
NSTask Class Reference

Data Management: Event Handling



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NSTask Class Reference

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|----------------------------|--|
| Inherits from | NSObject |
| Conforms to | NSObject (NSObject) |
| Framework | /System/Library/Frameworks/Foundation.framework |
| Availability | Available in Mac OS X v10.0 and later. |
| Companion guide | Interacting with the Operating System |
| Declared in | NSTask.h |
| Related sample code | FinalCutPro_AppleEvents Moriarity MP3 Player |

Overview

Using the `NSTask` class, your program can run another program as a subprocess and can monitor that program's execution. An `NSTask` object creates a separate executable entity; it differs from `NSThread` in that it does not share memory space with the process that creates it.

A task operates within an environment defined by the current values for several items: the current directory, standard input, standard output, standard error, and the values of any environment variables. By default, an `NSTask` object inherits its environment from the process that launches it. If there are any values that should be different for the task, for example, if the current directory should change, you must change the value before you launch the task. A task's environment cannot be changed while it is running.

An `NSTask` object can only be run once. Subsequent attempts to run the task raise an error.

Tasks

Creating and Initializing an NSTask Object

- + `launchedTaskWithLaunchPath:arguments:` (page 7)
Creates and launches a task with a specified executable and arguments.
- `init` (page 9)
Returns an initialized `NSTask` object with the environment of the current process.

Returning Task Information

- [arguments](#) (page 8)
Returns the arguments used when the receiver was launched.
- [currentDirectoryPath](#) (page 8)
Returns the task's current directory.
- [environment](#) (page 8)
Returns a dictionary of variables for the environment from which the receiver was launched.
- [launchPath](#) (page 10)
Returns the path of the receiver's executable.
- [processIdentifier](#) (page 11)
Returns the receiver's process identifier.
- [standardError](#) (page 15)
Returns the standard error file used by the receiver.
- [standardInput](#) (page 16)
Returns the standard input file used by the receiver.
- [standardOutput](#) (page 16)
Returns the standard output file used by the receiver.

Running and Stopping a Task

- [interrupt](#) (page 9)
Sends an interrupt signal to the receiver and all of its subtasks.
- [launch](#) (page 10)
Launches the task represented by the receiver.
- [resume](#) (page 11)
Resumes execution of the receiver task that had previously been suspended with a [suspend](#) (page 16) message.
- [suspend](#) (page 16)
Suspends execution of the receiver task.
- [terminate](#) (page 17)
Sends a terminate signal to the receiver and all of its subtasks.
- [waitUntilExit](#) (page 18)
Block until the receiver is finished.

Querying the Task State

- [isRunning](#) (page 10)
Returns whether the receiver is still running.
- [terminationStatus](#) (page 18)
Returns the exit status returned by the receiver's executable.
- [terminationReason](#) (page 17)
Returns the reason the task was terminated.

Configuring an NSTask Object

- [setArguments:](#) (page 11)
Sets the command arguments that should be used to launch the executable.
- [setCurrentDirectoryPath:](#) (page 12)
Sets the current directory for the receiver.
- [setEnvironment:](#) (page 12)
Sets the environment for the receiver.
- [setLaunchPath:](#) (page 13)
Sets the receiver's executable.
- [setStandardError:](#) (page 13)
Sets the standard error for the receiver.
- [setStandardInput:](#) (page 14)
Sets the standard input for the receiver.
- [setStandardOutput:](#) (page 15)
Sets the standard output for the receiver.

Class Methods

launchedTaskWithLaunchPath:arguments:

Creates and launches a task with a specified executable and arguments.

```
+ (NSTask *)launchedTaskWithLaunchPath:(NSString *)path arguments:(NSArray *)arguments
```

Parameters

path

The path to the executable.

arguments

An array of `NSString` objects that supplies the arguments to the task. If *arguments* is `nil`, an `NSInvalidArgumentException` is raised.

Discussion

The task inherits its environment from the process that invokes this method.

The `NSTask` object converts both *path* and the strings in *arguments* to appropriate C-style strings (using `fileSystemRepresentation`) before passing them to the task via `argv[]`. The strings in *arguments* do not undergo shell expansion, so you do not need to do special quoting, and shell variables, such as `$PWD`, are not resolved.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [init](#) (page 9)

Declared In
NSTask.h

Instance Methods

arguments

Returns the arguments used when the receiver was launched.

