

Using iCloud with NSDocument

Session 224

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Software Engineer, Cocoa Frameworks

These are confidential sessions—please refrain from streaming, blogging, or taking pictures





Cloud







NSDocument





NSDocument



File Coordination



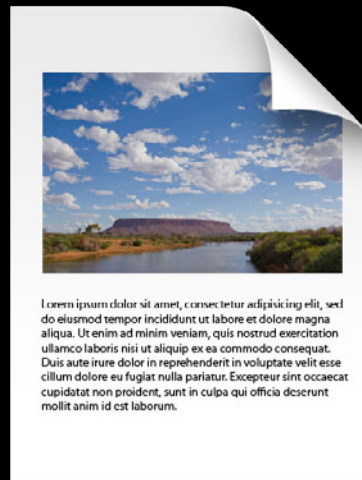
NSDocument



File Coordination Document Management



NSDocument



File Coordination
Document Management
Conflict Resolution



NSDocument



File Coordination
Document Management
Conflict Resolution
Alerts



iCloud

Adoption

Mechanics

Best Practices

Provisioning Profile



Provisioning Profile

- Identifies your development team



Provisioning Profile

- Identifies your development team
- Defines the devices your App can run on



Provisioning Profile

- Identifies your development team
- Defines the devices your App can run on
- Grants iCloud support



Provisioning Profile

- Identifies your development team
- Defines the devices your App can run on
- Grants iCloud support
- Defines your Ubiquity container

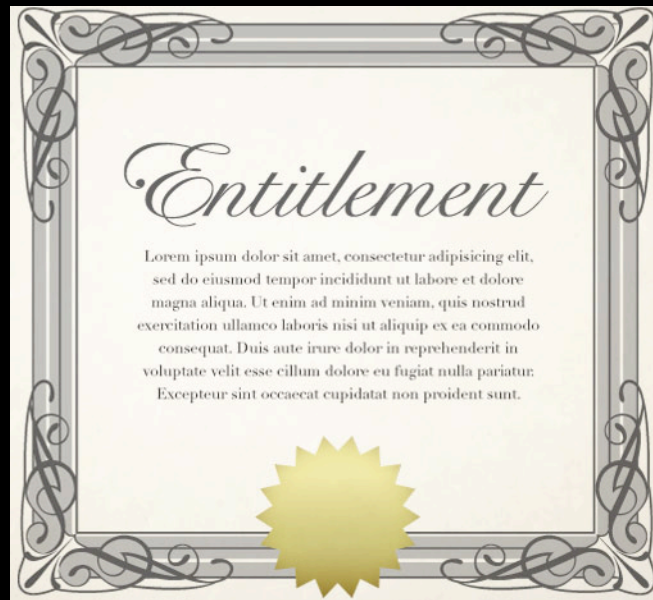


Provisioning Profile

- Identifies your development team
- Defines the devices your App can run on
- Grants iCloud support
- Defines your Ubiquity container
- Provisioning Portal



Get Entitled



Demo



iCloud

Adoption
Mechanics
Best Practices



Auto Save

Adoption
Responsiveness
Serialization
Versions



iCloud

Adoption
Mechanics
Best Practices



Auto Save

Adoption

Responsiveness

Serialization

Versions



iCloud

Adoption

Mechanics

Best Practices

Why Adopt Auto Save?

Why Adopt Auto Save?

- Modern document workflow

Why Adopt Auto Save?

- Modern document workflow
- Versions

Why Adopt Auto Save?

- Modern document workflow
- Versions
- Automatic Termination and Resume

Why Adopt Auto Save?

- Modern document workflow
- Versions
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- iCloud

Why Adopt Auto Save?

- Modern document workflow
- Versions
- Automatic Termination and Resume
- iCloud
- File Coordination

Enable Auto Save

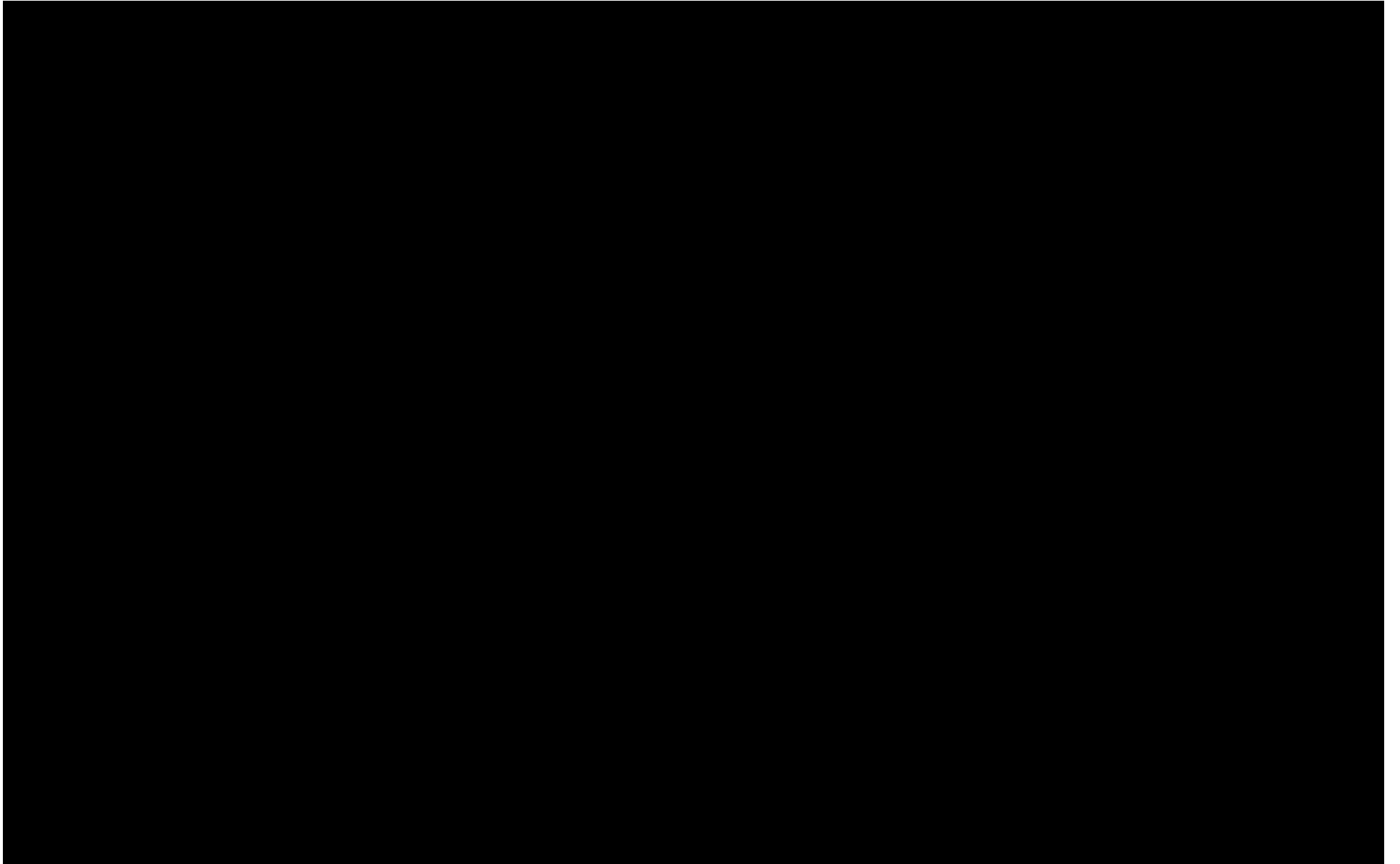
Enable Auto Save

```
+ (BOOL)autosavesInPlace {  
    return YES;  
}
```

