

#WWDC18

Managing Documents In Your iOS Apps

Session 216

Brandon Tennant, Software Engineer

Thomas Deniau, Software Engineer

Rony Fadel, Software Engineer

Document Management on iOS

What's new?

Using the Document Management API

Raising the bar

Document Management on iOS

Document Management on iOS

What is it?

API for application developers

File provider API for cloud vendors

Files app

Edit

iCloud Drive

Pages

+ Select

Pages

Locations

- iCloud Drive
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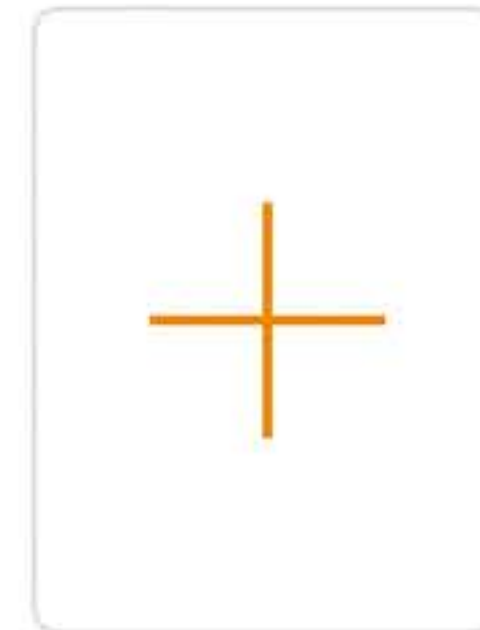
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Tags

- Orange
- Red
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Adventure Tours
May 4, 2017 at 5:03 PM
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501 KB



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Canterbury School
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528 KB



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52 MB



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May 30, 2018 at 4:30 PM
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Coffee
May 30, 2018 at 4:30 PM
106 MB



Contemporary Folk Jewelry
May 30, 2018 at 4:30 PM



Easy Rides Custom Bikes
May 30, 2018 at 4:30 PM



Field Report
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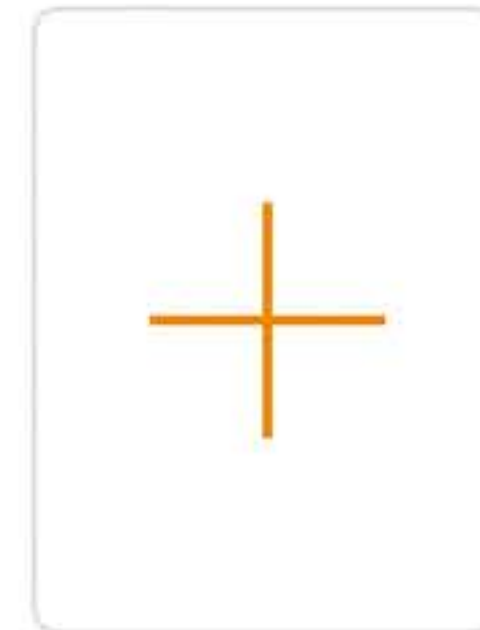
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Canterbury School
May 30, 2018 at 4:30 PM
528 KB



School projects



Surf School
Apr 22, 2009 at 3:25 PM
229 KB

Search School

Cancel



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May 30, 2018 at 4:30 PM
528 KB