- (NSArray *)arguments

Return Value

An array of NSString objects containing the arguments used when the receiver was launched.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [setArguments:](#) (page 11)

Declared In
NSTask.h

currentDirectoryPath

Returns the task's current directory.

- (NSString *)currentDirectoryPath

Return Value

The task's current working directory.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [setCurrentDirectoryPath:](#) (page 12)

Declared In
NSTask.h

environment

Returns a dictionary of variables for the environment from which the receiver was launched.

- (NSDictionary *)environment

Return Value

A dictionary of variables for the environment from which the receiver was launched. The dictionary keys are the environment variable names.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [setEnvironment:](#) (page 12)
- `environment` (`NSProcessInfo`)

Declared In

`NSTask.h`

init

Returns an initialized `NSTask` object with the environment of the current process.

```
- (id)init
```

Return Value

An initialized `NSTask` object with the environment of the current process.

Discussion

If you need to modify the environment of a task, use `alloc` and `init`, and then set up the environment before launching the new task. Otherwise, just use the class method

[launchedTaskWithLaunchPath:arguments:](#) (page 7) to create and run the task.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSTask.h`

interrupt

Sends an interrupt signal to the receiver and all of its subtasks.

```
- (void)interrupt
```

Discussion

If the task terminates as a result, which is the default behavior, an `NSTaskDidTerminateNotification` (page 19) gets sent to the default notification center. This method has no effect if the receiver was already launched and has already finished executing. If the receiver has not been launched yet, this method raises an `NSInvalidArgumentException`.

It is not always possible to interrupt the receiver because it might be ignoring the interrupt signal. `interrupt` sends `SIGINT`.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSTask.h`

isRunning

Returns whether the receiver is still running.

- (BOOL)isRunning

Return Value

YES if the receiver is still running, otherwise NO. NO means either the receiver could not run or it has terminated.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [launch](#) (page 10)
- [terminate](#) (page 17)
- [waitUntilExit](#) (page 18)

Declared In

NSTask.h

launch

Launches the task represented by the receiver.

- (void)launch

Discussion

Raises an `NSInvalidArgumentException` if the launch path has not been set or is invalid or if it fails to create a process.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [launchPath](#) (page 10)
- [setLaunchPath:](#) (page 13)
- [terminate](#) (page 17)
- [waitUntilExit](#) (page 18)

Related Sample Code

FinalCutPro_AppleEvents

MP3 Player

Declared In

NSTask.h

launchPath

Returns the path of the receiver's executable.

- (NSString *)launchPath

Return Value

The path of the receiver's executable.

Availability

Available in Mac OS X v10.0 and later.

See Also

+ [launchedTaskWithLaunchPath:arguments:](#) (page 7)

- [setLaunchPath:](#) (page 13)

Declared In

NSTask.h

processIdentifier

Returns the receiver's process identifier.

- (int)processIdentifier

Return Value

The receiver's process identifier.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSTask.h

resume

Resumes execution of the receiver task that had previously been suspended with a [suspend](#) (page 16) message.

- (BOOL)resume

Return Value

YES if the receiver was able to resume execution, NO otherwise.

Discussion

If multiple [suspend](#) messages were sent to the receiver, an equal number of [resume](#) messages must be sent before the task resumes execution.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSTask.h

setArguments:

Sets the command arguments that should be used to launch the executable.

```
- (void)setArguments:(NSArray *)arguments
```

Parameters

arguments

An array of NSString objects that supplies the arguments to the task. If *arguments* is nil, an `NSInvalidArgumentException` is raised.

Discussion

The NSTask object converts both *path* and the strings in *arguments* to appropriate C-style strings (using `fileSystemRepresentation`) before passing them to the task via `argv[]`. The strings in *arguments* do not undergo shell expansion, so you do not need to do special quoting, and shell variables, such as `$PWD`, are not resolved.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [arguments](#) (page 8)

Related Sample Code

FinalCutPro_AppleEvents

MP3 Player

Declared In

NSTask.h

setCurrentDirectoryPath:

Sets the current directory for the receiver.

```
- (void)setCurrentDirectoryPath:(NSString *)path
```

Parameters

path

The current directory for the task.

Discussion

If this method isn't used, the current directory is inherited from the process that created the receiver. This method raises an `NSInvalidArgumentException` if the receiver has already been launched.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [currentDirectoryPath](#) (page 8)

Declared In

NSTask.h

setEnvironment:

Sets the environment for the receiver.

