
Foundation Data Types Reference



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Foundation Data Types Reference

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Overview

This document describes the data types and constants found in the Foundation framework.

Data Types

NSAppleEventManagerSuspensionID

Identifies an Apple event whose handling has been suspended. Can be used to resume handling of the Apple event.

```
typedef const struct __NSAppleEventManagerSuspension
*NSAppleEventManagerSuspensionID;
```

Availability

Available in Mac OS X v10.3 and later.

Declared In

NSAppleEventManager.h

NSByteOrder

These constants specify an endian format.

```
enum _NSByteOrder {
    NS_UnknownByteOrder = CFByteOrderUnknown,
    NS_LittleEndian = CFByteOrderLittleEndian,
    NS_BigEndian = CFByteOrderBigEndian
};
```

Constants

NS_UnknownByteOrder

The byte order is unknown.

Available in Mac OS X v10.0 and later.

Declared in NSByteOrder.h.

NS_LittleEndian

The byte order is little endian.

Available in Mac OS X v10.0 and later.

Declared in NSByteOrder.h.

NS_BigEndian

The byte order is big endian.

Available in Mac OS X v10.0 and later.

Declared in NSByteOrder.h.

Discussion

These constants are returned by NSHostByteOrder.

NSComparator

Defines the signature for a Block used for comparison operations.

```
typedef NSComparisonResult (^NSComparator)(id obj1, id obj2);
```

Discussion

You use NSComparator Blocks in comparison operations such as NSArray's `indexOfObject:inSortedRange:options:usingComparator:`.

NSComparisonResult

These constants are used to indicate how items in a request are ordered.

```
enum {
    NSOrderedAscending = -1,
    NSOrderedSame,
    NSOrderedDescending
};
typedef NSInteger NSComparisonResult;
```

Constants

`NSOrderedAscending`

The left operand is smaller than the right operand.

Available in Mac OS X v10.0 and later.

Declared in `NSObjCRuntime.h`.

`NSOrderedSame`

The two operands are equal.

Available in Mac OS X v10.0 and later.

Declared in `NSObjCRuntime.h`.

`NSOrderedDescending`

The left operand is greater than the right operand.

Available in Mac OS X v10.0 and later.

Declared in `NSObjCRuntime.h`.

Discussion

These constants are used to indicate how items in a request are ordered, from the first one given in a method invocation or function call to the last (that is, left to right in code).

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSObjCRuntime.h`

NSDecimal

Used to describe a decimal number.

```
typedef struct {
    signed int _exponent:8;
    unsigned int _length:4;
    unsigned int _isNegative:1;
    unsigned int _isCompact:1;
    unsigned int _reserved:18;
    unsigned short _mantissa[NSDecimalMaxSize];
} NSDecimal;
```

Discussion

The fields of `NSDecimal` are private.

Used by the functions described in "Decimals".

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSDecimal.h

NSEnumerationOptions

Type to specify behavior during enumeration.

```
typedef NSUInteger NSEnumerationOptions;
```

Availability

Available in Mac OS X v10.6 and later.

Declared In

NSObjCRuntime.h

NSHashEnumerator

Allows successive elements of a hash table to be returned each time this structure is passed to `NSNextHashEnumeratorItem`.

```
typedef struct {
    unsigned _pi;
    unsigned _si void *_bs;
} NSHashEnumerator;
```

Discussion

The fields of `NSHashEnumerator` are private.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSHashTable.h

NSHashTable

The opaque data type used by the functions described in "Hash Tables".

```
typedef struct _NSHashTable NSHashTable;
```

Discussion

For Mac OS X v10.5 and later, see also `NSHashTable`.

Availability

Available in Mac OS X v10.0 through Mac OS X v10.4.

Declared In

NSHashTable.h

NSHashTableCallbacks

Defines a structure that contains the function pointers used to configure behavior of `NSHashTable` with respect to elements within a hash table.

```
typedef struct {
    unsigned (*hash)(NSHashTable *table, const void *);
    BOOL (*isEqual)(NSHashTable *table, const void *, const void *);
    void (*retain)(NSHashTable *table, const void *);
    void (*release)(NSHashTable *table, void *);
    NSString *(*describe)(NSHashTable *table, const void *);
} NSHashTableCallbacks;
```

Fields

`hash`

Points to the function that must produce hash code for elements of the hash table. If `NULL`, the pointer value is used as the hash code. Second parameter is the element for which hash code should be produced.

`isEqual`

Points to the function that compares second and third parameters. If `NULL`, then `==` is used for comparison.

