
NSOutlineViewDataSource Protocol Reference

User Experience: Data Presentation



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NSOutlineViewDataSource Protocol Reference

Conforms to	NSObject
Framework	/System/Library/Frameworks/AppKit.framework
Availability	Available in Mac OS X v10.6 and later.
Companion guide	Outline View Programming Topics for Cocoa
Declared in	NSOutlineView.h

Overview

NSOutlineView objects support a data source delegate in addition to the regular delegate object. The NSOutlineViewDataSource protocol defines methods that the outline view invokes as necessary to retrieve data and information about the data from the data source delegate, and—optionally—to update data values.

The outlineview’s delegate that conforms to the NSOutlineViewDelegate Protocol protocol handles all other delegate responsibilities for the outline view.

All the methods in the NSOutlineViewDataSource protocol are marked as `@optional`. While this is true, there are cases where you must implement some methods to achieve required functionality, specifically when working with conventional data sources rather than data that is provided by Cocoa bindings.

Required Method and @optional Directives When Using Cocoa Bindings

For example, if you are using conventional data sources for content you must implement the basic methods that provide the outline view with data: `outlineView:child:ofItem:` (page 7), `outlineView:isItemExpandable:` (page 8), `outlineView:numberOfChildrenOfItem:` (page 10), and `outlineView:objectValueForTableColumn:byItem:` (page 11). Applications that acquire their data using Cocoa bindings do not need to implement these methods.

Similarly, when using conventional data sources, if you want to allow the user to edit values, you must implement `outlineView:objectValueForTableColumn:byItem:` (page 11). When these methods are invoked by the table view, `nil` as the `item` refers to the “root” item. NSOutlineView requires that each item in the outline view be unique. In order for the collapsed state of an outline view to remain consistent between reloads you must always return the same object for an item. When using Cocoa bindings to provide outlineview content, there is no requirement to implement this method.

Note: Some of the methods in this protocol, such as `outlineView:child:ofItem:` (page 7) and `outlineView:numberOfChildrenOfItem:` (page 10) along with other methods that return data, are called very frequently, so they must be efficient.

Tasks

Working with Items in a View

- `outlineView:child:ofItem:` (page 7)
Returns the child item at the specified index of a given item.
- `outlineView:isItemExpandable:` (page 8)
Returns a Boolean value that indicates whether the a given item is expandable.
- `outlineView:numberOfChildrenOfItem:` (page 10)
Returns the number of child items encompassed by a given item.
- `outlineView:objectValueForTableColumn:byItem:` (page 11)
Invoked by `outlineView` to return the data object associated with the specified *item*.
- `outlineView:setObjectValue:forTableColumn:byItem:` (page 12)
Set the data object for a given item in a given column.

Supporting Drag and Drop

- `outlineView:acceptDrop:item:childIndex:` (page 7)
Returns a Boolean value that indicates whether a drop operation was successful.
- `outlineView:validateDrop:proposedItem:proposedChildIndex:` (page 13)
Used by an outline view to determine a valid drop target.
- `outlineView:namesOfPromisedFilesDroppedAtDestination:forDraggedItems:` (page 9)
Returns an array of filenames for the created files that the receiver promises to create.

Supporting Object Persistence

- `outlineView:itemForPersistentObject:` (page 9)
Invoked by `outlineView` to return the item for the archived *object*.
- `outlineView:persistentObjectForItem:` (page 11)
Invoked by `outlineView` to return an archived object for *item*.

Working with a Pasteboard

- `outlineView:writeItems:toPasteboard:` (page 14)
Returns a Boolean value that indicates whether a drag operation is allowed.

Sorting

- [outlineView:sortDescriptorsDidChange:](#) (page 12)

Invoked by an outline view to notify the data source that the descriptors changed and the data may need to be resorted.

Instance Methods

outlineView:acceptDrop:item:childIndex:

Returns a Boolean value that indicates whether a drop operation was successful.

```
- (BOOL)outlineView:(NSOutlineView *)outlineView acceptDrop:(id < NSDraggingInfo
 >)info item:(id)item childIndex:(NSInteger)index
```

Parameters

outlineView

The outline view that sent the message. *outlineView* must have previously allowed a drop.

info

An object that contains more information about this dragging operation.

item

The parent of the item over which the cursor was placed when the mouse button was released.

index

The index of the child of *item* over which the cursor was placed when the mouse button was released.

Return Value

YES if the drop operation was successful, otherwise NO.