School projects



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Apr 22, 2009 at 3:25 PM
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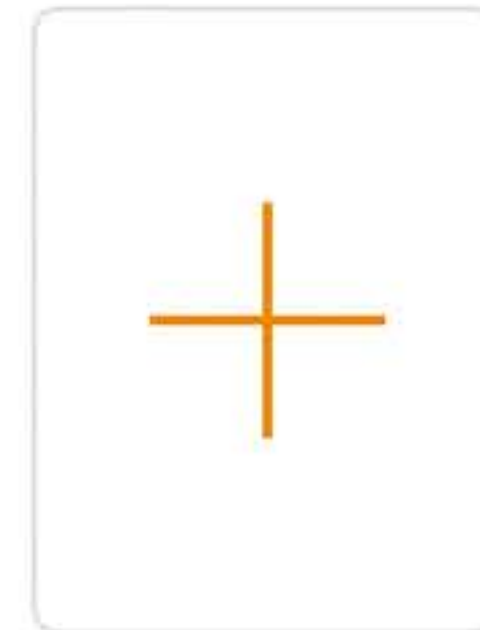
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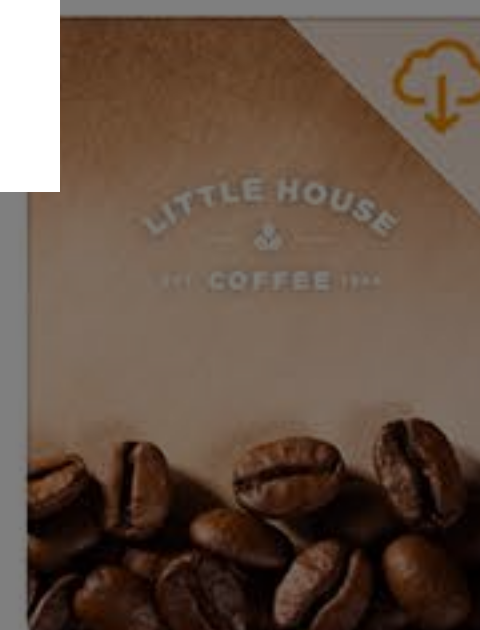
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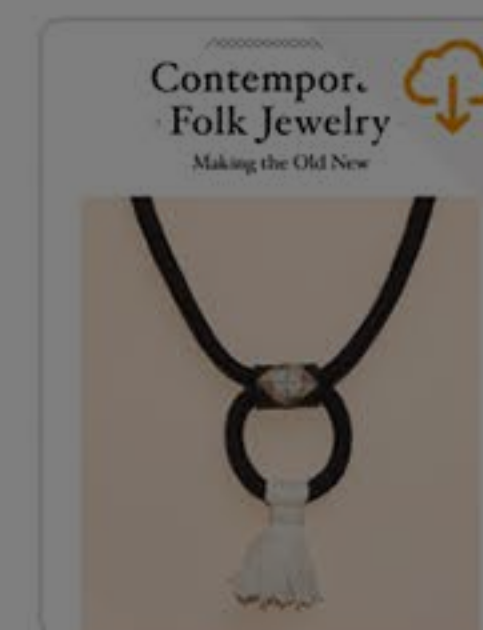
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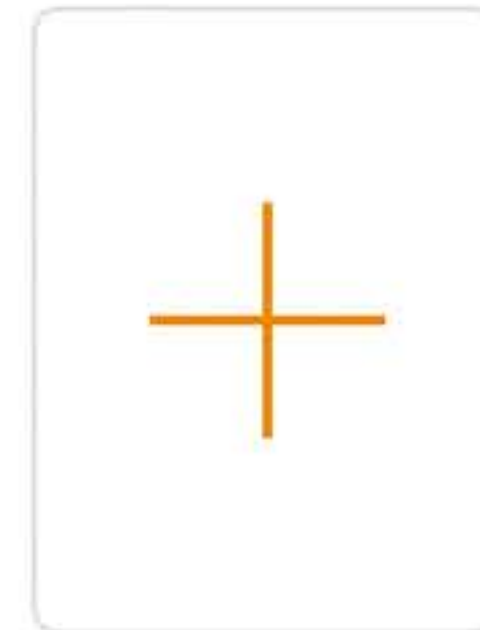
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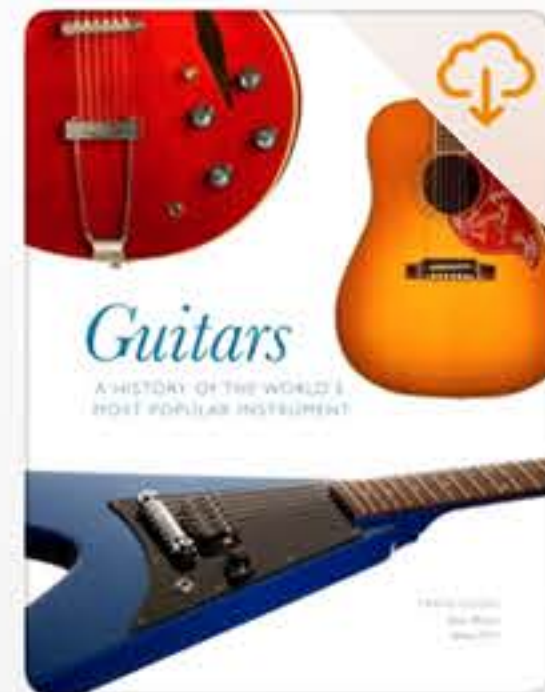
Pages Recents