`retain`

Points to the function that increments a reference count for the given element. If `NULL`, then nothing is done for reference counting.

`release`

Points to the function that decrements a reference count for the given element, and if the reference count becomes 0, frees the given element. If `NULL`, then nothing is done for reference counting or releasing.

`describe`

Points to the function that produces an autoreleased `NSString *` describing the given element. If `NULL`, then the hash table produces a generic string description.

Discussion

All functions must know the types of things in the hash table to be able to operate on them. Sets of predefined call backs are described in "NSHashTable Callbacks".

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSHashTable.h`

NSHashTableOptions

Specifies a bitfield used to configure the behavior of elements in an instance of `NSHashTable`.

```
typedef NSUInteger NSHashTableOptions
```

Declared In

`NSHashTable.h`

NSInteger

Used to describe an integer.

```

#if __LP64__ || TARGET_OS_EMBEDDED || TARGET_OS_IPHONE || TARGET_OS_WIN32 ||
NS_BUILD_32_LIKE_64
typedef long NSInteger;
#else
typedef int NSInteger;
#endif

```

Discussion

When building 32-bit applications, NSInteger is a 32-bit integer. A 64-bit application treats NSInteger as a 64-bit integer.

Availability

Available in Mac OS X v10.5 and later.

Declared In

NSObjCRuntime.h

NSMapEnumerator

Allows successive elements of a map table to be returned each time this structure is passed to NSNextMapEnumeratorPair.

```

typedef struct {
    unsigned _pi;
    unsigned _si;
    void *_bs;
} NSMapEnumerator;

```

Discussion

The fields of NSMapEnumerator are private.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSMapTable.h

NSMapTable

The opaque data type used by the functions described in "Map Tables".

```

typedef struct _NSMapTable NSMapTable;

```

Discussion

For Mac OS X v10.5 and later, see also NSMapTable.

Availability

Available in Mac OS X v10.0 through Mac OS X v10.4.

Declared In

NSMapTable.h

NSMutableDictionaryKeyCallbacks

The function pointers used to configure behavior of `NSMutableDictionary` with respect to key elements within a map table.

```
typedef struct {
    unsigned (*hash)(NSMutableDictionary *table, const void *);
    BOOL (*isEqual)(NSMutableDictionary *table, const void *, const void *);
    void (*retain)(NSMutableDictionary *table, const void *);
    void (*release)(NSMutableDictionary *table, void *);
    NSString *(*describe)(NSMutableDictionary *table, const void *);
    const void *notAKeyMarker;
} NSMutableDictionaryKeyCallbacks;
```

Fields

`hash`

Points to the function which must produce hash code for key elements of the map table. If `NULL`, the pointer value is used as the hash code. Second parameter is the element for which hash code should be produced.

`isEqual`

Points to the function which compares second and third parameters. If `NULL`, then `==` is used for comparison.

`retain`

Points to the function which increments a reference count for the given element. If `NULL`, then nothing is done for reference counting.

`release`

Points to the function which decrements a reference count for the given element, and if the reference count becomes zero, frees the given element. If `NULL`, then nothing is done for reference counting or releasing.

`describe`

Points to the function which produces an autoreleased `NSString *` describing the given element. If `NULL`, then the map table produces a generic string description.

`notAKeyMarker`

No key put in map table can be this value. An exception is raised if attempt is made to use this value as a key

Discussion

All functions must know the types of things in the map table to be able to operate on them. Sets of predefined call backs are described in "NSMutableDictionary Key Call Backs".

Two predefined values to use for `notAKeyMarker` are `NSNotAnIntMapKey` and `NSNotAPointerMapKey`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSMutableDictionary.h`

NSMutableDictionaryOptions

Specifies a bitfield used to configure the behavior of elements in an instance of `NSMutableDictionary`.

```
typedef NSUInteger NSMapTableOptions
```

Declared In

NSMapTable.h

NSMapTableValueCallbacks

The function pointers used to configure behavior of `NSMapTable` with respect to value elements within a map table.

```
typedef struct {
    void (*retain)(NSMapTable *table, const void *);
    void (*release)(NSMapTable *table, void *);
    NSString *(*describe)(NSMapTable *table, const void *);
} NSMapTableValueCallbacks;
```

Fields

`retain`

Points to the function that increments a reference count for the given element. If `NULL`, then nothing is done for reference counting.

`release`

Points to the function that decrements a reference count for the given element, and if the reference count becomes zero, frees the given element. If `NULL`, then nothing is done for reference counting or releasing.

