
SCNetworkReachability Reference

Networking, Internet, & Web



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SCNetworkReachability Reference

Framework:	SystemConfiguration
Declared in	SCNetworkReachability.h

Overview

The `SCNetworkReachability` programming interface allows an application to determine the status of a system's current network configuration and the reachability of a target host. A remote host is considered reachable when a data packet, sent by an application into the network stack, can leave the local device. Reachability does not guarantee that the data packet will actually be received by the host.

The `SCNetworkReachability` programming interface supports a synchronous and an asynchronous model. In the synchronous model, you get the reachability status by calling the [SCNetworkReachabilityGetFlags](#) (page 8) function. In the asynchronous model, you can schedule the `SCNetworkReachability` object on the run loop of a client object's thread. The client implements a callback function to receive notifications when the reachability status of a given remote host changes. Note that these functions follow Core Foundation naming conventions. A function that has "Create" or "Copy" in its name returns a reference you must release with the `CFRelease` function.

For information about detecting and interpreting errors generated by calling these functions, see *System Configuration Reference*.

Functions by Task

Creating a Reachability Reference

[SCNetworkReachabilityCreateWithAddress](#) (page 6)

Creates a reachability reference to the specified network address.

[SCNetworkReachabilityCreateWithAddressPair](#) (page 6)

Creates a reachability reference to the specified network address.

[SCNetworkReachabilityCreateWithName](#) (page 7)

Creates a reachability reference to the specified network host or node name.

Determining Reachability Status

[SCNetworkReachabilityGetFlags](#) (page 8)

Determines if the specified network target is reachable using the current network configuration.

Preparing to Determine Reachability

[SCNetworkReachabilityGetTypeID](#) (page 8)

Returns the type identifier of all `SCNetworkReachability` instances.

[SCNetworkReachabilitySetCallback](#) (page 9)

Assigns a client to the specified target, which receives callbacks when the reachability of the target changes.

[SCNetworkReachabilityScheduleWithRunLoop](#) (page 9)

Schedules the specified network target with the specified run loop and mode.

[SCNetworkReachabilityUnscheduleFromRunLoop](#) (page 10)

Unschedules the specified target from the specified run loop and mode.

[SCNetworkReachabilitySetDispatchQueue](#) (page 10)

Schedules callbacks for the specified target on the specified dispatch queue.

Functions

SCNetworkReachabilityCreateWithAddress

Creates a reachability reference to the specified network address.

```
SCNetworkReachabilityRef SCNetworkReachabilityCreateWithAddress (
    CFAllocatorRef allocator,
    const struct sockaddr *address
);
```

Parameters

allocator

The allocator to use. Pass `NULL` or `kCFAllocatorDefault` to use the default allocator.

address

The address of the desired host.

Return Value

A new immutable reachability reference. You must release the returned value.

Discussion

You can use the reachability reference returned by this function to monitor the reachability of the target host.

Availability

Available in Mac OS X v10.3 and later.

Declared In

`SCNetworkReachability.h`

SCNetworkReachabilityCreateWithAddressPair

Creates a reachability reference to the specified network address.

```
SCNetworkReachabilityRef SCNetworkReachabilityCreateWithAddressPair (
    CFAllocatorRef allocator,
    const struct sockaddr *localAddress,
    const struct sockaddr *remoteAddress
);
```

Parameters*allocator*

The allocator to use. Pass `NULL` or `kCFAllocatorDefault` to use the default allocator.

localAddress

The local address associated with a network connection. If `NULL`, only the remote address is of interest.

remoteAddress

The remote address associated with a network connection. If `NULL`, only the local address is of interest.

Return Value

A new immutable reachability reference. You must release the returned value.

Discussion

You can use the reachability reference returned by this function to monitor the reachability of the target host.

Availability

Available in Mac OS X v10.3 and later.

Declared In

`SCNetworkReachability.h`

SCNetworkReachabilityCreateWithName

Creates a reachability reference to the specified network host or node name.

```
SCNetworkReachabilityRef SCNetworkReachabilityCreateWithName (
    CFAllocatorRef allocator,
    const char *nodename
);
```

Parameters*allocator*

The allocator to use. Pass `NULL` or `kCFAllocatorDefault` to use the default allocator.

nodename

The node name of the desired host. This name is the same as that passed to the `gethostbyname(3)` or `getaddrinfo(3)` functions.

