

Using iCloud with UIDocument

Session 218

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Engineer, iOS Frameworks

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

Anatomy of This Talk

Anatomy of This Talk

- Build a Working iCloud App

Anatomy of This Talk

- Build a Working iCloud App
- Application Design

Anatomy of This Talk

- Build a Working iCloud App
- Application Design
- Document Design

Anatomy of This Talk

- Build a Working iCloud App
- Application Design
- Document Design
- Finishing Your App

Demo

Introducing CloudNotes 2.0

Application Design

Deciding Where to Store Documents

Deciding Where to Store Documents

- Let the user decide

Deciding Where to Store Documents

- Let the user decide
- All or none in the cloud

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Accessing iCloud Storage

Set up at application launch

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application:didFinishLaunchingWithOptions:
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```
[[NSFileManager defaultManager]  
 ubiquityIdentityToken]
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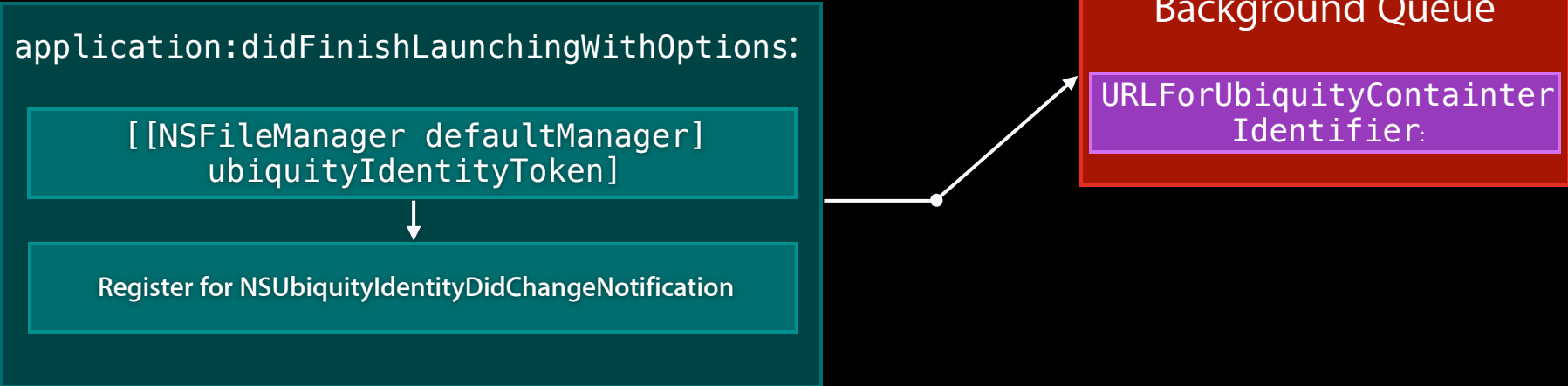
```
[[NSFileManager defaultManager]  
 ubiquityIdentityToken]
```



```
Register for NSUbiquityIdentityDidChangeNotification
```

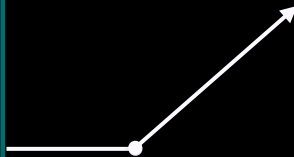
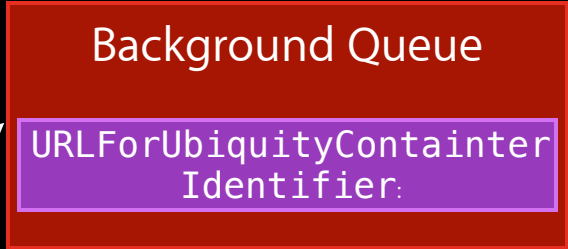
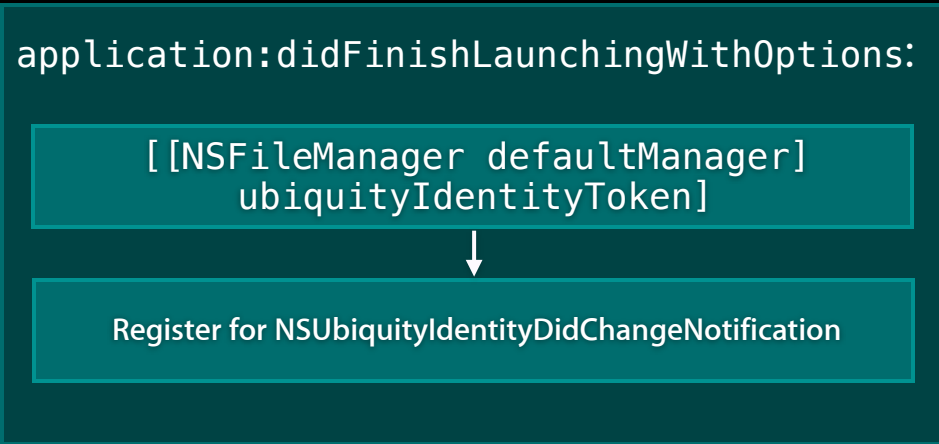