`describe`

Points to the function that produces an autoreleased `NSString *` describing the given element. If `NULL`, then the map table produces a generic string description.

Discussion

All functions must know the types of things in the map table to be able to operate on them. Sets of predefined call backs are described in "NSMapTable Value Callbacks".

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSMapTable.h

NSPoint

Represents a point in a Cartesian coordinate system.

```
typedef struct _NSPoint {
    CGFloat x;
    CGFloat y;
} NSPoint;
```

Fields

`x`

The x coordinate.

`y`

The y coordinate.

Special Considerations

Prior to Mac OS X v10.5 the coordinates were represented by `float` values rather than `CGFloat` values.

When building for 64 bit systems, or building 32 bit like 64 bit, `NSPoint` is typedef'd to `CGPoint`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSPointArray

Type indicating a parameter is array of `NSPoint` structures.

```
typedef NSPoint *NSPointArray;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSPointPointer

Type indicating a parameter is a pointer to an `NSPoint` structure.

```
typedef NSPoint *NSPointPointer;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSRange

A structure used to describe a portion of a series—such as characters in a string or objects in an `NSArray` object.

```
typedef struct _NSRange {
    NSUInteger location;
    NSUInteger length;
} NSRange;
```

Fields

`location`

The start index (0 is the first, as in C arrays).

`length`

The number of items in the range (can be 0).

Discussion

Foundation functions that operate on ranges include the following:

```
NSEqualRanges  
NSIntersectionRange  
NSLocationInRange  
NSMakeRange  
NSMaxRange  
NSRangeFromString  
NSStringFromRange  
NSUnionRange
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSRange.h

NSRangePointer

Type indicating a parameter is a pointer to an NSRange structure.

```
typedef NSRange *NSRangePointer;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSRange.h

NSRect

Represents a rectangle.

```
typedef struct _NSRect {  
    NSPoint origin;  
    NSSize size;  
} NSRect;
```

Fields

origin

The origin of the rectangle (its starting x coordinate and y coordinate).

size

The width and height of the rectangle, as measured from the origin.

Special Considerations

When building for 64 bit systems, or building 32 bit like 64 bit, NSRect is typedef'd to CGRect.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSGeometry.h

NSRectArray

Type indicating a parameter is array of `NSRect` structures.

```
typedef NSRect *NSRectArray;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSRectEdge

Identifiers used by `NSDivideRect` to specify the edge of the input rectangle from which the division is measured.

```
typedef enum _NSRectEdge {
    NSMinXEdge = 0,
    NSMinYEdge = 1,
    NSMaxXEdge = 2,
    NSMaxYEdge = 3
} NSRectEdge;
```

Constants

`NSMinXEdge`

Specifies the left edge of the input rectangle.

The input rectangle is divided vertically, and the leftmost rectangle with the width of `amount` is placed in `slice`.

Available in Mac OS X v10.0 and later.

Not available to 64-bit applications.

Declared in `NSGeometry.h`.

`NSMinYEdge`

Specifies the bottom edge of the input rectangle.

The input rectangle is divided horizontally, and the bottom rectangle with the height of `amount` is placed in `slice`.

Available in Mac OS X v10.0 and later.

Not available to 64-bit applications.

Declared in `NSGeometry.h`.

`NSMaxXEdge`

Specifies the right edge of the input rectangle.

The input rectangle is divided vertically, and the rightmost rectangle with the width of `amount` is placed in `slice`.

Available in Mac OS X v10.0 and later.

Not available to 64-bit applications.

Declared in `NSGeometry.h`.

`NSMaxYEdge`

Specifies the top edge of the input rectangle.

The input rectangle is divided horizontally, and the top rectangle with the height of `amount` is placed in `slice`.

Available in Mac OS X v10.0 and later.

Not available to 64-bit applications.

Declared in `NSGeometry.h`.

Discussion

The parameters `amount` and `slice` are defined by `NSDivideRect`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSRectPointer

Type indicating a parameter is a pointer to an `NSRect` structure.