Enable Auto Save

```
+ (BOOL)autosavesInPlace {  
    return YES;  
}
```

NSAutosaveElsewhereOperation
NSAutosaveInPlaceOperation



User Initiated

Save In Place

"Save" — NSSaveOperation

NSSaveOperation

User Initiated

Save In Place

“Save” — NSSaveOperation

NSSaveOperation



My Document

User Initiated

Save In Place

“Save” — NSSaveOperation

NSSaveOperation



My Document

User Initiated

Save In Place

“Save” — NSSaveOperation

Save Elsewhere

“Export” — NSSaveToOperation

NSSaveToOperation



My Document

User Initiated

Save In Place

“Save” — NSSaveOperation

Save Elsewhere

“Export” — NSSaveToOperation

NSSaveToOperation



My Document



Another Document

User Initiated

Save In Place

“Save” — NSSaveOperation

Save Elsewhere

“Export” — NSSaveToOperation

Save Elsewhere & Redirect

“Save As” — NSSaveAsOperation

NSSaveAsOperation



My Document

User Initiated

Save In Place

“Save” — NSSaveOperation

Save Elsewhere

“Export” — NSSaveToOperation

Save Elsewhere & Redirect

“Save As” — NSSaveAsOperation

NSSaveAsOperation



>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

My Document



>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

My Document 2

User Initiated

Save In Place

“Save” — NSSaveOperation

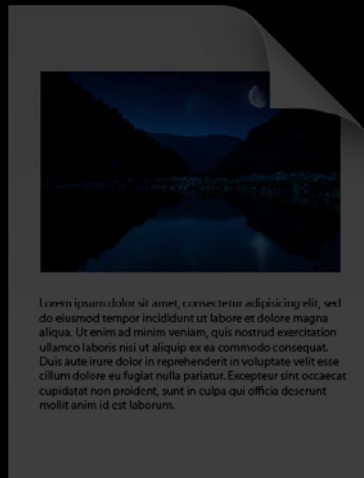
Save Elsewhere

“Export” — NSSaveToOperation

Save Elsewhere & Redirect

“Save As” — NSSaveAsOperation

NSSaveAsOperation



My Document



My Document 2

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveElsewhereOperation

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveElsewhereOperation



Untitled

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveElsewhereOperation



Untitled



Autosaved Document

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveElsewhereOperation



My Document



Autosaved Document

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveElsewhereOperation



My Document

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveInPlaceOperation



My Document

	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	

NSAutosaveInPlaceOperation



My Document

Demo



Auto Save

Adoption
Responsiveness
Serialization
Versions



iCloud

Adoption
Mechanics
Best Practices

Auto Save Responsiveness

"Cancellable" — matches spelling used
in code Do not correct

Auto Save Responsiveness

- Asynchronous saving

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Auto Save Responsiveness

- Asynchronous saving
- Cancellable autosaves

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- See “Auto Save and Versions in Mac OS X 10.7 Lion”

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Auto Save Responsiveness

- Asynchronous saving
- Cancellable autosaves
- See “Auto Save and Versions in Mac OS X 10.7 Lion”
 - developer.apple.com/videos

"Cancellable" — matches spelling used
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Auto Save

Adoption
Responsiveness
Serialization
Versions



iCloud

Adoption
Mechanics
Best Practices

Serialized Resources

Serialized Resources

User Activities



Serialized Resources

User Activities



File Access



Serialized Resources

User Activities



Serialized Resources

User Activities



Save
Revert
Duplicate
Print

Serialized Resources



User Activities



Save
Revert
Duplicate
Print

Move
Rename
iCloud conflict
resolution

Serializing User Activity

Serializing User Activity

Show UI

Serializing User Activity

Show UI

Perform

Serializing User Activity

Show UI

Perform

Present Errors

Serializing User Activity

Show UI

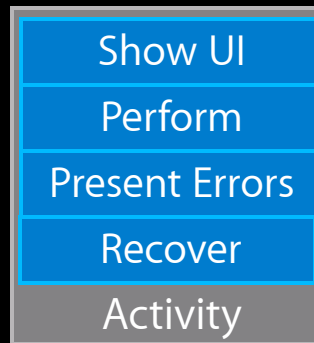
Perform

Present Errors

Recover

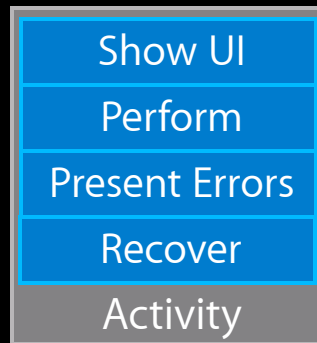
Serializing User Activity

Print



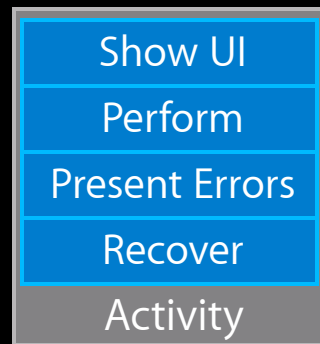
Serializing User Activity

Print

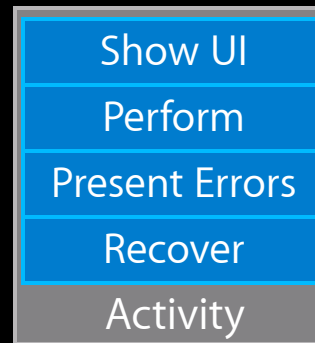


Serializing User Activity

Print



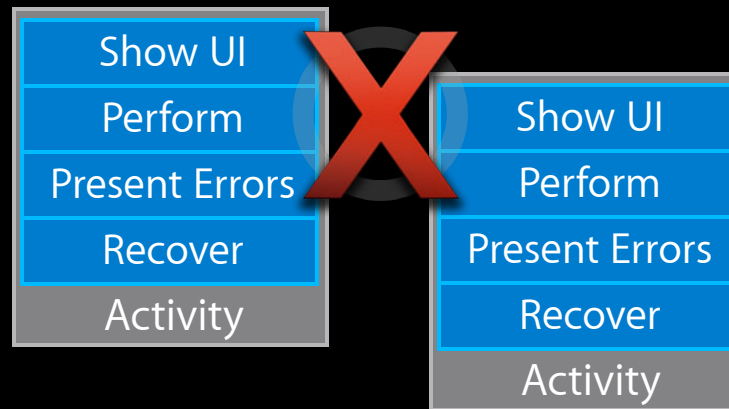
Conflict Resolution



Serializing User Activity

Print

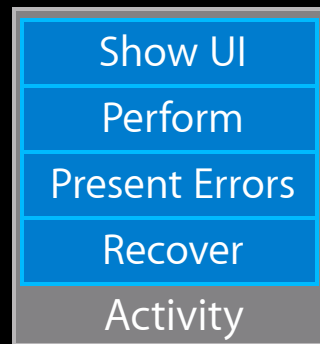
Conflict Resolution



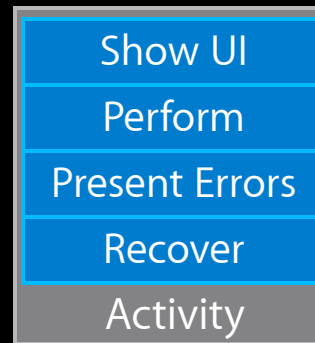
Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

Print



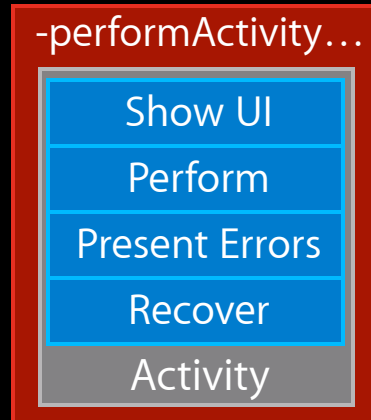
Conflict Resolution



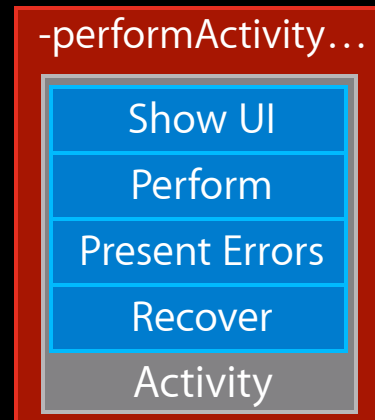
Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