Accessing iCloud Storage

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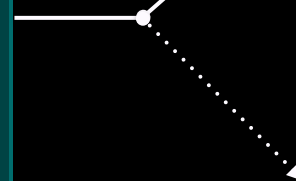


```
application:didFinishLaunchingWithOptions:  
  
    [[NSFileManager defaultManager]  
     ubiquityIdentityToken]  
  
    Register for NSUbiquityIdentityDidChangeNotification
```

Background Queue

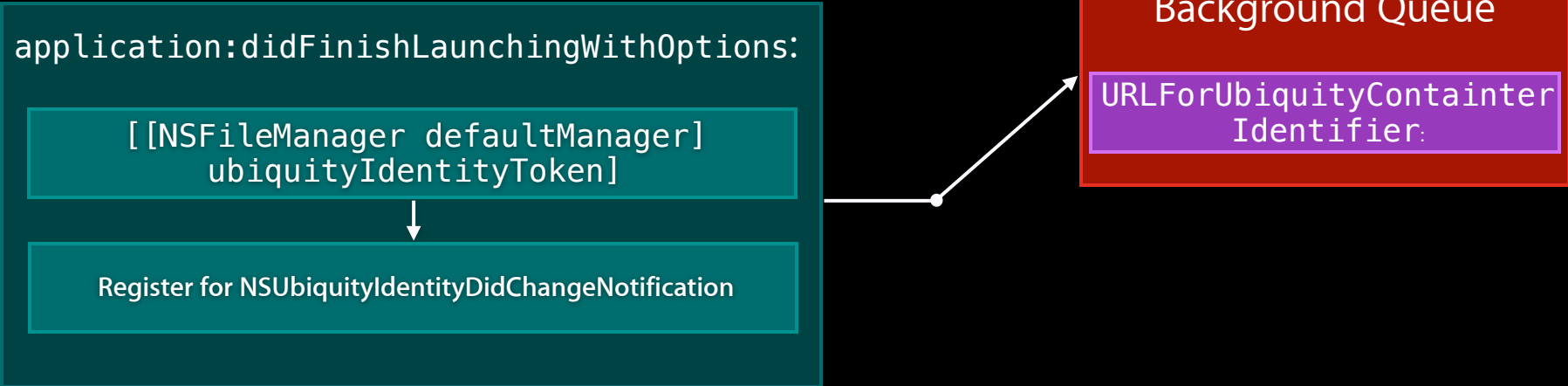
URLForUbiquityContainerIdentifier:

Provide Loading UI



Accessing iCloud Storage

Set up at application launch



Demo

Starting up the App

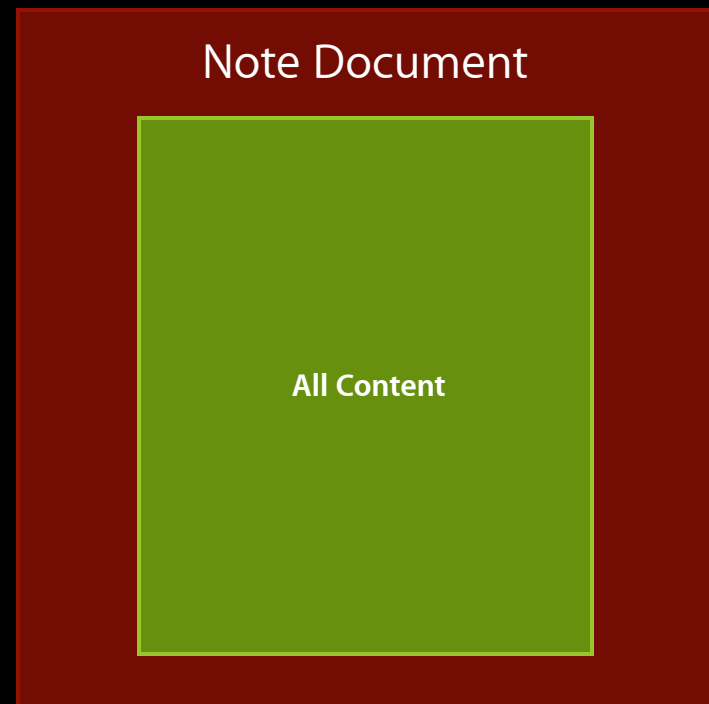
Document Design

Using File Packages

Using File Packages

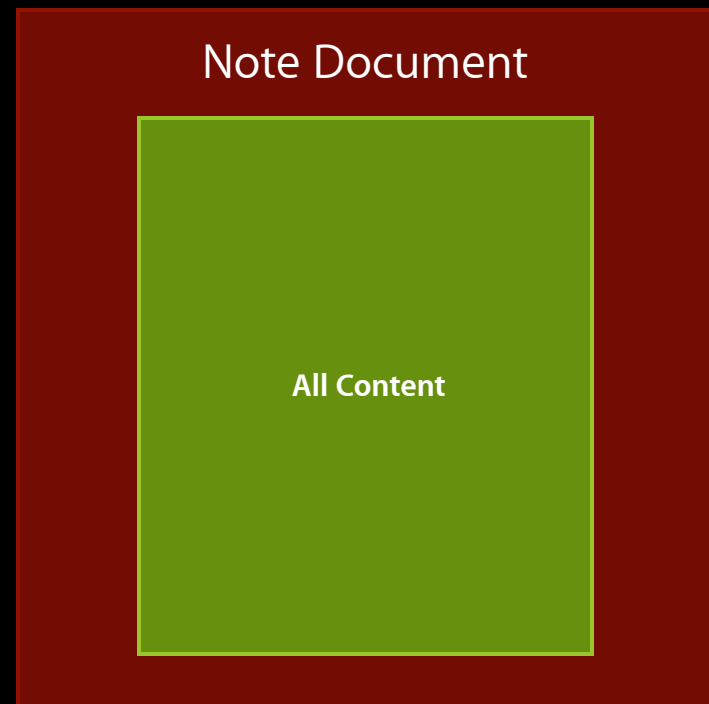
Note Document

Using File Packages



Using File Packages

- Break data into logical components



Using File Packages

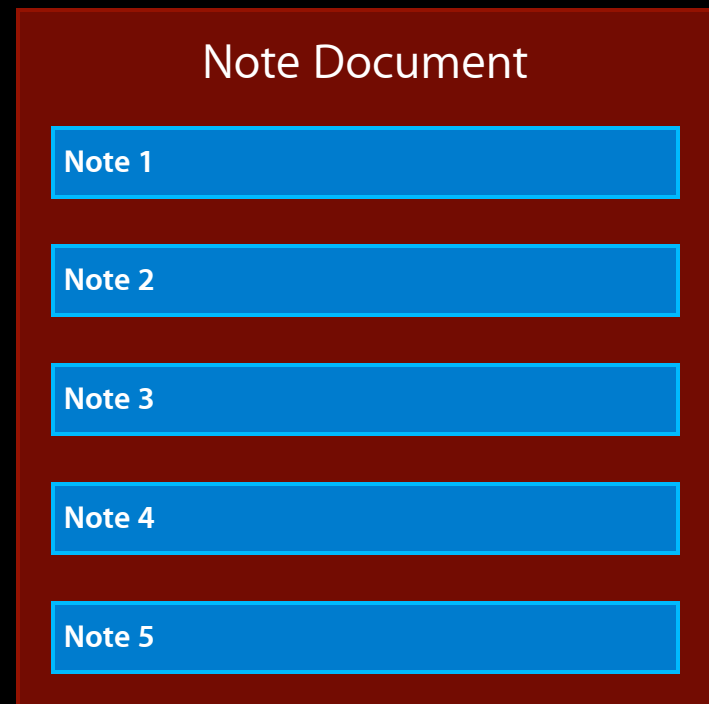
- Break data into logical components



Note Document

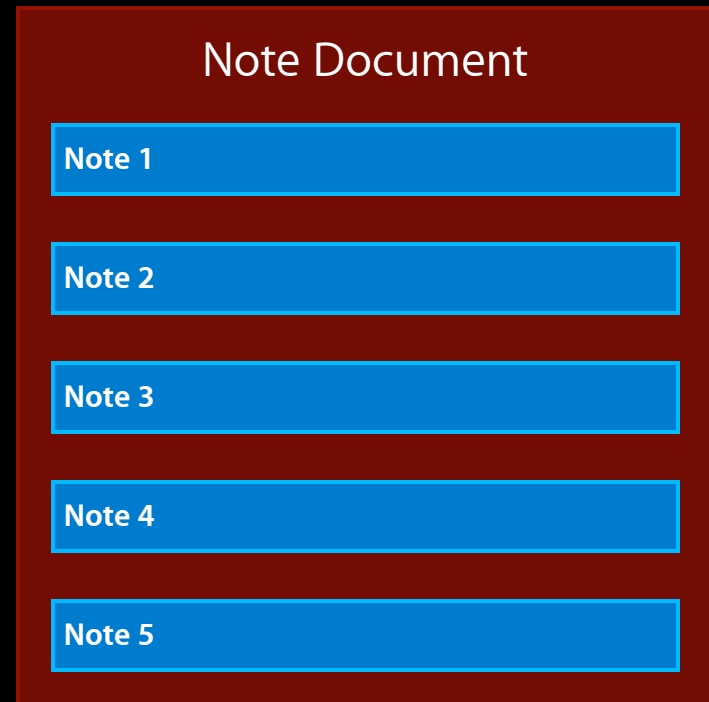
Using File Packages

- Break data into logical components



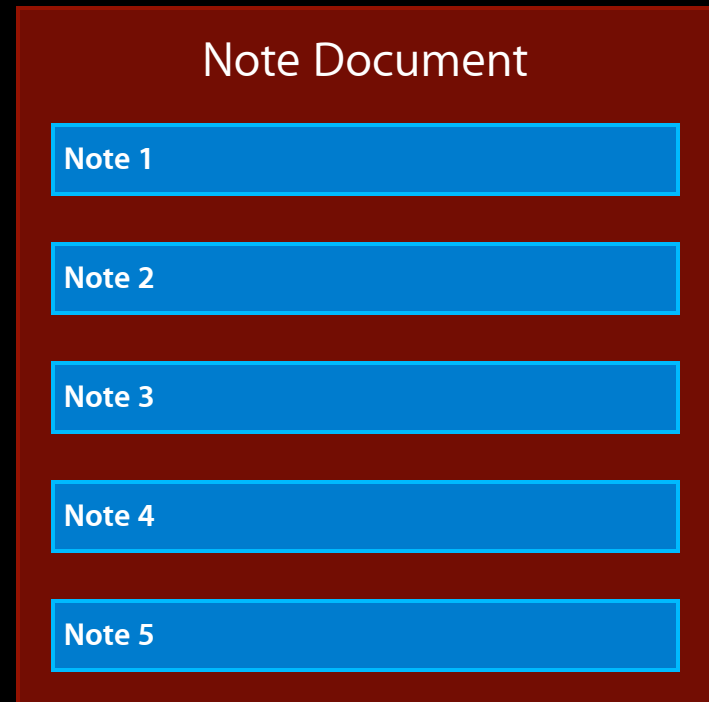
Using File Packages

- Break data into logical components
- Separate content from assets



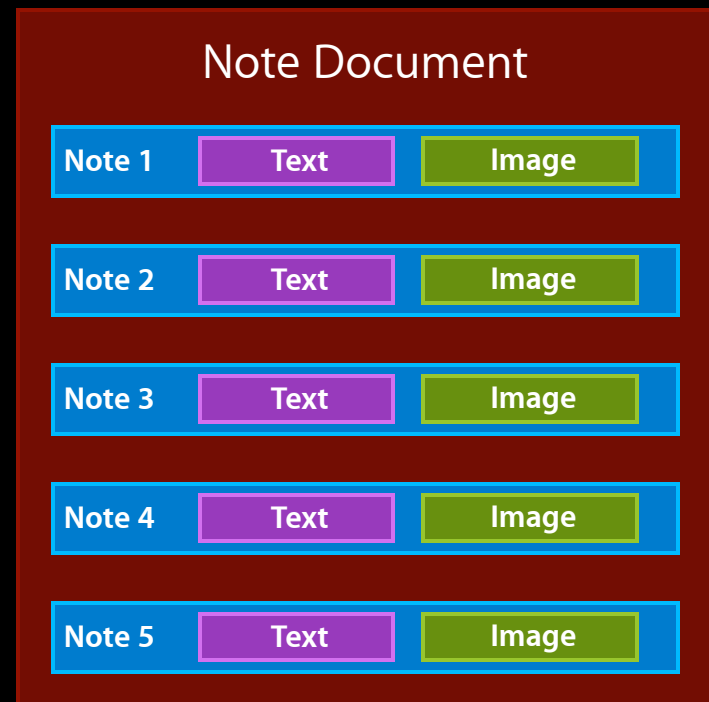
Using File Packages

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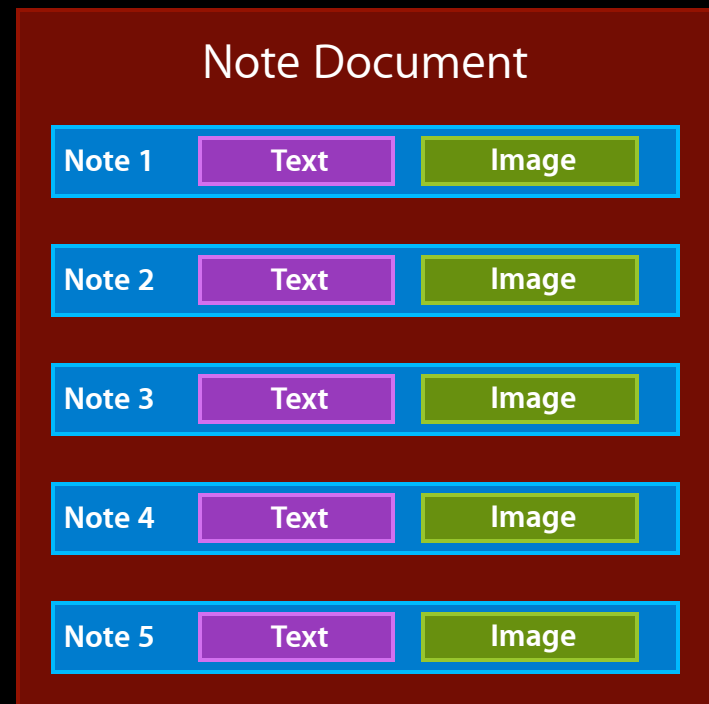
Using File Packages

- Break data into logical components
- Separate content from assets



Using File Packages

- Break data into logical components
- Separate content from assets
- Break out items less likely to be edited



Using File Packages

Reading

Using File Packages

Reading

```
- (BOOL)loadFromContents:(id)contents