Return Value

A new immutable reachability reference. You must release the returned value.

Discussion

You can use the reachability reference returned by this function to monitor the reachability of the target host.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

SimpleReach

Declared In

SCNetworkReachability.h

SCNetworkReachabilityGetFlags

Determines if the specified network target is reachable using the current network configuration.

```
Boolean SCNetworkReachabilityGetFlags (
    SCNetworkReachabilityRef target,
    SCNetworkReachabilityFlags *flags
);
```

Parameters*target*

The network reference associated with the address or name to be checked for reachability.

flags

A pointer to memory that, on output, is filled with flags that describe the reachability of the specified target. (See [“Network Reachability Flags”](#) (page 12) for possible values.)

Return Value

TRUE if the flags are valid; FALSE if the status could not be determined.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

SimpleReach

Declared In

SCNetworkReachability.h

SCNetworkReachabilityGetTypeID

Returns the type identifier of all `SCNetworkReachability` instances.

```
CTypeID SCNetworkReachabilityGetTypeID (
    void
);
```

Return Value

The type identifier of all `SCNetworkReachability` instances.

Availability

Available in Mac OS X v10.3 and later.

Declared In

SCNetworkReachability.h

SCNetworkReachabilityScheduleWithRunLoop

Schedules the specified network target with the specified run loop and mode.

```

Boolean SCNetworkReachabilityScheduleWithRunLoop (
    SCNetworkReachabilityRef target,
    CFRunLoopRef runLoop,
    CFStringRef runLoopMode
);

```

Parameters

target

The address or name that is set up for asynchronous notifications. Must not be NULL.

runLoop

The run loop on which the target should be scheduled. Must not be NULL.

runLoopMode

The mode in which to schedule the target. Must not be NULL.

Return Value

TRUE if the target is scheduled successfully; otherwise, FALSE.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

SimpleReach

Declared In

SCNetworkReachability.h

SCNetworkReachabilitySetCallback

Assigns a client to the specified target, which receives callbacks when the reachability of the target changes.

```

Boolean SCNetworkReachabilitySetCallback (
    SCNetworkReachabilityRef target,
    SCNetworkReachabilityCallback callout,
    SCNetworkReachabilityContext *context
);

```

Parameters

target

The network reference associated with the address or name to be checked for reachability.

callout

The function to be called when the reachability of the target changes. If NULL, the current client for the target is removed.

context

The reachability context associated with the callout. This value may be NULL.

Return Value

TRUE if the notification client was successfully set; otherwise, FALSE.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

SimpleReach

Declared In

SCNetworkReachability.h

SCNetworkReachabilitySetDispatchQueue

Schedules callbacks for the specified target on the specified dispatch queue.

```
Boolean SCNetworkReachabilitySetDispatchQueue (
    SCNetworkReachabilityRef target,
    dispatch_queue_t queue
);
```

Parameters*target*

The address or name that is set up for asynchronous notifications. Must not be NULL.

queue

The libdispatch queue on which the target should run. Pass NULL to disable notifications and release the queue.

Return Value

TRUE if the target is scheduled successfully; otherwise, FALSE.

Availability

Available in Mac OS X v10.6 and later.

Declared In

SCNetworkReachability.h

SCNetworkReachabilityUnscheduleFromRunLoop

Unschedules the specified target from the specified run loop and mode.

```
Boolean SCNetworkReachabilityUnscheduleFromRunLoop (
    SCNetworkReachabilityRef target,
    CFRunLoopRef runLoop,
    CFStringRef runLoopMode
);
```

Parameters*target*

The address or name that is set up for asynchronous notifications. Must not be NULL.

runLoop

The run loop on which the target should be unscheduled. Must not be NULL.

runLoopMode

The mode in which to unschedule the target. Must not be NULL.

Return Value

TRUE if the target is unscheduled successfully; otherwise, FALSE.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

SimpleReach

Declared In

SCNetworkReachability.h

Data Types

SCNetworkReachabilityRef

The handle to a network address or name.

```
typedef const struct __SCNetworkReachability * SCNetworkReachabilityRef;
```

Availability

Available in Mac OS X v10.3 and later.