Print

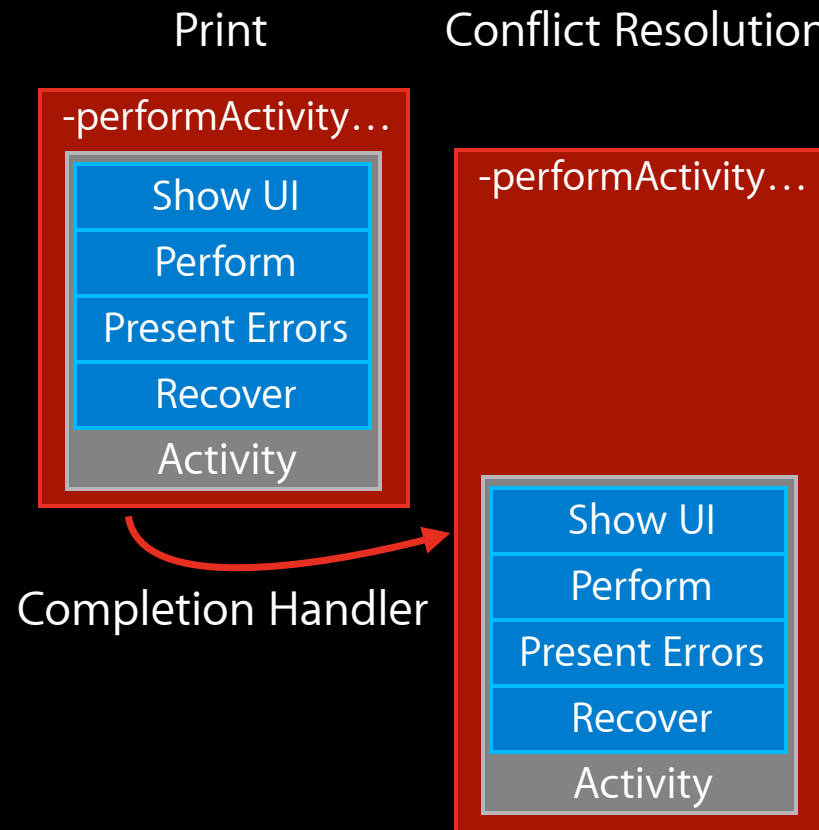


Conflict Resolution



Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

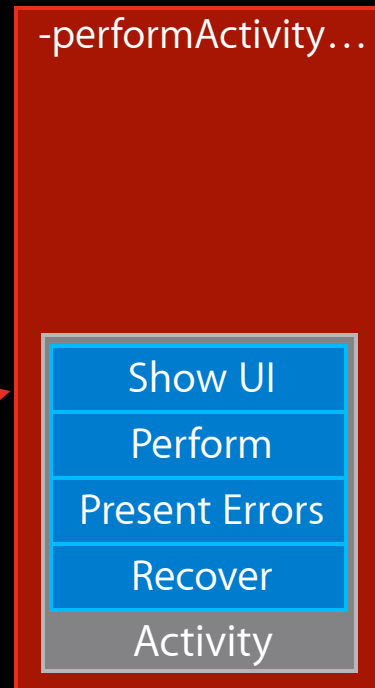
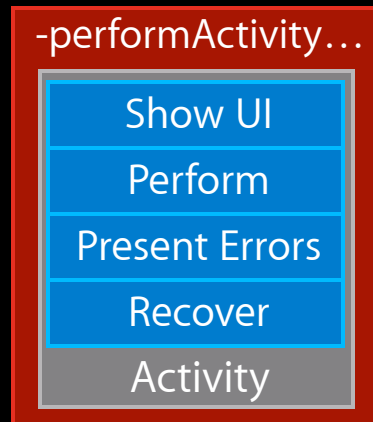


Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

Print

Conflict Resolution



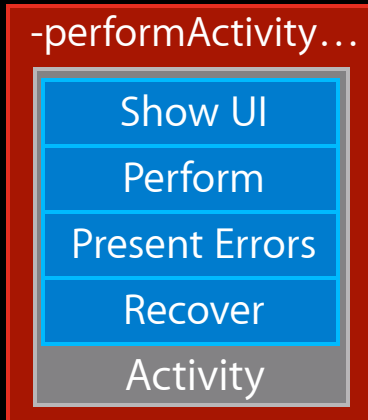
Completion Handler



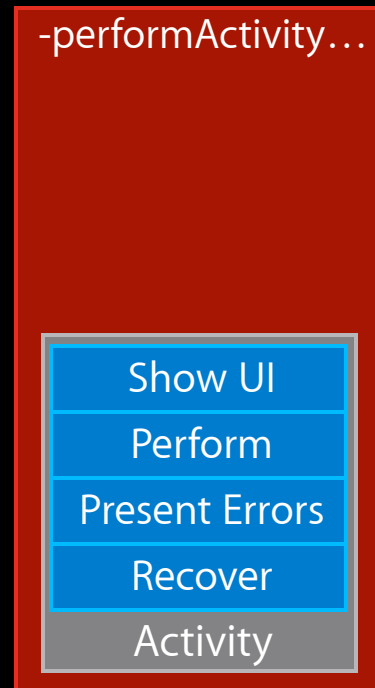
Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

Print



Conflict Resolution



Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

Print

Conflict Resolution

-performActivity...

Show UI

Perform

Present Errors

Recover

Activity

-performActivity...

Serializing User Activity

-performActivityWithSynchronousWaiting:usingBlock:

Print

-performActivity...

Show UI

Perform

Present Errors

Recover

Activity

Conflict Resolution

-performActivity...



Demo

Serialized Resources

File Access



URL
Modification date
On-disk contents
Edit state

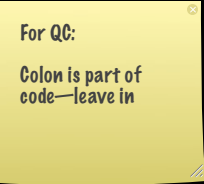
File Access

For QC:

Colon is part of
code—leave in

File Access

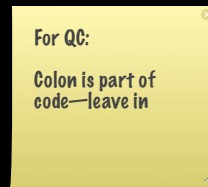
- Two types

A yellow sticky note with a small 'x' icon in the top right corner and a folded bottom-right corner. It contains the following text:

For QC:
Colon is part of
code—leave in

File Access

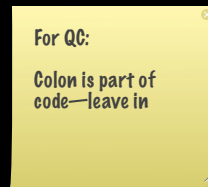
- Two types
 - Synchronous

A yellow sticky note with a small 'x' icon in the top right corner and a folded bottom-right corner. It contains the text: "For QC: Colon is part of code—leave in".

For QC:
Colon is part of
code—leave in

File Access

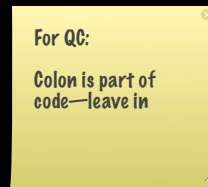
- Two types
 - Synchronous
 - Blocks main thread

A yellow sticky note with a small 'x' icon in the top right corner and a folded bottom-right corner. It contains the text: "For QC: Colon is part of code—leave in".

For QC:
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File Access

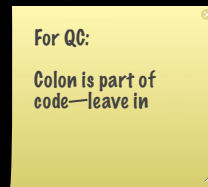
- Two types
 - Synchronous
 - Blocks main thread
 - Invoked synchronously

A yellow sticky note with a small 'x' icon in the top right corner. The text on the note is: "For QC:
Colon is part of
code—leave in".