```
typedef NSRect *NSRectPointer;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSSearchPathDirectory

These constants specify the location of a variety of directories.

```
enum {
    NSApplicationDirectory = 1,
    NSDemoApplicationDirectory,
    NSDeveloperApplicationDirectory,
    NSAdminApplicationDirectory,
    NSLibraryDirectory,
    NSDeveloperDirectory,
    NSUserDirectory,
    NSDocumentationDirectory,
    NSDocumentDirectory,
    NSCoreServiceDirectory,
    NSAutosavedInformationDirectory = 11,
    NSDesktopDirectory = 12,
    NSCachesDirectory = 13,
    NSApplicationSupportDirectory = 14,
    NSDownloadsDirectory = 15,
    NSInputMethodsDirectory = 16,
    NSMoviesDirectory = 17,
    NSMusicDirectory = 18,
    NSPicturesDirectory = 19,
    NSPrinterDescriptionDirectory = 20,
    NSSharedPublicDirectory = 21,
    NSPreferencePanelsDirectory = 22,
    NSItemReplacementDirectory = 99,
    NSAllApplicationsDirectory = 100,
    NSAllLibrariesDirectory = 101
};
typedef NSUInteger NSSearchPathDirectory;
```

Constants

NSApplicationDirectory

Supported applications (/Applications).

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSDemoApplicationDirectory

Unsupported applications and demonstration versions.

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSDeveloperApplicationDirectory

Developer applications (/Developer/Applications).

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSAdminApplicationDirectory

System and network administration applications.

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSLibraryDirectory

Various user-visible documentation, support, and configuration files (/Library).

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

`NSDeveloperDirectory`

Developer resources (`/Developer`).

Deprecated: Beginning with Xcode 3.0, developer tools can be installed in any location.

Available in Mac OS X v10.0 and later.

Declared in `NSPathUtilities.h`.

`NSUserDirectory`

User home directories (`/Users`).

Available in Mac OS X v10.0 and later.

Declared in `NSPathUtilities.h`.

`NSDocumentationDirectory`

Documentation.

Available in Mac OS X v10.0 and later.

Declared in `NSPathUtilities.h`.

`NSDocumentDirectory`

Document directory.

Available in Mac OS X v10.2 and later.

Declared in `NSPathUtilities.h`.

`NSCoreServiceDirectory`

Location of core services (`System/Library/CoreServices`).

Available in Mac OS X v10.4 and later.

Declared in `NSPathUtilities.h`.

`NSAutosavedInformationDirectory`

Location of user's autosaved documents `Documents/Autosaved`

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSDesktopDirectory`

Location of user's desktop directory.

Available in Mac OS X v10.4 and later.

Declared in `NSPathUtilities.h`.

`NSCachesDirectory`

Location of discardable cache files (`Library/Caches`).

Available in Mac OS X v10.4 and later.

Declared in `NSPathUtilities.h`.

`NSApplicationSupportDirectory`

Location of application support files (`Library/Application Support`).

Available in Mac OS X v10.4 and later.

Declared in `NSPathUtilities.h`.

`NSDownloadsDirectory`

Location of the user's downloads directory.

The `NSDownloadsDirectory` flag will only produce a path only when the `NSUserDomainMask` is provided.

Available in Mac OS X v10.5 and later.

Declared in `NSPathUtilities.h`.

`NSInputMethodsDirectory`

Location of Input Methods (*Library/Input Methods*)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSMoviesDirectory`

Location of user's Movies directory (`~/Movies`)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSMusicDirectory`

Location of user's Music directory (`~/Music`)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSPicturesDirectory`

Location of user's Pictures directory (`~/Pictures`)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSPrinterDescriptionDirectory`

Location of system's PPDs directory (`Library/Printers/PPDs`)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSSharedPublicDirectory`

Location of user's Public sharing directory (`~/Public`)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSPreferencePanesDirectory`

Location of the PreferencePanes directory for use with System Preferences (`Library/PreferencePanes`)

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSItemReplacementDirectory`

For use with `NSFileManager` method

`URLForDirectory:inDomain:appropriateForURL:create:error:`

Available in Mac OS X v10.6 and later.

Declared in `NSPathUtilities.h`.

`NSAllApplicationsDirectory`

All directories where applications can occur.

Available in Mac OS X v10.0 and later.

Declared in `NSPathUtilities.h`.

`NSAllLibrariesDirectory`

All directories where resources can occur.

Available in Mac OS X v10.0 and later.

Declared in `NSPathUtilities.h`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSPathUtilities.h

NSSearchPathDomainMask

Search path domain constants specifying base locations for the [NSSearchPathDirectory](#) (page 16) type.

```
enum {
    NSUserDomainMask = 1,
    NSLocalDomainMask = 2,
    NSNetworkDomainMask = 4,
    NSSystemDomainMask = 8,
    NSAllDomainsMask = 0xffff,
};
typedef NSUInteger NSSearchPathDomainMask;
```

Constants

NSUserDomainMask

The user's home directory—the place to install user's personal items (~).