- (void)setEnvironment:(NSDictionary *)*environmentDictionary*

Parameters

environmentDictionary

A dictionary of environment variable values whose keys are the variable names.

Discussion

If this method isn't used, the environment is inherited from the process that created the receiver. This method raises an `NSInvalidArgumentException` if the receiver has already been launched.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [environment](#) (page 8)

Related Sample Code

FinalCutPro_AppleEvents

MP3 Player

Declared In

NSTask.h

setLaunchPath:

Sets the receiver's executable.

- (void)setLaunchPath:(NSString *)*path*

Parameters

path

The path to the executable.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [launchPath](#) (page 10)

Related Sample Code

FinalCutPro_AppleEvents

MP3 Player

Declared In

NSTask.h

setStandardError:

Sets the standard error for the receiver.

- (void)setStandardError:(id)*file*

Parameters*file*

The standard error for the receiver, which can be either an `NSFileHandle` or an `NSPipe` object.

Discussion

If *file* is an `NSPipe` object, launching the receiver automatically closes the write end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the write end of the pipe won't be closed automatically.

If this method isn't used, the standard error is inherited from the process that created the receiver. This method raises an `NSInvalidArgumentException` if the receiver has already been launched.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [standardError](#) (page 15)

Declared In

`NSTask.h`

setStandardInput:

Sets the standard input for the receiver.

```
- (void)setStandardInput:(id)file
```

Parameters*file*

The standard input for the receiver, which can be either an `NSFileHandle` or an `NSPipe` object.

Discussion

If *file* is an `NSPipe` object, launching the receiver automatically closes the read end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the read end of the pipe won't be closed automatically.

If this method isn't used, the standard input is inherited from the process that created the receiver. This method raises an `NSInvalidArgumentException` if the receiver has already been launched.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [standardInput](#) (page 16)

Related Sample Code

`FinalCutPro_AppleEvents`

Declared In

`NSTask.h`

setStandardOutput:

Sets the standard output for the receiver.

- (void)setStandardOutput:(id)file

Parameters

file

The standard output for the receiver, which can be either an `NSFileHandle` or an `NSPipe` object.

Discussion

If *file* is an `NSPipe` object, launching the receiver automatically closes the write end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the write end of the pipe won't be closed automatically.

If this method isn't used, the standard output is inherited from the process that created the receiver. This method raises an `NSInvalidArgumentException` if the receiver has already been launched.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [standardOutput](#) (page 16)

Related Sample Code

FinalCutPro_AppleEvents

Declared In

NSTask.h

standardError

Returns the standard error file used by the receiver.

- (id)standardError

Return Value

The standard error file used by the receiver.

Discussion

Standard error is where all diagnostic messages are sent. The object returned is either an `NSFileHandle` or an `NSPipe` instance, depending on what type of object was passed to [setStandardError:](#) (page 13).

Availability

Available in Mac OS X v10.0 and later.

See Also

- [setStandardError:](#) (page 13)

Declared In

NSTask.h

standardInput

Returns the standard input file used by the receiver.

- (id)standardInput

Return Value

The standard input file used by the receiver.

Discussion

Standard input is where the receiver takes its input from unless otherwise specified. The object returned is either an `NSFileHandle` or an `NSPipe` instance, depending on what type of object was passed to the [setStandardInput: \(page 14\)](#) method.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [setStandardInput: \(page 14\)](#)

Declared In

NSTask.h

standardOutput

Returns the standard output file used by the receiver.

- (id)standardOutput

Return Value

The standard output file used by the receiver.

Discussion

Standard output is where the receiver displays its output. The object returned is either an `NSFileHandle` or an `NSPipe` instance, depending on what type of object was passed to the [setStandardOutput: \(page 15\)](#) method.

Availability

Available in Mac OS X v10.0 and later.

See Also

- [setStandardOutput: \(page 15\)](#)

Declared In

NSTask.h

suspend

Suspends execution of the receiver task.

- (BOOL)suspend

Return Value

YES if the receiver was successfully suspended, NO otherwise.

Discussion

Multiple `suspend` messages can be sent, but they must be balanced with an equal number of `resume` (page 11) messages before the task resumes execution.

Availability

Available in Mac OS X v10.0 and later.