For QC:
Colon is part of
code—leave in

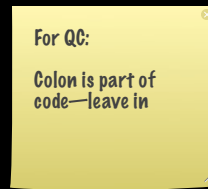
File Access

- Two types
 - Synchronous
 - Blocks main thread
 - Invoked synchronously
 - File access completes on return



File Access

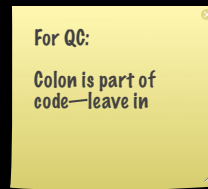
- Two types
 - Synchronous
 - Blocks main thread
 - Invoked synchronously
 - File access completes on return
 - Asynchronous



For QC:
Colon is part of
code—leave in

File Access

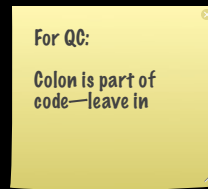
- Two types
 - Synchronous
 - Blocks main thread
 - Invoked synchronously
 - File access completes on return
 - Asynchronous
 - Enqueues block, return immediately



For QC:
Colon is part of
code—leave in

File Access

- Two types
 - Synchronous
 - Blocks main thread
 - Invoked synchronously
 - File access completes on return
 - Asynchronous
 - Enqueues block, return immediately
 - Required to work safely with document on non-main thread

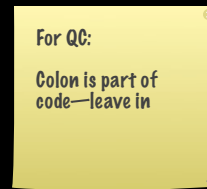


File Access

- Two types

- Synchronous

- Blocks main thread
 - Invoked synchronously
 - File access completes on return



- Asynchronous

- Enqueues block, return immediately
 - Required to work safely with document on non-main thread
 - Resume on main thread using
-`continueAsynchronousWorkOnMainThreadUsingBlock:`

Serialization

Serialization

- Debugging
 - Hangs
 - Blocks never executing

Serialization



- Debugging
 - Hangs
 - Blocks never executing
- `_NSDocumentSerializationInfo()`

```
(lldb) bt
```

```
***
```

```
-[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
-[NSDocument _checkAutosavingThenContinue:]
```

```
***
```

```
(lldb) bt
```

```
  .  
  .  
  .  
-[NSDocument performSynchronousFileAccessUsingBlock:]  
-[NSDocument _checkAutosavingThenContinue:]
```

```
  .  
  .  
(lldb) po _NSDocumentSerializationInfo()
```

```
(lldb) bt
```

```
...
```

```
-[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
-[NSDocument _checkAutosavingThenContinue:]
```

```
...
```

```
(lldb) po _NSDocumentSerializationInfo()
```

```
Pending serialization requests (3 total)
```

```
[0] FILE ACCESS: Document: "Untitled.sketch2" -- State: ACTIVE
```

```
1   -[NSDocument performAsynchronousFileAccessUsingBlock:]
```

```
2   -[SKTDocument doSomethingWithFile]
```

```
...
```

```
[1] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1   -[NSDocument performAsynchronousFileAccessUsingBlock:]
```

```
2   -[NSDocument autosaveWithImplicitCancellability:completionHandler:]
```

```
...
```

```
[2] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1   -[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
2   -[NSDocument _checkAutosavingThenContinue:]
```

```
...
```



```
(lldb) bt
```

```
...
```

```
-[NSDocument performSynchronousFileAccessUsingBlock:]
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```

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(lldb) po _NSDocumentSerializationInfo()
```

```
Pending serialization requests (3 total)
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```
...
```

```
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```

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```
2   -[NSDocument autosaveWithImplicitCancellability:completionHandler:]
```

```
...
```

```
[2] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1   -[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
2   -[NSDocument _checkAutosavingThenContinue:]
```

```
...
```

```
(lldb) bt
```

```
...
```

```
-[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
-[NSDocument _checkAutosavingThenContinue:]
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```
...
```

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Pending serialization requests (3 total)
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1  -[NSDocument performSynchronousFileAccessUsingBlock:]
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```

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Pending serialization requests (3 total)
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```
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...
```

```
[1] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1   -[NSDocument performAsynchronousFileAccessUsingBlock:]
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```
2   -[NSDocument autosaveWithImplicitCancellability:completionHandler:]
```

```
...
```

```
[2] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1   -[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
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```
...
```

```
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```

```
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(lldb) po _NSDocumentSerializationInfo()
```

```
Pending serialization requests (3 total)
```

```
[0] FILE ACCESS: Document: "Untitled.sketch2" -- State: ACTIVE
```

```
1 -[NSDocument performAsynchronousFileAccessUsingBlock:]
```

```
2 -[SKTDocument doSomethingWithFile]
```

```
...
```

```
[1] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1 -[NSDocument performAsynchronousFileAccessUsingBlock:]
```

```
2 -[NSDocument autosaveWithImplicitCancellability:completionHandler:]
```

```
...
```

```
[2] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
```

```
1 -[NSDocument performSynchronousFileAccessUsingBlock:]
```

```
2 -[NSDocument _checkAutosavingThenContinue:]
```

```
...
```

```
(lldb) bt
...
-[NSDocument performSynchronousFileAccessUsingBlock:]
-[NSDocument _checkAutosavingThenContinue:]
...
(lldb) po _NSDocumentSerializationInfo()
Pending serialization requests (3 total)
[0] FILE ACCESS: Document: "Untitled.sketch2" -- State: ACTIVE
  1  -[NSDocument performAsynchronousFileAccessUsingBlock:]
  2  -[SKTDocument doSomethingWithFile]
  ...

[1] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
  1  -[NSDocument performAsynchronousFileAccessUsingBlock:]
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  ...

[2] FILE ACCESS: Document: "Untitled.sketch2" -- State: WAITING
  1  -[NSDocument performSynchronousFileAccessUsingBlock:]
  2  -[NSDocument _checkAutosavingThenContinue:]
  ...
```

```
- (void)doSomethingWithFile {
    [self performAsynchronousFileAccessUsingBlock:^(void (^completionHandler)(void)) {
        if ([self fileURL]) {
            [self performSomeFileAccessThenContinue:^(
                completionHandler();
            )];
        }
    }];
}
```

```
- (void)doSomethingWithFile {
    [self performAsynchronousFileAccessUsingBlock:^(void (^completionHandler)(void)) {
        if ([self fileURL]) {
            [self performSomeFileAccessThenContinue:^(
                completionHandler();
            )];
        }
    }];
}
```

```
- (void)doSomethingWithFile {
    [self performAsynchronousFileAccessUsingBlock:^(void (^completionHandler)(void)) {
        if ([self fileURL]) {
            [self performSomeFileAccessThenContinue:^(
                completionHandler();
            )];
        }
    }];
}
```



```
- (void)doSomethingWithFile {
    [self performAsynchronousFileAccessUsingBlock:^(void (^completionHandler)(void)) {
        if ([self fileURL]) {
            [self performSomeFileAccessThenContinue:^(
                completionHandler());
            }];
        }
    }];
}
```

```
- (void)doSomethingWithFile {
    [self performAsynchronousFileAccessUsingBlock:^(void (^completionHandler)(void)) {

        if ([self fileURL]) {
            [self performSomeFileAccessThenContinue:^(
                completionHandler();
            )];
        } else {
            completionHandler();
        }

    }];
}
```



Auto Save

Adoption
Responsiveness
Serialization
Versions



iCloud

Adoption
Mechanics
Best Practices

Versions

Versions

- Revert and Versions Browser

Versions

- Revert and Versions Browser
- Periodically preserves document contents

Versions

- Revert and Versions Browser
- Periodically preserves document contents
- Automatic

Pre-Save Preservation



My Document

Pre-Save Preservation



Versions



My Document

Pre-Save Preservation



Versions



My Document

Pre-Save Preservation



Versions



My Document

Pre-Save Preservation



Backup File Optimization



Versions



My Document

Pre-Save Preservation



Backup File Optimization



Versions



My Document (Backup)

Pre-Save Preservation



Backup File Optimization



Versions



My Document (Backup)



My Document

Pre-Save Preservation



Backup File Optimization



Versions



My Document

Pre-Save Preservation



Backup File Optimization



Versions



My Document

`-writeSafelyToURL:ofType:forSaveOperation:error:`

Pre-Save Preservation



Backup File Optimization



Versions



My Document (Backup)



My Document

`-writeSafelyToURL:ofType:forSaveOperation:error:`

`-backupFileURL`

Post-Save Preservation

Post-Save Preservation

Finished
Writing



Post-Save Preservation

Finished

Writing

Copy to Versions...



main thread



Post-Save Preservation

Finished
Writing

Copy to Versions...



