemoveAttribute](#) (page 9)

Removes the value of a single attribute over a specified range.

[CFAttributedStringReplaceString](#) (page 10)

Modifies the string of an attributed string.

[CFAttributedStringReplaceAttributedString](#) (page 10)

Replaces the attributed substring over a range with another attributed string.

[CFAttributedStringSetAttribute](#) (page 11)

Sets the value of a single attribute over the specified range.

[CFAttributedStringSetAttributes](#) (page 12)

Sets the value of attributes of a mutable attributed string over a specified range.

Functions

CFAttributedStringBeginEditing

Defers internal consistency-checking and coalescing for a mutable attributed string.

```
void CFAttributedStringBeginEditing (
    CFMutableAttributedStringRef aStr
);
```

Parameters

str

A mutable attributed string that is to be edited.

Discussion

Defers internal consistency-checking and coalescing for a mutable attributed string. You must balance a call to this function with a corresponding [CFAttributedStringEndEditing](#) (page 8).

Availability

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringCreateMutable

Creates a mutable attributed string.

```
CFMutableAttributedStringRef CFAttributedStringCreateMutable (
    CFAllocatorRef alloc,
    CFIndex maxLength
);
```

Parameters

alloc

An allocator to be used to allocate memory for the new attributed string. Pass `NULL` or `kCFAllocatorDefault` to use the current default allocator.

maxLength

The limit on the length of the returned attributed string; exceeding this size during any subsequent editing operation is a programming error. Pass 0 to specify no limit.

Return Value

A new mutable attributed string. Ownership follows the Create Rule.

Availability

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringCreateMutableCopy

Creates a mutable copy of an attributed string.

```
CFMutableAttributedStringRef CFAttributedStringCreateMutableCopy (
    CFAllocatorRef alloc,
    CFIndex maxLength,
    CFAttributedStringRef aStr
);
```

Parameters

alloc

The allocator to be used to allocate memory for the new attributed string. Pass NULL or `kCFAllocatorDefault` to use the current default allocator.

maxLength

The limit on the length of the returned attributed string; exceeding this size during any subsequent editing operation is a programming error. Pass 0 to specify no limit.

aStr

The attributed string to copy.

Return Value

A mutable copy of *aStr*. Ownership follows the Create Rule.

Availability

Available in Mac OS X v10.4 and later.

Related Sample Code

CoreTextTest

Declared In

CFAttributedString.h

CFAttributedStringEndEditing

Re-enables internal consistency-checking and coalescing for a mutable attributed string.

```
void CFAttributedStringEndEditing (
    CFMutableAttributedStringRef aStr
);
```

Parameters*str*

A mutable attributed string, following a call to [CFAttributedStringBeginEditing](#) (page 7).

Availability

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringGetMutableString

Gets as a mutable string the string for an attributed string.

```
CFMutableStringRef CFAttributedStringGetMutableString (
    CFMutableAttributedStringRef aStr
);
```

Parameters*str*

The mutable attributed string from which to retrieve the string.

Return Value

The string for the specified attributed string as a mutable string.

Discussion

This function allows you to edit the character contents of the attributed string as if it were a CFMutableString. Attributes corresponding to the edited range are appropriately modified. If, as a result of the edit, new characters are introduced into the string, they inherit the attributes of the first replaced character from range. If no existing characters are replaced by the edit, the new characters inherit the attributes of the character preceding range if it has any, otherwise of the character following range. If the initial string is empty, the attributes for the new characters are also empty.

Availability

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringRemoveAttribute

Removes the value of a single attribute over a specified range.

```
void CFAttributedStringRemoveAttribute (
    CFMutableAttributedStringRef aStr,
    CFRange range,
    CFStringRef attrName
);
```

Parameters*str*

The mutable attributed string to modify.

*range*The range of *aStr* from which to remove the specified attribute. *range* must not exceed the bounds of *aStr*.*attrName*

The name of the attribute to remove.