                    ofType:(NSString *)typeName
                    error:(NSError **)outError
{
    // Make these contents our new master file wrapper and load the index file.
    if (contents) {
        _fileWrapper = contents;
        _index = [[NSKeyedUnarchiver unarchiveObjectWithData:[[_fileWrapper
            fileWrappers] valueForKey:@"index"] regularFileContents]]
            mutableCopy];
        if (!_index) {
            _index = [NSMutableArray array];
        }
    }
    else {
        [self setupEmptyDocument];
    }

    // ... notify the delegate of the contents update
    return YES;
}
```

Using File Packages

Reading

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Using File Packages

Writing

Using File Packages

Writing

```
- (id)contentsForType:(NSString *)typeName error:(NSError **)outError
{
    // Snapshot our master file wrapper and return that.

    if (!_fileWrapper) {
        [self setupEmptyDocument];
    }
    return [[NSFileWrapper alloc]
            initWithDirectoryWithFileWrappers:_fileWrapper.fileWrappers];
}
```

Using File Packages

Writing

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- (id)contentsForType:(NSString *)typeName error:(NSError **)outError
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    // Snapshot our master file wrapper and return that.

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Forward Thinking Design

Forward Thinking Design

- Consider future updates to your file format

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- File format versioning

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- Interverision compatibility

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 - Read/Write

Forward Thinking Design

- Consider future updates to your file format
- File format versioning
- Interverision compatibility
 - Read/Write
 - Read-only

Forward Thinking Design

- Consider future updates to your file format
- File format versioning
- Interverision compatibility
 - Read/Write
 - Read-only
 - Not compatible

Things *Not* to Include in Your Document



Things *Not* to Include in Your Document

- Scroll position



Things *Not* to Include in Your Document

- Scroll position
- Last opened time stamp



Things *Not* to Include in Your Document

- Scroll position
- Last opened time stamp
- Anything that can result in a sync loop