main thread



Post-Save Preservation



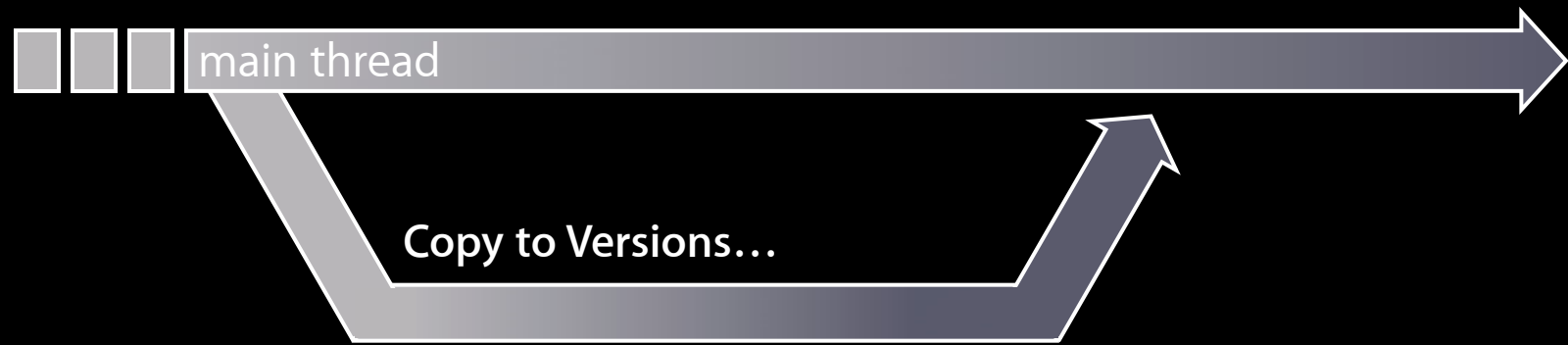
Finished Writing



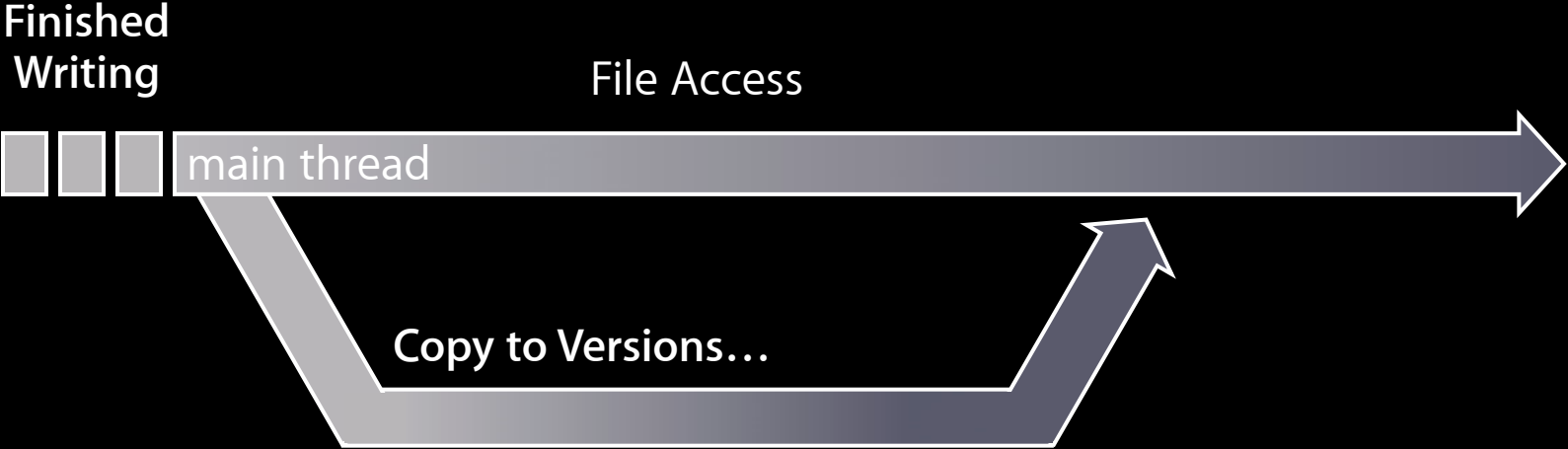
Post-Save Preservation



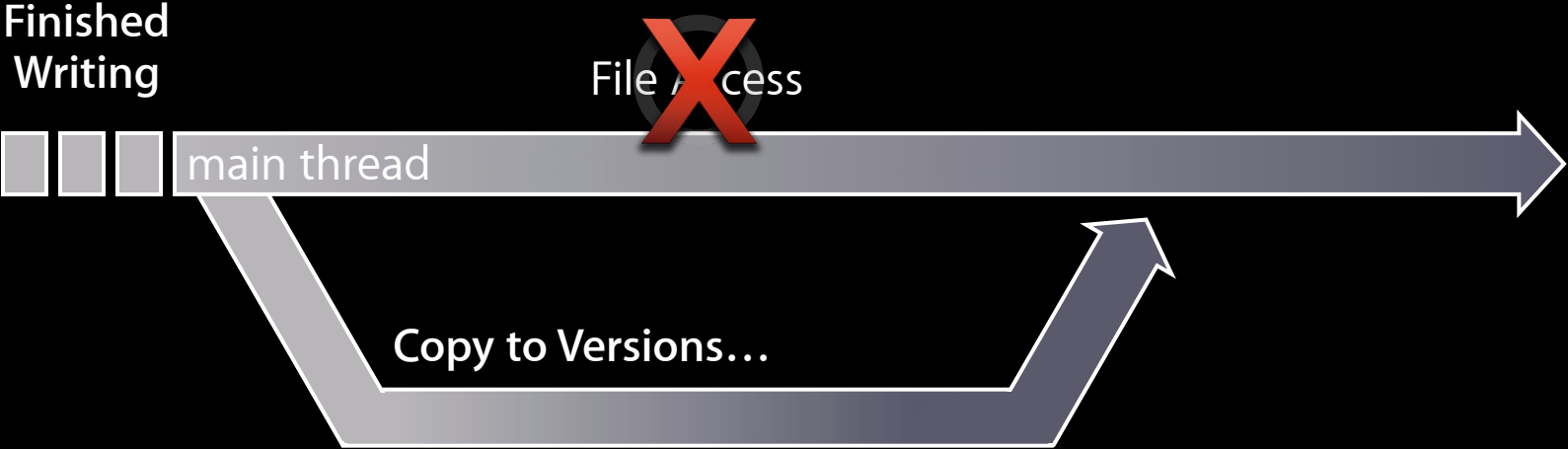
Finished Writing



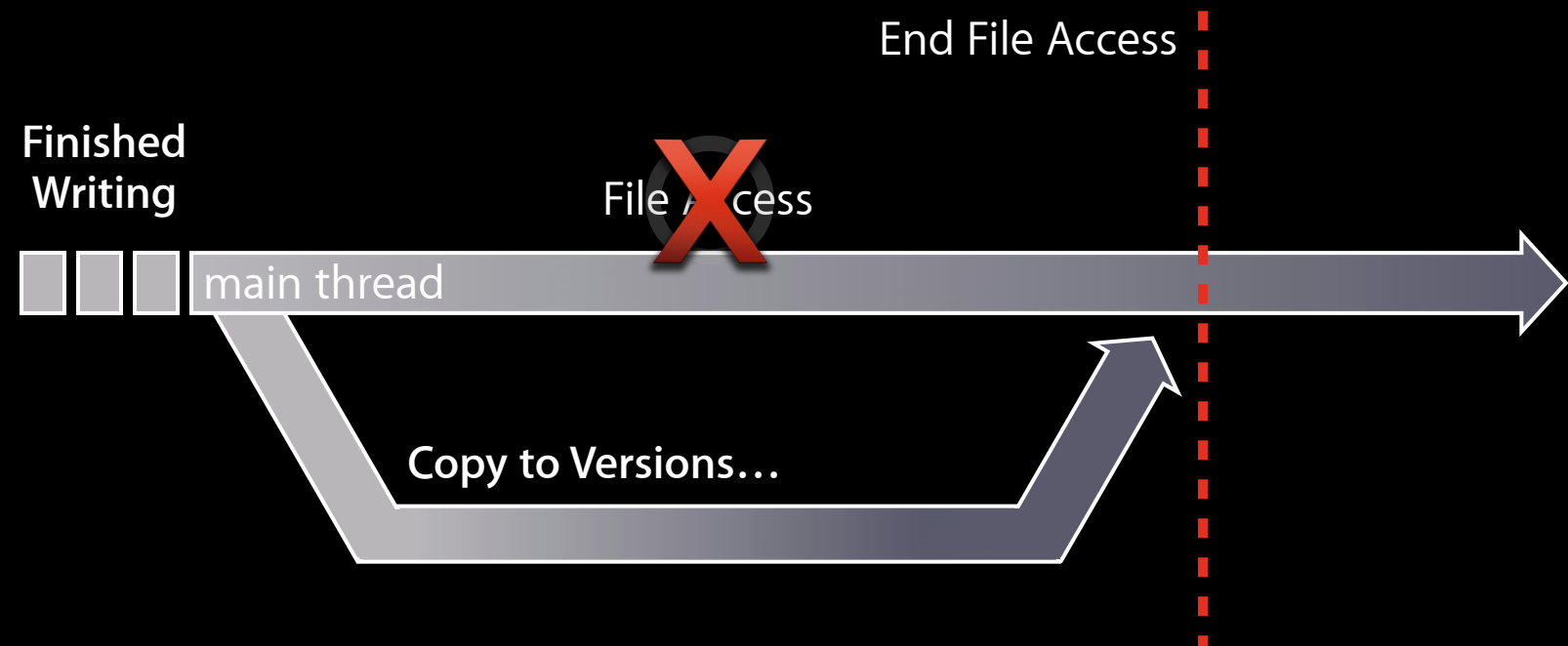
Post-Save Preservation



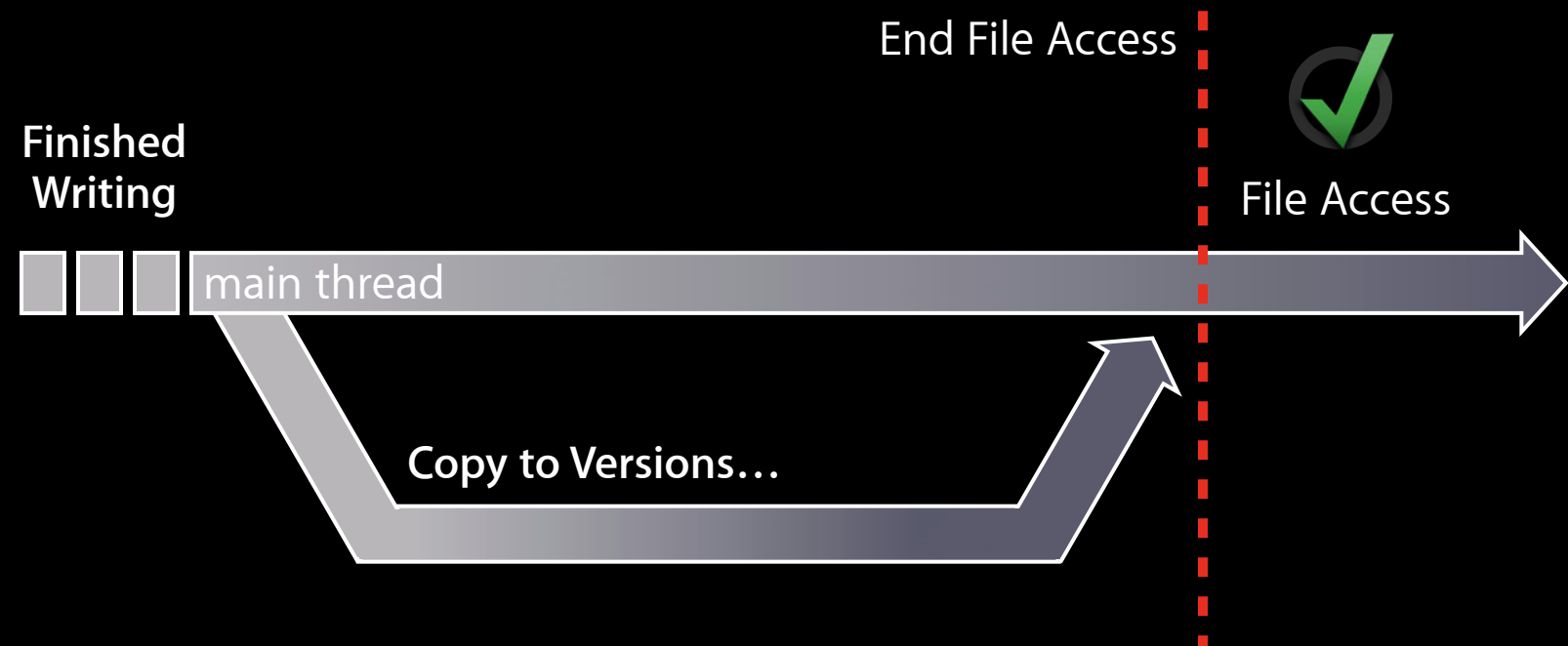
Post-Save Preservation



Post-Save Preservation



Post-Save Preservation





Auto Save

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iCloud

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Best Practices



Auto Save

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iCloud

Adoption
Mechanics
Best Practices

Opening iCloud Documents

Opening iCloud Documents

- App-Centric Open Panel

Opening iCloud Documents

- App-Centric Open Panel
- Non-modal

Opening iCloud Documents

- App-Centric Open Panel
- Non-modal
- New API


Opening iCloud Documents



- App-Centric Open Panel
- Non-modal
- New API

	Modal Only	Non-modal Supported
To Invoke	<code>-URLsFromRunningOpenPanel</code>	<code>-beginOpenPanelWithCompletionHandler:</code>
To Override	<code>-runModalOpenPanel:forTypes:</code>	<code>-beginOpenPanel:forTypes:completionHandler:</code>


Getting Documents In and Out of iCloud

A yellow sticky note with a white border and a small white tab at the bottom right corner. It is centered on the black background.

For QC: Leave in
ellipsis and colon

Getting Documents In and Out of iCloud


- App-Centric Open Panel

A yellow sticky note with a white border and a small white tab at the top right corner. The text on the note is in a black, sans-serif font.

