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# CFMutableDictionary Reference

Core Foundation



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Apple Inc.  
1 Infinite Loop  
Cupertino, CA 95014  
408-996-1010

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# NSMutableDictionary Reference

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<b>Derived From:</b>	CFDictionary : CFPropertyList : CType
<b>Framework:</b>	CoreFoundation/CoreFoundation.h
<b>Declared in</b>	CFDictionary.h
<b>Companion guides</b>	Collections Programming Topics for Core Foundation Property List Programming Topics for Core Foundation

## Overview

NSMutableDictionary manages dynamic dictionaries. The basic interface for managing dictionaries is provided by CFDictionary. NSMutableDictionary adds functions to modify the contents of a dictionary.

You create a mutable dictionary object using either the [CFDictionaryCreateMutable](#) (page 7) or [CFDictionaryCreateMutableCopy](#) (page 8) function. You can add key-value pairs using the [CFDictionaryAddValue](#) (page 6) and [CFDictionarySetValue](#) (page 10) functions. When adding key-value pairs to a dictionary, the keys and values are not copied—they are retained so they are not invalidated before the dictionary is deallocated. You can remove key-value pairs using the [CFDictionaryRemoveValue](#) (page 9) function. When removing key-value pairs from a dictionary, the keys and values are released.

NSMutableDictionary is “toll-free bridged” with its Cocoa Foundation counterpart, NSMutableDictionary. What this means is that the Core Foundation type is interchangeable in function or method calls with the bridged Foundation object. This means that in a method where you see an NSMutableDictionary \* parameter, you can pass in a NSMutableDictionaryRef, and in a function where you see a NSMutableDictionaryRef parameter, you can pass in an NSMutableDictionary instance. This also applies to concrete subclasses of NSMutableDictionary. See [Interchangeable Data Types](#) for more information on toll-free bridging.

## Functions by Task

### Creating a Mutable Dictionary

[CFDictionaryCreateMutable](#) (page 7)  
Creates a new mutable dictionary.

[CFDictionaryCreateMutableCopy](#) (page 8)  
Creates a new mutable dictionary with the key-value pairs from another dictionary.

## Modifying a Dictionary

[CFDictionaryAddValue](#) (page 6)

Adds a key-value pair to a dictionary if the specified key is not already present.

[CFDictionaryRemoveAllValues](#) (page 9)

Removes all the key-value pairs from a dictionary, making it empty.

[CFDictionaryRemoveValue](#) (page 9)

Removes a key-value pair.

[CFDictionaryReplaceValue](#) (page 10)

Replaces a value corresponding to a given key.

[CFDictionarySetValue](#) (page 10)

Sets the value corresponding to a given key.

## Functions

### CFDictionaryAddValue

Adds a key-value pair to a dictionary if the specified key is not already present.

```
void CFDictionaryAddValue (
    CFMutableDictionaryRef theDict,
    const void *key,
    const void *value
);
```

#### Parameters

*theDict*

The dictionary to modify. If the dictionary is a fixed-capacity dictionary and it is full before this operation, the behavior is undefined.

*key*

The key for the value to add to the dictionary—a CType object or a pointer value. The *key* is retained by the dictionary using the retain callback provided when the dictionary was created, so must be of the type expected by the callback. If a key which matches *key* is already present in the dictionary, this function does nothing ("add if absent").

*value*

A CType object or a pointer value to add to the dictionary. The *value* is retained by the dictionary using the retain callback provided when the dictionary was created, so must be of the type expected by the callback.

#### Availability

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

#### Related Sample Code

AddressBookCarbon

MoreIsBetter

MoreSCF

QISA

SeeMyFriends

### Declared In

CFDictionary.h

## CFDictionaryCreateMutable

Creates a new mutable dictionary.

```
CFMutableDictionaryRef CFDictionaryCreateMutable (
    CFAllocatorRef allocator,
    CFIndex capacity,
    const CFDictionaryKeyCallbacks *keyCallbacks,
    const CFDictionaryValueCallbacks *valueCallbacks
);
```

### Parameters

*allocator*

The allocator to use to allocate memory for the new dictionary and its storage for key-value pairs. Pass `NULL` or `kCFAllocatorDefault` to use the current default allocator.

*capacity*

The maximum number of key-value pairs that can be contained by the dictionary. The dictionary starts empty and can grow to this number of key-value pairs (and it can have less). Pass `0` to specify no limit. The value must not be negative.

*keyCallbacks*

A pointer to a `CFDictionaryKeyCallbacks` structure initialized with the callbacks to use to retain, release, describe, and compare keys in the dictionary. A copy of the contents of the callbacks structure is made, so that a pointer to a structure on the stack can be passed in or can be reused for multiple collection creations.

This value may be `NULL`, which is treated as a valid structure of version `0` with all fields `NULL`. Otherwise, if any of the fields are not valid pointers to functions of the correct type, or this value is not a valid pointer to a `CFDictionaryKeyCallbacks` structure, the behavior is undefined. If any of the keys put into the collection is not one understood by one of the callback functions, the behavior when that callback function is used is undefined.

If the dictionary will contain only `CType` objects, then pass a pointer to `kCTypeDictionaryKeyCallbacks` as this parameter to use the default callback functions.

*valueCallbacks*

A pointer to a `CFDictionaryValueCallbacks` structure initialized with the callbacks to use to retain, release, describe, and compare values in the dictionary. A copy of the contents of the callbacks structure is made, so that a pointer to a structure on the stack can be passed in or can be reused for multiple collection creations.