Discussion

The data source should incorporate the data from the dragging pasteboard in the implementation of this method. You can get the data for the drop operation from *info* using the `draggingPasteboard` method.

The return value indicates success or failure of the drag operation to the system.

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

See Also

- `shouldCollapseAutoExpandedItemsForDeposited:` (NSOutlineView)

Declared In

NSOutlineView.h

outlineView:child:ofItem:

Returns the child item at the specified index of a given item.

```
- (id)outlineView:(NSOutlineView *)outlineView child:(NSInteger)index ofItem:(id)item
```

Parameters*outlineView*

The outline view that sent the message.

*index*The index of the child item from *item* to return.*item*

An item in the data source.

Return ValueThe child item at *index* of a *item*. If *item* is `nil`, returns the appropriate child item of the root object.**Discussion**

Children of a given parent *item* are accessed sequentially. In order for the collapsed state of the outline view to remain consistent when it is reloaded you must always return the same object for a specified *child* and *item*.

Important: While this method is marked as `@optional` in the protocol, **you must implement this method if you are not providing the data for the outline view using using Cocoa bindings**

Special Considerations

[outlineView:child:ofItem:](#) (page 7) is called very frequently, so it must be efficient.

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

See Also

- [outlineView:numberOfChildrenOfItem:](#) (page 10)

Declared In

NSOutlineView.h

outlineView:isItemExpandable:

Returns a Boolean value that indicates whether the a given item is expandable.

```
- (BOOL)outlineView:(NSOutlineView *)outlineView isItemExpandable:(id)item
```

Parameters*outlineView*

The outline view that sent the message.

item

An item in the data source.

Return ValueYES if *item* can be expanded to display its children, otherwise NO.**Discussion**

This method may be called quite often and should be efficient.

Important: While this method is marked as `@optional` in the protocol, **you must implement this method if you are not providing the data for the outline view using using Cocoa bindings**

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:itemForPersistentObject:

Invoked by *outlineView* to return the item for the archived *object*.

```
- (id)outlineView:(NSOutlineView *)outlineView itemForPersistentObject:(id)object
```

Parameters

outlineView

The outline view that sent the message.

object

An archived representation of an item in *outlineView's* data source.

Return Value

The unarchived item corresponding to *object*. If the item is an archived object, this method may return the object.

Discussion

When the outline view is restoring the saved expanded items, this method is called for each expanded item, to translate the archived object to an outline view item.

Special Considerations

You must implement this method if you are automatically saving expanded items (that is, if `autosaveExpandedItems` returns YES).

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:namesOfPromisedFilesDroppedAtDestination:forDraggedItems:

Returns an array of filenames for the created files that the receiver promises to create.

```
- (NSArray *)outlineView:(NSOutlineView *)outlineView
  namesOfPromisedFilesDroppedAtDestination:(NSURL *)dropDestination
  forDraggedItems:(NSArray *)items
```

Parameters*outlineView*

The outline view that sent the message.

dropDestination

The drop location where the files are created.

items

The items being dragged.

Return Value

An array of filenames (not full paths) for the created files that the receiver promises to create.

DiscussionFor more information on file promise dragging, see documentation on the `NSDraggingSource` protocol and `namesOfPromisedFilesDroppedAtDestination:`.**Availability**

Available in Mac OS X v10.4 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:numberOfChildrenOfItem:

Returns the number of child items encompassed by a given item.

- (NSInteger)outlineView:(NSOutlineView *)outlineView numberOfChildrenOfItem:(id)item

Parameters*outlineView*

The outline view that sent the message.

item

An item in the data source.

Return ValueThe number of child items encompassed by *item*. If *item* is `nil`, this method should return the number of children for the top-level item.**Discussion**[outlineView:numberOfChildrenOfItem:](#) (page 10) is called very frequently, so it must be efficient.**Important:** While this method is marked as `@optional` in the protocol, you must implement this method if you are not providing the data for the outline view using using Cocoa bindings**Availability**

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:objectValueForTableColumn:byItem:

Invoked by *outlineView* to return the data object associated with the specified *item*.

```
- (id)outlineView:(NSOutlineView *)outlineView
  objectValueForTableColumn:(NSTableColumn *)tableColumn byItem:(id)item
```

Parameters

outlineView

The outline view that sent the message.

tableColumn

A column in *outlineView*.

item

An item in the data source in the specified *tableColumn* of the view.

Discussion

The item is located in the specified *tableColumn* of the view.