For QC: Leave in
ellipsis and colon

Getting Documents In and Out of iCloud


- App-Centric Open Panel
- “Move To...” and “Move to iCloud”

A yellow sticky note with a small icon in the top right corner and a folded bottom-right corner. It contains the text: "For QC: Leave in ellipsis and colon".

For QC: Leave in
ellipsis and colon

Getting Documents In and Out of iCloud


- App-Centric Open Panel
- “Move To...” and “Move to iCloud”
 - NSDocument: `-moveToURL:completionHandler:`

A yellow sticky note with a small icon in the top right corner and a folded bottom-right corner. It contains the text: "For QC: Leave in ellipsis and colon".

For QC: Leave in
ellipsis and colon

Getting Documents In and Out of iCloud

- App-Centric Open Panel
- “Move To...” and “Move to iCloud”
 - NSDocument: `-moveToURL:completionHandler:`
- Drafts

A yellow sticky note with a white border and a small white tab at the top right corner. The text on the note is in a black, sans-serif font.

For QC: Leave in
ellipsis and colon

Drafts



Ubiquity Container

Drafts



Ubiquity Container



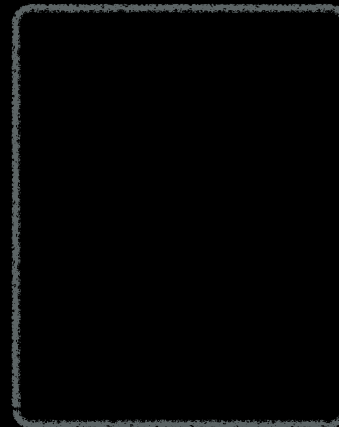
Untitled

Drafts



Ubiquity Container

NSChangeDone



Untitled

Drafts



Ubiquity Container



>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute inure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Untitled

Drafts



Ubiquity Container

NSAutosaveAsOperation



>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute inure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