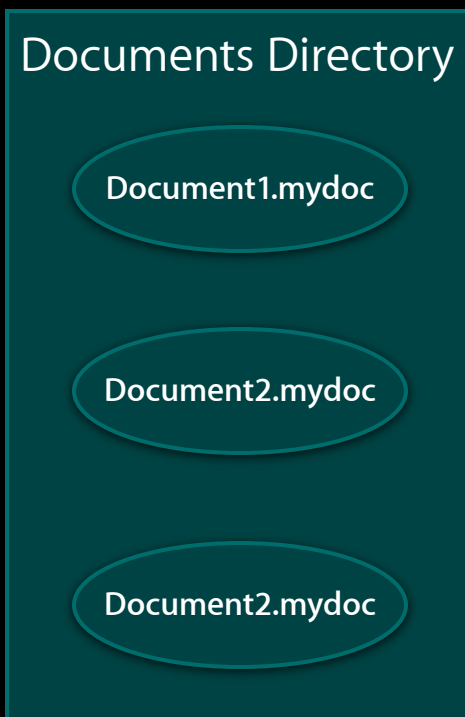
Things *Not* to Include in Your Document

- Scroll position
- Last opened time stamp
- Anything that can result in a sync loop
- Sensitive information when publishing

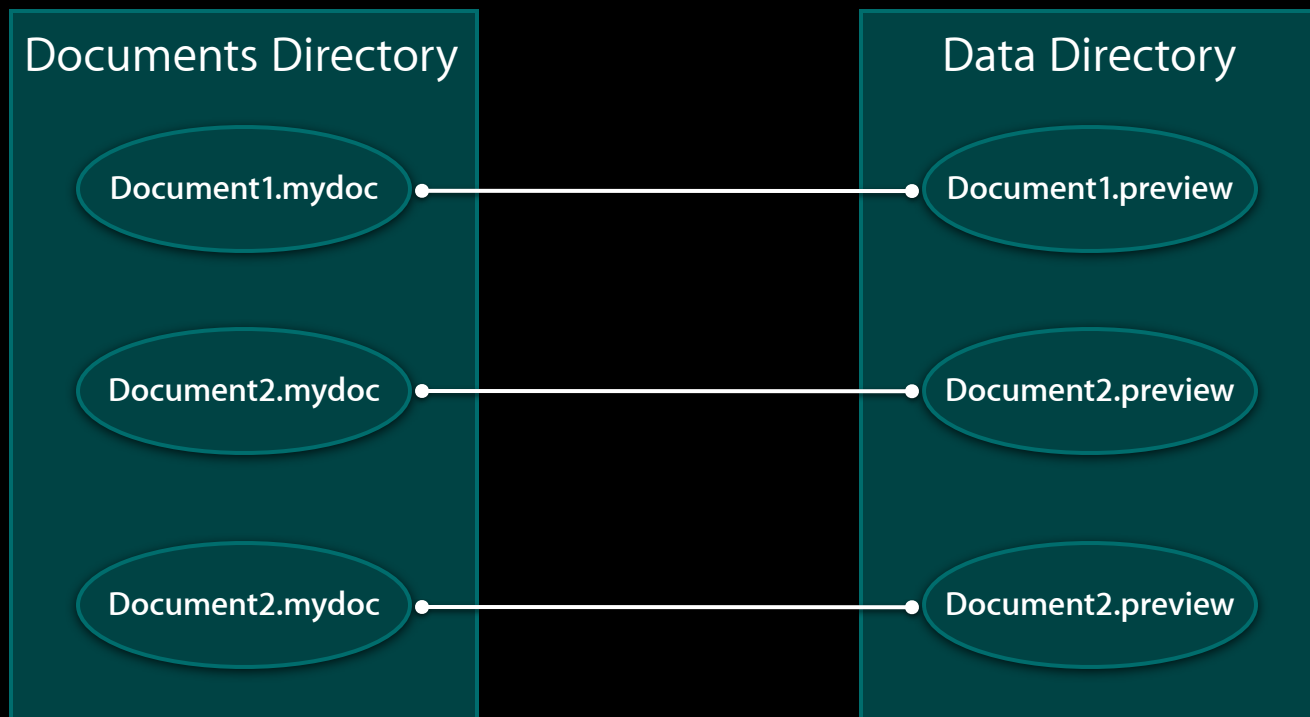


Including a Document Preview

Including a Document Preview



Including a Document Preview



Including a Document Preview

Writing out the preview file

Including a Document Preview

Writing out the preview file

```
- (BOOL)writeContents:(id)contents
    andAttributes:(NSDictionary *)additionalFileAttributes
    safelyToURL:(NSURL *)url
    forSaveOperation:(UIDocumentSaveOperation)saveOperation
    error:(NSError **)outError
{
    BOOL success = [super writeContents:contents
        andAttributes:additionalFileAttributes safelyToURL:url
        forSaveOperation:saveOperation error:outError];

    if (success) {
        NSString* previewFileName = [self previewFileName];
        NSURL* previewFileURL = [self previewURL];
        [[self previewData] writeToURL:previewFileURL atomically:YES];
    }

    return success;
}
```