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSLocalDomainMask

Local to the current machine—the place to install items available to everyone on this machine.

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSNetworkDomainMask

Publicly available location in the local area network—the place to install items available on the network (/Network).

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSSystemDomainMask

Provided by Apple — can't be modified (/System).

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

NSAllDomainsMask

All domains.

Includes all of the above and future items.

Available in Mac OS X v10.0 and later.

Declared in NSPathUtilities.h.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSPathUtilities.h

NSSize

Represents a two-dimensional size.

```
typedef struct _NSSize {
    CGFloat width;
    CGFloat height;
} NSSize;
```

Fields

`width`

The width.

`height`

The height.

Discussion

Normally, the values of `width` and `height` are non-negative. The functions that create an `NSSize` structure do not prevent you from setting a negative value for these attributes. If the value of `width` or `height` is negative, however, the behavior of some methods may be undefined.

Special Considerations

Prior to Mac OS X v10.5 the width and height were represented by `float` values rather than `CGFloat` values.

When building for 64 bit systems, or building 32 bit like 64 bit, `NSSize` is typedef'd to `CGSize`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSSizeArray

Type indicating a parameter is array of `NSSize` structures.

```
typedef NSSize *NSSizeArray;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSSizePointer

Type indicating parameter is a pointer to an `NSSize` structure.

```
typedef NSSize *NSSizePointer;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSGeometry.h`

NSSocketNativeHandle

Type for the platform-specific native socket handle.

```
typedef int NSSocketNativeHandle;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSPort.h

NSSortOptions

Type to specify behavior during sort operations.

```
typedef NSUInteger NSSortOptions;
```

Availability

Available in Mac OS X v10.6 and later.

Declared In

NSObjCRuntime.h

NSStringEncoding

Type representing string-encoding values.

```
typedef NSUInteger NSStringEncoding;
```

Discussion

See String Encodings for a list of values.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSString.h

NSSwappedDouble

Opaque structure containing endian-independent `double` value.

```
typedef struct {  
    unsigned long long v;  
} NSSwappedDouble;
```

Discussion

The fields of an `NSSwappedDouble` are private.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSByteOrder.h

NSSwappedFloat

Opaque type containing an endian-independent float value.

```
typedef struct {
    unsigned long v;
} NSSwappedFloat;
```

Discussion

The fields of an `NSSwappedFloat` are private.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSByteOrder.h

NSTimeInterval

Used to specify a time interval, in seconds.

```
typedef double NSTimeInterval;
```

Discussion

`NSTimeInterval` is always specified in seconds; it yields sub-millisecond precision over a range of 10,000 years.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSDate.h

NSUncaughtExceptionHandler

Used for the function handling exceptions outside of an exception-handling domain.

```
typedef volatile void NSUncaughtExceptionHandler(NSException *exception);
```

Discussion

You can set exception handlers using `NSSetUncaughtExceptionHandler`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSException.h

NSUInteger

Used to describe an unsigned integer.

```
#if __LP64__ || TARGET_OS_EMBEDDED || TARGET_OS_IPHONE || TARGET_OS_WIN32 ||  
NS_BUILD_32_LIKE_64  
typedef unsigned long NSUInteger;  
#else  
typedef unsigned int NSUInteger;  
#endif
```

Discussion

When building 32-bit applications, NSUInteger is a 32-bit unsigned integer. A 64-bit application treats NSUInteger as a 64-bit unsigned integer.

Availability

Available in Mac OS X v10.5 and later.

Declared In

NSObjCRuntime.h

NSZone

Used to identify and manage memory zones.

```
typedef struct _NSZone NSZone;
```

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSZone.h

Document Revision History

This table describes the changes to *Foundation Data Types Reference*.

Date	Notes
2009-08-20	Added additional common directory enums. Removed obsolete NSObjCValueType.
2009-04-21	Updated for Mac OS X v10.6.
2008-09-09	Added descriptions for NSInteger and NSUInteger.
2008-03-11	Updated float to CGFloat where appropriate.
2007-12-11	Enhanced the definitions for constants in NSRectEdge.
2007-10-31	Added NSDownloadsDirectory constant for obtaining the user's Downloads location; corrected the definitions for constants in NSRectEdge.
2007-07-19	Corrected minor typographical errors.
Leopard WWDC	Updated for Mac OS X v10.5.
2006-06-28	Removed references to retired document.
2006-05-23	First publication of this content as a separate document.

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