Declared In

`NSTask.h`

terminate

Sends a terminate signal to the receiver and all of its subtasks.

- (void)terminate

Discussion

If the task terminates as a result, which is the default behavior, an `NSTaskDidTerminateNotification` (page 19) gets sent to the default notification center. This method has no effect if the receiver was already launched and has already finished executing. If the receiver has not been launched yet, this method raises an `NSInvalidArgumentException`.

It is not always possible to terminate the receiver because it might be ignoring the terminate signal. `terminate` sends `SIGTERM`.

Availability

Available in Mac OS X v10.0 and later.

See Also

- + [launchedTaskWithLaunchPath:arguments:](#) (page 7)
- [launch](#) (page 10)
- [terminationStatus](#) (page 18)
- [waitUntilExit](#) (page 18)

Related Sample Code

FinalCutPro_AppleEvents

MP3 Player

Declared In

`NSTask.h`

terminationReason

Returns the reason the task was terminated.

- (NSTaskTerminationReason)terminationReason

Return Value

The termination status. The possible values are described in “[NSTaskTerminationReason](#)” (page 19).

Availability

Available in Mac OS X v10.6 and later.

Declared In

NSTask.h

terminationStatus

Returns the exit status returned by the receiver's executable.

```
- (int)terminationStatus
```

Return Value

The exit status returned by the receiver's executable.

Discussion

Each task defines and documents how its return value should be interpreted. For example, many commands return 0 if they complete successfully or an error code if they don't. You'll need to look at the documentation for that task to learn what values it returns under what circumstances.

This method raises an `NSInvalidArgumentException` if the receiver is still running. Verify that the receiver is not running before you use it.

```
if (![aTask isRunning]) {
    int status = [aTask terminationStatus];
    if (status == ATASK_SUCCESS_VALUE)
        NSLog(@"Task succeeded.");
    else
        NSLog(@"Task failed.");
}
```

Availability

Available in Mac OS X v10.0 and later.

See Also

- [terminate](#) (page 17)
- [waitUntilExit](#) (page 18)

Declared In

NSTask.h

waitUntilExit

Block until the receiver is finished.

```
- (void)waitUntilExit
```

Discussion

This method first checks to see if the receiver is still running using [isRunning](#) (page 10). Then it polls the current run loop using `NSDefaultRunLoopMode` until the task completes.

```
[aTask launch];
[aTask waitUntilExit];
int status = [aTask terminationStatus];

if (status == ATASK_SUCCESS_VALUE)
    NSLog(@"Task succeeded.");
```

```
else
    NSLog(@"Task failed.");
```

Availability

Available in Mac OS X v10.0 and later.

See Also

- [launch](#) (page 10)
- [terminate](#) (page 17)

Declared In

NSTask.h

Constants

NSTaskTerminationReason

These constants specify the values that are returned by [terminationReason](#) (page 17).

```
enum {
    NSTaskTerminationReasonExit = 1,
    NSTaskTerminationReasonUncaughtSignal = 2
};
typedef NSInteger NSTaskTerminationReason;
```

Constants

NSTaskTerminationReasonExit

The task exited normally.

Available in Mac OS X v10.6 and later.

Declared in NSTask.h.

NSTaskTerminationReasonUncaughtSignal

The task exited due to an uncaught signal.

Available in Mac OS X v10.6 and later.

Declared in NSTask.h.

Notifications

NSTaskDidTerminateNotification

Posted when the task has stopped execution. This notification can be posted either when the task has exited normally or as a result of [terminate](#) (page 17) being sent to the NSTask object. If the NSTask object gets released, however, this notification will not get sent, as the port the message would have been sent on was released as part of the task release. The observer method can use [terminationStatus](#) (page 18) to determine why the task died. See “Ending an NSTask” for an example.

The notification object is the NSTask object that was terminated. This notification does not contain a *userInfo* dictionary.

Availability

Available in Mac OS X v10.0 and later.

Declared In

NSTask.h

Document Revision History

This table describes the changes to *NSTask Class Reference*.

| Date | Notes |
|------------|---|
| 2009-08-14 | Updated for Mac OS X v 10.6. Added terminationReason method and related constants. |
| 2007-01-31 | Corrected the description for the setStandardInput: method. Updated for Mac OS X v10.5. |
| 2006-05-23 | First publication of this content as a separate document. |

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