Including a Document Preview

Writing out the preview file

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Demo

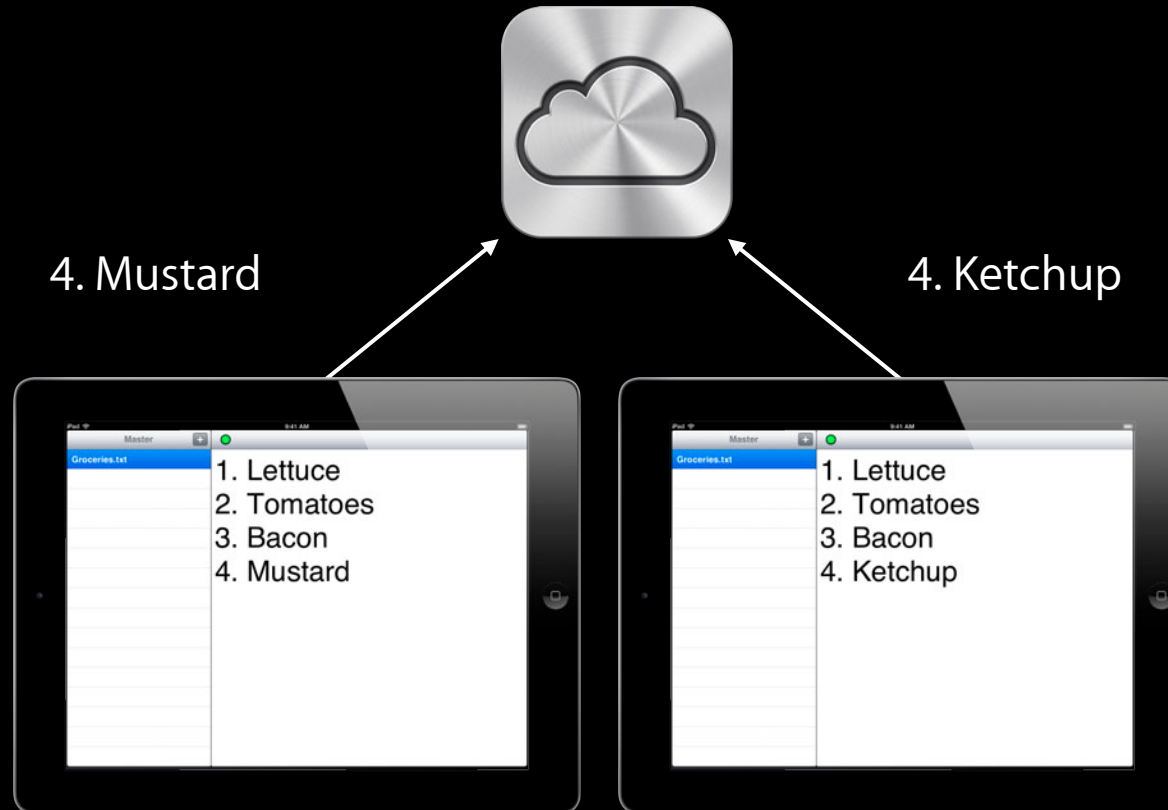
Building a document with Preview

Finishing Touches

Conflict Resolution



Conflict Resolution



Handling Conflicts

Handling Conflicts

- Always handle conflicts

Handling Conflicts

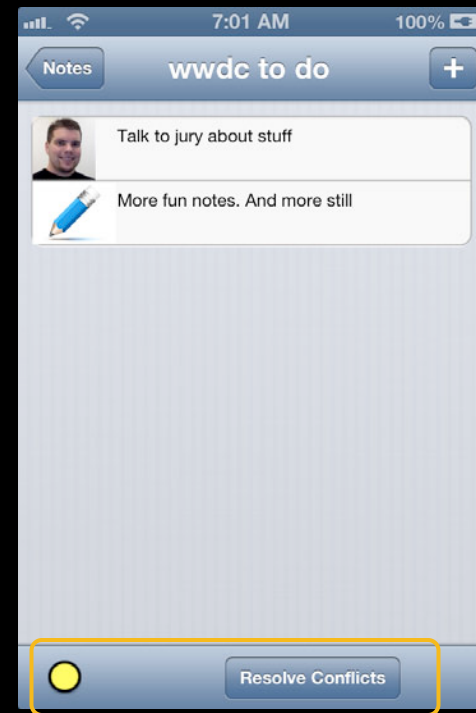
- Always handle conflicts
- Great strategy: Automatic merging

Handling Conflicts

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- If not automatic, be lazy

Handling Conflicts

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Advanced Error Handling in UIDocument

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Reading and
writing methods

Advanced Error Handling in UIDocument

Reading and
writing methods

```
handleError:userInteractionPermitted:
```

Advanced Error Handling in UIDocument

NSError

Reading and
writing methods

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handleError:userInteractionPermitted:
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Advanced Error Handling in UIDocument

Reading and
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Advanced Error Handling in UIDocument

Reading and
writing methods

NSError

MyDocument subclass

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handleError:userInteractionPermitted:
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Advanced Error Handling in UIDocument

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NSError

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Responding to Sign-Out

Responding to Sign-Out

- Register for
`NSUbiquityIdentityDidChangeNotification`

Responding to Sign-Out

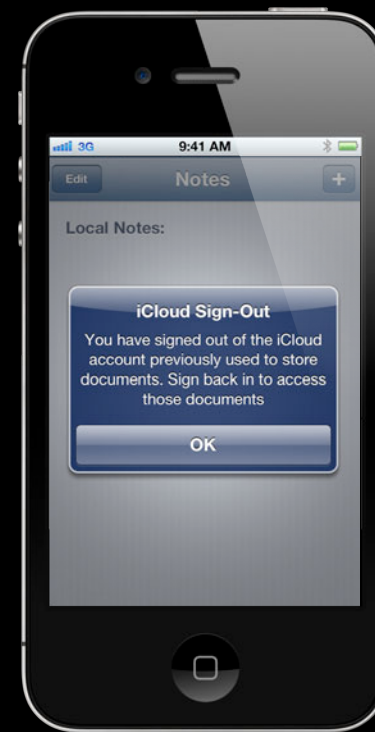
- Register for
 `NSUbiquityIdentityDidChangeNotification`
- Close open documents

Responding to Sign-Out

- Register for