DiscussionIt is *not* an error if the specified attribute does not exist over the given range.**Availability**

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringReplaceAttributedString

Replaces the attributed substring over a range with another attributed string.

```
void CFAttributedStringReplaceAttributedString (
    CFMutableAttributedStringRef aStr,
    CFRange range,
    CFAttributedStringRef replacement
);
```

Parameters*aStr*

The mutable attributed string to modify.

*range*The range of *aStr* to be modified. *range* must not specify characters outside the bounds of *aStr*.*replacement*The attributed string to replace the contents of *aStr* in *range*.**Availability**

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringReplaceString

Modifies the string of an attributed string.

```
void CFAttributedStringReplaceString (
    CFMutableAttributedStringRef aStr,
    CFRange range,
    CFStringRef replacement
);
```

Parameters*aStr*

The mutable attributed string to modify.

*range*The range of *aStr* to be modified. *range* must not specify characters outside the bounds of *aStr*.*replacement*The string to replace the existing string in *range*.**Availability**

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

CFAttributedStringSetAttribute

Sets the value of a single attribute over the specified range.

```
void CFAttributedStringSetAttribute (
    CFMutableAttributedStringRef aStr,
    CFRange range,
    CFStringRef attrName,
    CTypeRef value
);
```

Parameters*aStr*

The mutable attributed string to modify.

*range*The range of *aStr* over to which the new attributes apply. *range* must not exceed the bounds of *aStr*.*attrName*

The name of the attribute whose value to set.

*value*The value of the attribute *attrName* to apply over *range*. This value may not be NULL. If you want to remove an attribute, use [CFAttributedStringRemoveAttribute](#) (page 9).**Availability**

Available in Mac OS X v10.4 and later.

Related Sample Code

CoreTextTest

Declared In

CFAttributedString.h

CFAttributedStringSetAttributes

Sets the value of attributes of a mutable attributed string over a specified range.

```
void CFAttributedStringSetAttributes (
    CFMutableAttributedStringRef aStr,
    CFRange range,
    CFDictionaryRef replacement,
    Boolean clearOtherAttributes
);
```

Parameters

aStr

The mutable attributed string to modify.

range

The range of *aStr* over to which the new attributes apply. *range* must not exceed the bounds of *aStr*.

replacement

A dictionary that contains key-value pairs that specify the new attributes to apply to *range*. The keys must be CFString objects, and the corresponding values must be CType objects.

clearOtherAttributes

If *false*, existing attributes (that aren't being replaced) are left alone; otherwise they are cleared.

Discussion

Note that after this call, if it is mutable, changes to *replacement* will not affect the contents of the attributed string.

Availability

Available in Mac OS X v10.4 and later.

Related Sample Code

CoreTextTest

Declared In

CFAttributedString.h

Data Types

CFMutableAttributedStringRef

A reference to a CFMutableAttributedString object.

```
typedef struct __CFAttributedString *CFMutableAttributedStringRef;
```

Discussion

The `CFMutableAttributedStringRef` type refers to a mutable object that combines a CFString object with a collection of attributes that specify how the characters in the string should be displayed.

CFMutableAttributedString is an opaque type that defines the characteristics and behavior of CFMutableAttributedString objects.

CFMutableAttributedString objects also respond to all functions intended for immutable CFAttributedString objects.

Availability

Available in Mac OS X v10.4 and later.

Declared In

CFAttributedString.h

Document Revision History

This table describes the changes to *CFMutableAttributedString Reference*.

Date	Notes
2009-05-06	Added note that CFMutableAttributedString is not toll-free bridged to NSMutableAttributedString on iPhone.
2008-07-01	Added note to introduction about attributed string support in iPhone OS. Enhanced warning about attribute dictionaries requiring key and value callbacks.
2005-12-06	Made minor changes to text to conform to reference consistency guidelines.
2005-11-09	Corrected link in Companion Documents list.
2005-04-29	First version of this document.

REVISION HISTORY

Document Revision History

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- CFAttributedStringBeginEditing [function 7](#)
- CFAttributedStringCreateMutable [function 7](#)
- CFAttributedStringCreateMutableCopy [function 8](#)
- CFAttributedStringEndEditing [function 8](#)
- CFAttributedStringGetMutableString [function 9](#)
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- CFMutableAttributedStringRef [data type 12](#)