NSOutlineView requires that each item in the outline view be unique. In order for the collapsed state of the outline view to remain consistent when it is reloaded you must always return the same object for the specified *item*.

Important: While this method is marked as `@optional` in the protocol, you must implement this method if you are not providing the data for the outline view using using Cocoa bindings

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:persistentObjectForItem:

Invoked by *outlineView* to return an archived object for *item*.

```
- (id)outlineView:(NSOutlineView *)outlineView persistentObjectForItem:(id)item
```

Parameters

outlineView

The outline view that sent the message.

item

The item for which to return an archived object.

Return Value

An archived representation of *item*. If the item is an archived object, this method may return the item.

Discussion

When the outline view is saving the expanded items, this method is called for each expanded item, to translate the outline view item to an archived object.

Special Considerations

You must implement this method if you are automatically saving expanded items (that is, if `autosaveExpandedItems` returns YES).

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:setObjectValue:forTableColumn:byItem:

Set the data object for a given item in a given column.

```
- (void)outlineView:(NSOutlineView *)outlineView setObjectValue:(id)object
  forTableColumn:(NSTableColumn *)tableColumn byItem:(id)item
```

Parameters

outlineView

The outline view that sent the message.

object

The new value for the item.

tableColumn

A column in *outlineView*.

item

An item in the data source in the specified *tableColumn* of the view.

Discussion

The item is located in the specified *tableColumn* of the view.

Important: While this method is marked as `@optional` in the protocol, **you must implement this method if you are not providing the data for the outline view using using Cocoa bindings**

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:sortDescriptorsDidChange:

Invoked by an outline view to notify the data source that the descriptors changed and the data may need to be resorted.

```
- (void)outlineView:(NSOutlineView *)outlineView sortDescriptorsDidChange:(NSArray
  *)oldDescriptors
```

Parameters*outlineView*

The outline view that sent the message.

oldDescriptors

An array that contains the previous descriptors.

Discussion

The data source typically sorts and reloads the data, and adjusts the selections accordingly. If you need to know the current sort descriptors and the data source does not itself manage them, you can get *outlineView*'s current sort descriptors by sending it a `sortDescriptors` message.

Availability

Available in Mac OS X v10.3 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:validateDrop:proposedItem:proposedChildIndex:

Used by an outline view to determine a valid drop target.

```
- (NSDragOperation)outlineView:(NSOutlineView *)outlineView validateDrop:(id <
    NSDraggingInfo >)info proposedItem:(id)item proposedChildIndex:(NSInteger)index
```

Parameters*outlineView*

The outline view that sent the message.

info

An object that contains more information about this dragging operation.

item

The proposed parent.

index

The proposed child location.

Return Value

A value that indicates which dragging operation the data source will perform.

Discussion

Based on the mouse position, the outline view will suggest a proposed drop location. The data source may “retarget” a drop if desired by calling `setDropItem:dropChildIndex:` and returning something other than `NSDragOperationNone`. You may choose to retarget for various reasons (for example, for better visual feedback when inserting into a sorted position).

Implementation of this method is optional.

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

outlineView:writeItems:toPasteboard:

Returns a Boolean value that indicates whether a drag operation is allowed.

```
- (BOOL)outlineView:(NSOutlineView *)outlineView writeItems:(NSArray *)items
toPasteboard:(NSPasteboard *)pboard
```

Parameters

outlineView

The outline view that invoked the method.

items

An array of the items participating in the drag.

pboard

The pasteboard to which to write the drag data.

Return Value

YES if the drag operation is allowed, otherwise NO.

Discussion

Invoked by *outlineView* after it has been determined that a drag should begin, but before the drag has been started.

To refuse the drag, return NO. To start a drag, return YES and place the drag data onto the *pboard* (data, owner, and so on). The drag image and other drag-related information will be set up and provided by the outline view once this call returns with YES.

Availability

Available in Mac OS X v10.0 and later.

Available as part of an informal protocol prior to Mac OS X v10.6.

Declared In

NSOutlineView.h

Document Revision History

This table describes the changes to *NSOutlineViewDataSource Protocol Reference*.

Date	Notes
2009-04-27	Updated for Mac OS X v10.6. The NSOutlineViewDataSource informal protocol is now a formal protocol.
2007-02-19	Corrected minor typographical errors.
2006-05-23	Clarified that <code>outlineView:objectValueForTableColumn:item:</code> must return the same object for a requested item to maintain the collapsed state between reloads.
	First publication of this content as a separate document.

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 method 7**

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