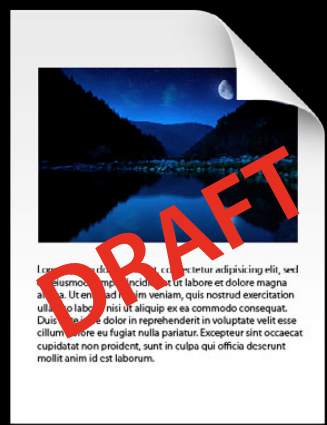
Untitled

Drafts



Ubiquity Container

NSAutosaveAsOperation



Untitled

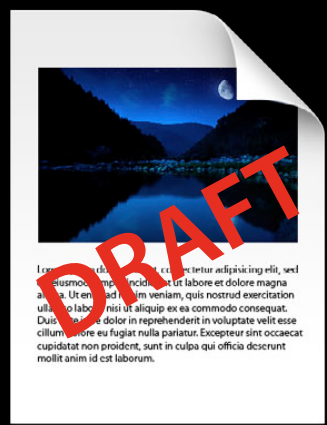
Drafts



Ubiquity Container

NSAutosaveAsOperation

Save



Untitled

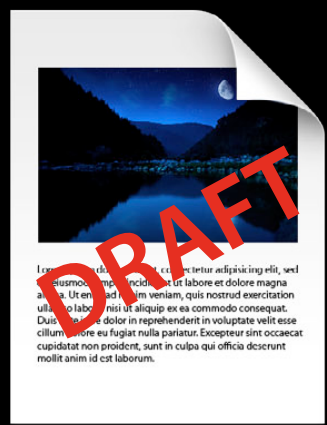
Drafts



Ubiquity Container

NSAutosaveAsOperation

Save
Rename



Untitled

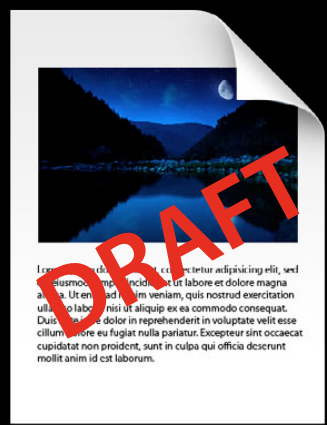
Drafts



Ubiquity Container

NSAutosaveAsOperation

Save
Rename
Move



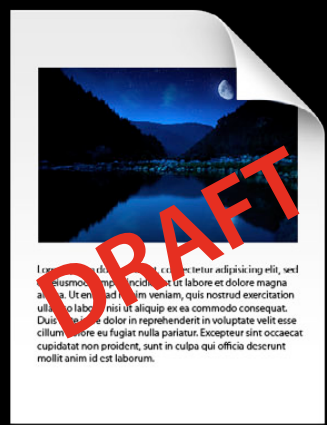
Untitled

Drafts



Ubiquity Container

Save
Rename
Move



My Document

Drafts



Ubiquity Container

Save
Rename
Move



My Document

Draft APIs



Draft APIs



	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	NSAutosaveAsOperation

Draft APIs



	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	NSAutosaveAsOperation

Accessors

-setDraft: & -isDraft

Draft APIs



	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	NSAutosaveAsOperation

Accessors	-setDraft: & -isDraft
Customize Draft Name	-defaultDraftName

Draft APIs



	User Initiated	Automatic
Save In Place	"Save" — NSSaveOperation	NSAutosaveInPlaceOperation
Save Elsewhere	"Export" — NSSaveToOperation	NSAutosaveElsewhereOperation
Save Elsewhere & Redirect	"Save As" — NSSaveAsOperation	NSAutosaveAsOperation

Accessors	-setDraft: & -isDraft
Customize Draft Name	-defaultDraftName
Disable Drafts	+autosavesDrafts