This value may be `NULL`, which is treated as a valid structure of version `0` with all fields `NULL`. Otherwise, if any of the fields are not valid pointers to functions of the correct type, or this value is not a valid pointer to a `CFDictionaryValueCallbacks` structure, the behavior is undefined. If any value put into the collection is not one understood by one of the callback functions, the behavior when that callback function is used is undefined.

If the dictionary will contain `CType` objects only, then pass a pointer to `kCTypeDictionaryValueCallbacks` as this parameter to use the default callback functions.

### Return Value

A new dictionary, or `NULL` if there was a problem creating the object. Ownership follows the Create Rule.

**Availability**

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

**Related Sample Code**

ImageClient

MoreIsBetter

QISA

SCSIOldAndNew

SeeMyFriends

**Declared In**

CFDictionary.h

**CFDictionaryCreateMutableCopy**

Creates a new mutable dictionary with the key-value pairs from another dictionary.

```
CFMutableDictionaryRef CFDictionaryCreateMutableCopy (
    CFAllocatorRef allocator,
    CFIndex capacity,
    CFDictionaryRef theDict
);
```

**Parameters**

*allocator*

The allocator to use to allocate memory for the new dictionary and its storage for key-value pairs. Pass `NULL` or `kCFAllocatorDefault` to use the current default allocator.

*capacity*

The maximum number of key-value pairs that can be contained by the returned dictionary. The dictionary starts empty, and can grow to this number of key-value pairs (and it can have less). The value must be greater than or equal to the count of *theDict*, or 0 to specify no limit

*theDict*

The dictionary to copy. The keys and values from the dictionary are copied as pointers into the new dictionary, not that which the values point to (if anything). The keys and values are also retained by the new dictionary. The count of the new dictionary is the same as the count of *theDict*. The new dictionary uses the same callbacks as *theDict*.

**Return Value**

A new dictionary that contains the same values as *theDict*. Ownership follows the Create Rule.

**Availability**

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

**Related Sample Code**

BSDLLCTest

MoreIsBetter

MoreSCF

QISA

Quartz 2D Transformer



**Declared In**

CFDictionary.h

**CFDictionaryRemoveAllValues**

Removes all the key-value pairs from a dictionary, making it empty.

```
void CFDictionaryRemoveAllValues (
    CFMutableDictionaryRef theDict
);
```

**Parameters***theDict*

The dictionary to modify.

**Availability**

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

**Related Sample Code**

DockBrowser

SeeMyFriends

**Declared In**

CFDictionary.h

**CFDictionaryRemoveValue**

Removes a key-value pair.

```
void CFDictionaryRemoveValue (
    CFMutableDictionaryRef theDict,
    const void *key
);
```

**Parameters***theDict*

The dictionary to modify.

*key*The key of the value to remove from *theDict*. If a key which matches *key* is present in *theDict*, the key-value pair is removed from the dictionary, otherwise this function does nothing ("remove if present").**Availability**

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

**Related Sample Code**

DockBrowser

ImageClient

MoreIsBetter

MoreSCF

QISA

**Declared In**

CFDictionary.h

**CFDictionaryReplaceValue**

Replaces a value corresponding to a given key.

```
void CFDictionaryReplaceValue (
    CFMutableDictionaryRef theDict,
    const void *key,
    const void *value
);
```

**Parameters***theDict*

The dictionary to modify.

*key*The key of the value to replace in *theDict*. If a key which matches *key* is present in the dictionary, the value is changed to the *value*, otherwise this function does nothing ("replace if present").*value*The new value for *key*. The *value* object is retained by *theDict* using the retain callback provided when *theDict* was created, and the old value is released. *value* must be of the type expected by the retain and release callbacks.**Availability**

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

**Related Sample Code**

SeeMyFriends

**Declared In**

CFDictionary.h

**CFDictionarySetValue**

Sets the value corresponding to a given key.

```
void CFDictionarySetValue (
    CFMutableDictionaryRef theDict,
    const void *key,
    const void *value
);
```

**Parameters***theDict*

The dictionary to modify. If this parameter is a fixed-capacity dictionary and it is full before this operation, and the key does not exist in the dictionary, the behavior is undefined.

*key*

The key of the value to set in *theDict*. If a key which matches *key* is already present in the dictionary, only the value for the key is changed ("add if absent, replace if present"). If no key matches *key*, the key-value pair is added to the dictionary.

If a key-value pair is added, both *key* and *value* are retained by the dictionary, using the retain callback provided when *theDict* was created. *key* must be of the type expected by the key retain callback.

*value*

The value to add to or replace in *theDict*. *value* is retained using the value retain callback provided when *theDict* was created, and the previous value if any is released. *value* must be of the type expected by the retain and release callbacks.

**Availability**

Available in CarbonLib v1.0 and later.

Available in Mac OS X v10.0 and later.

**Related Sample Code**

ImageClient

MoreIsBetter

MoreSCF

QISA

SCSIOldAndNew

**Declared In**

CFDictionary.h

## Data Types

**CFMutableDictionaryRef**

A reference to a mutable dictionary object.

```
typedef struct __CFDictionary *CFMutableDictionaryRef;
```

**Availability**

Available in Mac OS X v10.0 and later.

**Declared In**

CFDictionary.h



# Document Revision History

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This table describes the changes to *CFMutableDictionary Reference*.

Date	Notes
2005-12-06	Made minor changes to text to conform to reference consistency guidelines.
2005-04-29	Moved Introduction to new Introduction page.
2004-10-05	Clarification of use of predefined callback structures in <a href="#">CFDictionaryCreateMutable</a> (page 7).
2003-08-01	Enhanced description of all the <code>kCFTType*Callbacks</code> and added link to Carbon-Cocoa integration document.
2003-01-01	First version of this document.

## REVISION HISTORY

### Document Revision History

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