Declared In

SCNetworkReachability.h

SCNetworkReachabilityContext

Structure containing user-specified data and callbacks used with [SCNetworkReachabilitySetCallback](#) (page 9).

```
typedef struct {
    CFIndex version;
    void * info;
    const void *(*retain)(const void *info);
    void (*release)(const void *info);
    CFStringRef (*copyDescription)(const void *info);
} SCNetworkReachabilityContext;
```

Fields

version

The version number of the structure type being passed in as a parameter to an `SCDynamicStore` creation function, such as `SCDynamicStoreCreate`. This structure is version 0.

info

A C pointer to a user-specified block of data.

retain

The callback used to add a retain for the info field. If this parameter is not a pointer to a function of the correct prototype, the behavior is undefined. The value can be `NULL`.

release

The callback used to remove a retain previously added for the info field. If this parameter is not a pointer to a function of the correct prototype, the behavior is undefined. The value can be `NULL`.

`copyDescription`

The callback used to provide a description of the *info* field.

Availability

Available in Mac OS X v10.3 and later.

Declared In

SCNetworkReachability.h

SCNetworkReachabilityCallback

Type of callback function used when the reachability of a network address or name changes.

```
typedef void (*SCNetworkReachabilityCallback) (
    SCNetworkReachabilityRef target,
    SCNetworkReachabilityFlags flags,
    void *info
);
```

Fields

`target`

The network target being monitored for changes.

`flags`

The flags representing the reachability status of the network address or name (see [“Network Reachability Flags”](#) (page 12) for information about these flags).

`info`

A C pointer to a user-specified block of data.

Constants

Network Reachability Flags

Flags that indicate the reachability of a network node name or address, including whether a connection is required, and whether some user intervention might be required when establishing a connection.

```
enum {
    kSCNetworkReachabilityFlagsTransientConnection = 1<<0,
    kSCNetworkReachabilityFlagsReachable = 1<<1,
    kSCNetworkReachabilityFlagsConnectionRequired = 1<<2,
    kSCNetworkReachabilityFlagsConnectionOnTraffic = 1<<3,
    kSCNetworkReachabilityFlagsInterventionRequired = 1<<4,
    kSCNetworkReachabilityFlagsConnectionOnDemand = 1<<5,
    kSCNetworkReachabilityFlagsIsLocalAddress = 1<<16,
    kSCNetworkReachabilityFlagsIsDirect = 1<<17,
    kSCNetworkReachabilityFlagsConnectionAutomatic =
kSCNetworkReachabilityFlagsConnectionOnTraffic
};
typedef    uint32_t    SCNetworkReachabilityFlags;
```

Constants

`kSCNetworkReachabilityFlagsTransientConnection`

The specified node name or address can be reached via a transient connection, such as PPP.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsReachable`

The specified node name or address can be reached using the current network configuration.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsConnectionRequired`

The specified node name or address can be reached using the current network configuration, but a connection must first be established.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsConnectionOnTraffic`

The specified node name or address can be reached using the current network configuration, but a connection must first be established. Any traffic directed to the specified name or address will initiate the connection.

This flag was previously named `kSCNetworkReachabilityFlagsConnectionAutomatic`.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsInterventionRequired`

The specified node name or address can be reached using the current network configuration, but a connection must first be established.

In addition, some form of user intervention will be required to establish this connection, such as providing a password, an authentication token, etc.

Currently, this flag is returned only when there is a dial-on-traffic configuration (`kSCNetworkReachabilityFlagsConnectionOnTraffic`), an attempt to connect has already been made, and when some error (such as no dial tone, no answer, bad password, etc.) occurred during the automatic connection attempt. In this case the PPP controller stops attempting to establish a connection until the user has intervened.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsConnectionOnDemand`

The specified node name or address can be reached using the current network configuration, but a connection must first be established. The connection will be established "On Demand" by the `CFSocketStream` programming interface (see *CFStream Socket Additions* for information on this). Other functions will not establish the connection.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsIsLocalAddress`

The specified node name or address is one that is associated with a network interface on the current system.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

`kSCNetworkReachabilityFlagsIsDirect`

Network traffic to the specified node name or address will not go through a gateway, but is routed directly to one of the interfaces in the system.

Available in Mac OS X v10.6 and later.

Declared in `SCNetworkReachability.h`.

Document Revision History

This table describes the changes to *SCNetworkReachability Reference*.

Date	Notes
2010-03-24	Added the <code>SCNetworkReachabilitySetDispatchQueue</code> function.
2009-06-26	Made minor corrections.
2009-03-05	Updated for iOS 3.0.

REVISION HISTORY

Document Revision History