Sending Changes



Sending Changes



Coordinated Write

Sending Changes



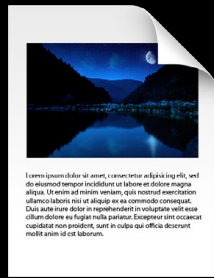
Coordinated Write

Sending Changes

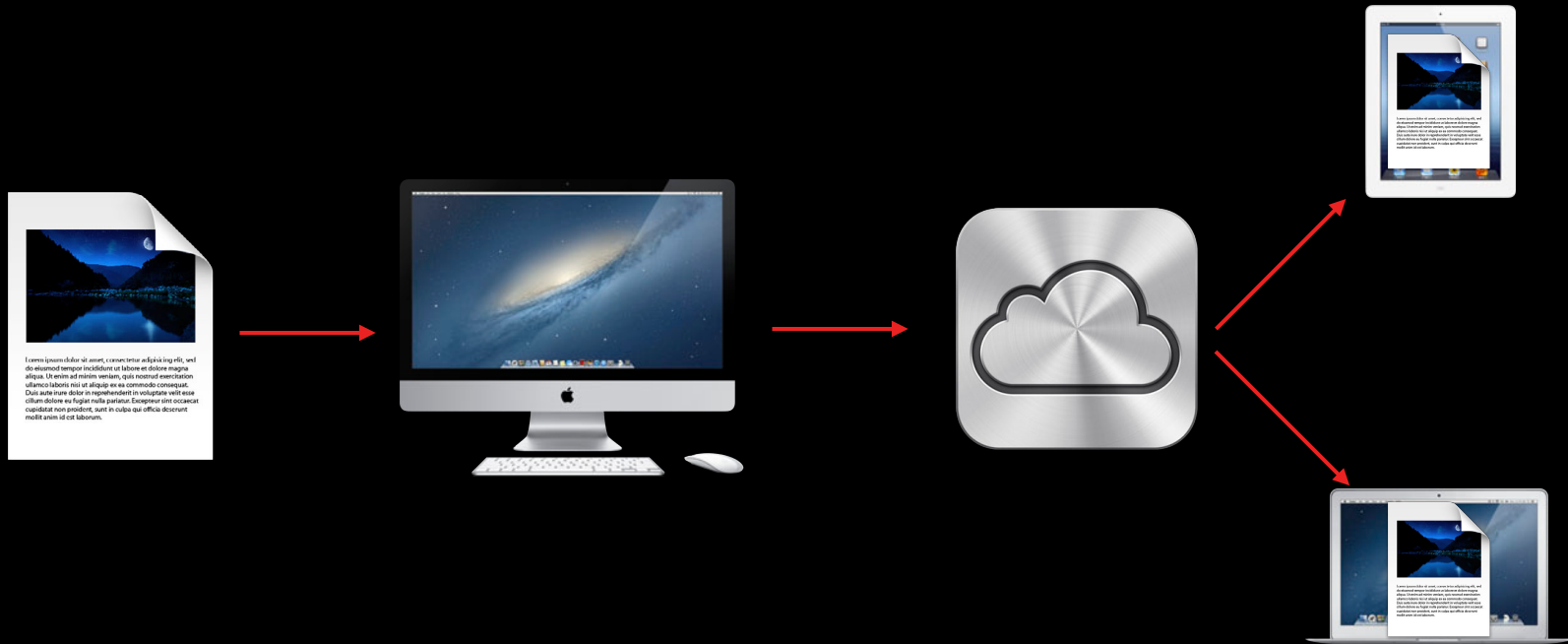


Coordinated Write

Sending Changes



Sending Changes



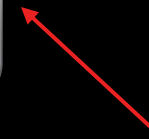
Receiving Changes



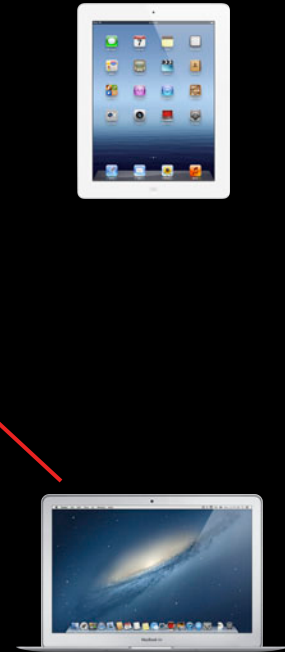
Receiving Changes



Receiving Changes



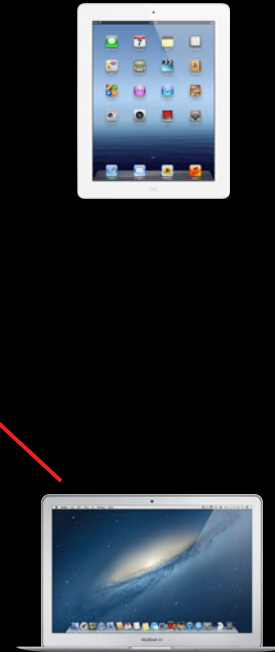
Receiving Changes



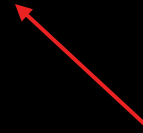
Receiving Changes



Coordinated Write



Receiving Changes



Coordinated Write

Receiving Changes



Revert



Coordinated Write



Receiving Changes



Revert



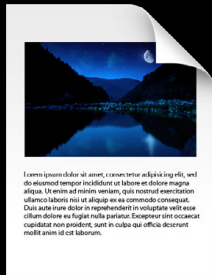
Coordinated Write



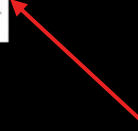
Conflicting Changes



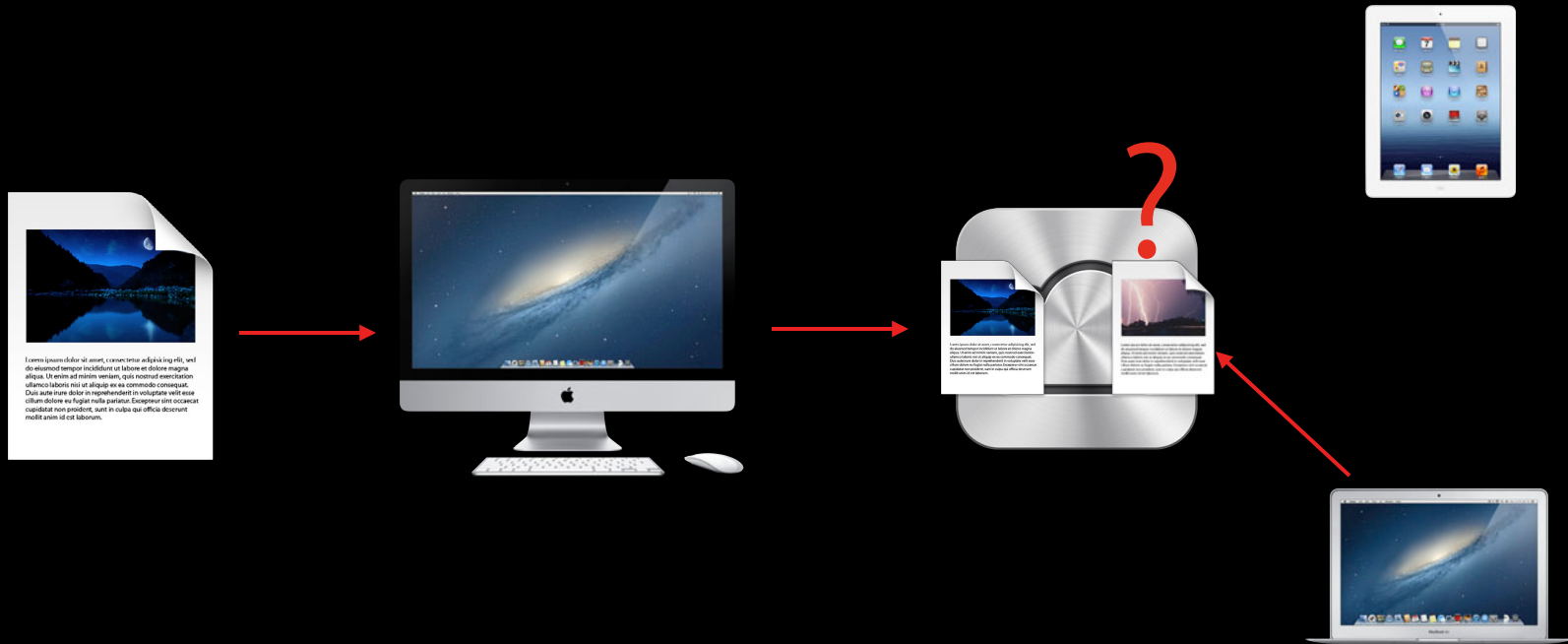
Conflicting Changes



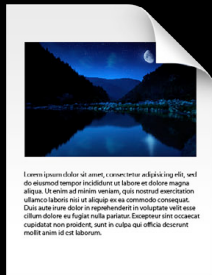
Conflicting Changes



Conflicting Changes



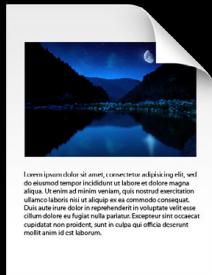
Conflicting Changes



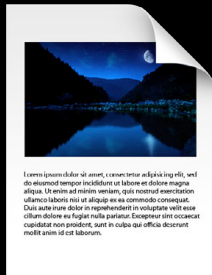
Conflicting Changes



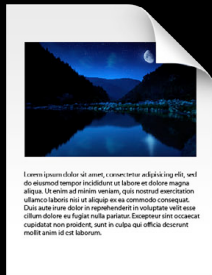
Conflicting Changes



Conflicting Changes



Conflicting Changes





Auto Save

Adoption
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Serialization
Versions



iCloud

Adoption
Mechanics
Best Practices

Best Practices

Best Practices

- Override NSDocument as little as possible

Best Practices

- Override NSDocument as little as possible
- Eliminate open panel accessory views

Best Practices

- Override NSDocument as little as possible
- Eliminate open panel accessory views
- Quick Look thumbnail and preview

Best Practices

- Override NSDocument as little as possible
- Eliminate open panel accessory views
- Quick Look thumbnail and preview
- File formats

Best Practices

- Override NSDocument as little as possible
- Eliminate open panel accessory views
- Quick Look thumbnail and preview
- File formats
- Consider App running simultaneously on different devices

Best Practices

- Override NSDocument as little as possible
- Eliminate open panel accessory views
- Quick Look thumbnail and preview
- File formats
- Consider App running simultaneously on different devices
- Test reverting

Dropping Down a Level

A yellow sticky note with a small icon in the top right corner, containing the text: For QC: Colon part of code, leave in.

For QC: Colon part
of code, leave in.

Dropping Down a Level

- Foundation APIs



For QC: Colon part
of code, leave in.

Dropping Down a Level

- Foundation APIs
 - File Coordination



For QC: Colon part
of code, leave in.

Dropping Down a Level


- Foundation APIs
 - File Coordination
 - -URLForUbiquityContainerIdentifier:



For QC: Colon part
of code, leave in.

Dropping Down a Level

- Foundation APIs
 - File Coordination
 - -URLForUbiquityContainerIdentifier:
 - NSMetadataQuery



For QC: Colon part
of code, leave in.

Dropping Down a Level



- Foundation APIs
 - File Coordination
 - -URLForUbiquityContainerIdentifier:
 - NSMetadataQuery
 - -ubiquityIdentityToken

For QC: Colon part
of code, leave in.

Dropping Down a Level



- Foundation APIs
 - File Coordination
 - -URLForUbiquityContainerIdentifier:
 - NSMetadataQuery
 - -ubiquityIdentityToken
 - NSUbiquityIdentityDidChangeNotification

For QC: Colon part
of code, leave in.

Dropping Down a Level



- Foundation APIs
 - File Coordination
 - -URLForUbiquityContainerIdentifier:
 - NSMetadataQuery
 - -ubiquityIdentityToken
 - NSUbiquityIdentityDidChangeNotification
- +usesUbiquitousStorage
 - Disable NSDocument iCloud features

For QC: Colon part
of code, leave in.



Auto Save

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iCloud

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Related Sessions

Using iCloud with UIDocument

Marina
Wednesday 10:15AM

Using iCloud with Core Data

Mission
Thursday 4:30PM

Advanced iCloud Document Storage

Marina
Thursday 3:15PM

Labs

Open and Save Panels Within an App Sandbox Q & A Lab	Essentials Lab B Wednesday 4:30PM
Security Lab	Core OS Lab B Thursday 9:00AM
Cocoa and OS X Gestures Lab	Essentials Lab B Thursday 2:00PM
iCloud Storage Lab	Essentials Lab B Thursday 4:30PM
Cocoa and XPC Lab	Essentials Lab B Friday 10:30AM
iCloud Storage Lab	Essentials Lab B Friday 11:30AM

More Information

Mike Jurewitz

Developer Tools and Performance Evangelist

jury@apple.com

 WWDC2012