 `NSUbiquityIdentityDidChangeNotification`
- Close open documents
- Provide user feedback

Responding to Sign-Out

- Register for `NSUbiquityIdentityDidChangeNotification`
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Testing Your iCloud App

Testing Your iCloud App

- Use airplane mode to create conflicts

Testing Your iCloud App

- Use airplane mode to create conflicts
- Changes while a document is open on another device

Testing Your iCloud App

- Use airplane mode to create conflicts
- Changes while a document is open on another device
 - Change the content

Testing Your iCloud App

- Use airplane mode to create conflicts
- Changes while a document is open on another device
 - Change the content
 - Change the name

Testing Your iCloud App

- Use airplane mode to create conflicts
- Changes while a document is open on another device
 - Change the content
 - Change the name
 - Delete the document

Testing Your iCloud App

- Use airplane mode to create conflicts
- Changes while a document is open on another device
 - Change the content
 - Change the name
 - Delete the document
- Exercise state restoration

Testing Your iCloud App

- Use airplane mode to create conflicts
- Changes while a document is open on another device
 - Change the content
 - Change the name
 - Delete the document
- Exercise state restoration
- Use Network Activity Monitor for performance analysis

Demo

Responding to Sign-Out

More Info

Michael Jurewitz

Developer Tools and Performance Evangelist

jury@apple.com

Related Sessions

Using iCloud with NSDocument

Marina
Wednesday 3:15PM

Using iCloud with Core Data

Mission
Wednesday 4:30PM

Advanced iCloud Document Storage

Marina
Thursday 3:15PM

Labs

iCloud Storage Lab

Essentials Lab B
Friday 11:30AM

 WWDC2012

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presentations.

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