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Science Fair
May 30, 2018 at 5:54 PM
748 KB



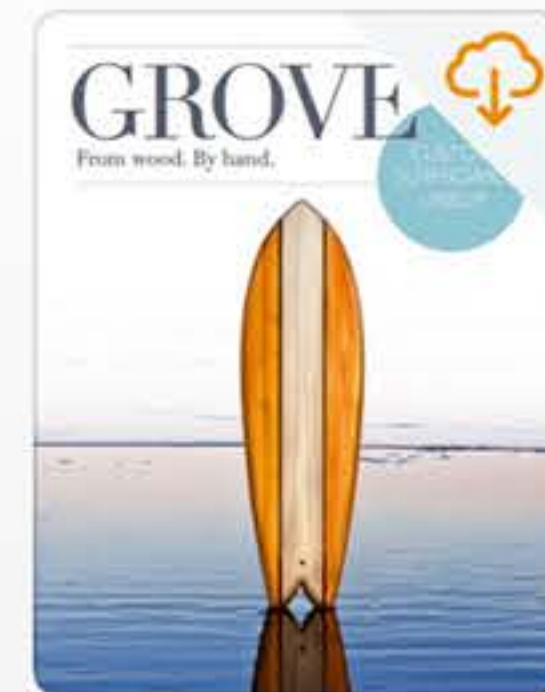
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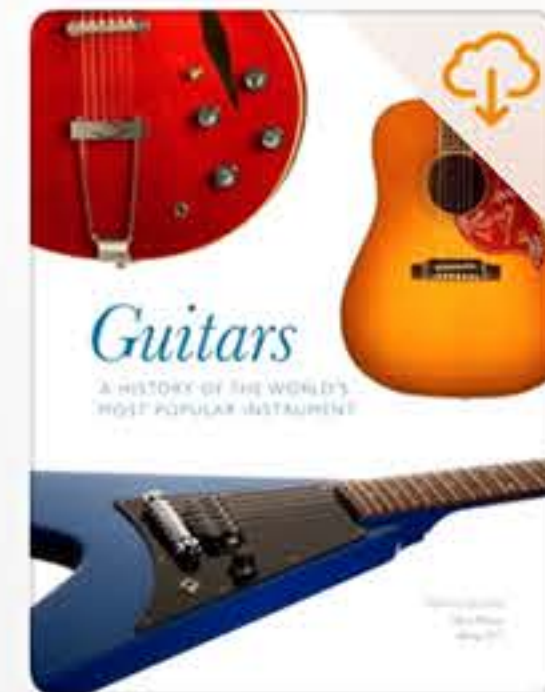
Chairs
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Adventure Tours
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4.7 MB



Grove Surfboards
May 4, 2017 at 7:14 PM
3.4 MB



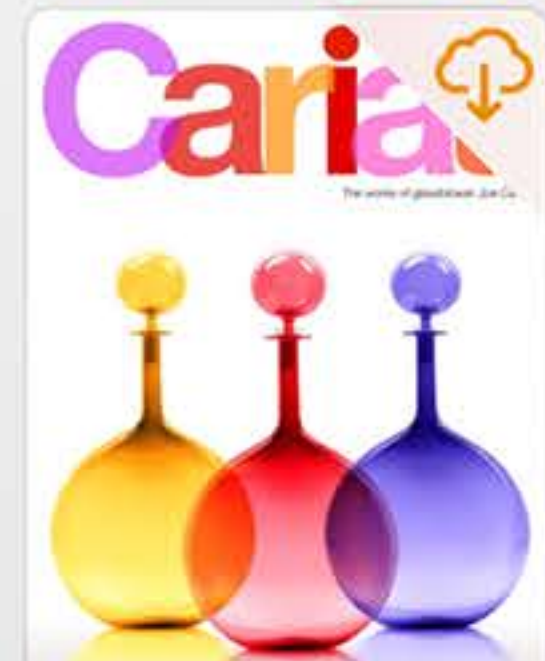
Guitars
May 4, 2017 at 3:24 PM
12.4 MB



Chinese Calligraphy
May 2, 2017 at 3:39 PM
5.3 MB



Whitestone Farms
May 2, 2017 at 1:40 PM
2.4 MB



Glass
May 2, 2017 at 1:37 PM
26.6 MB

Important



Recents

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Document Management on iOS

Client API

Document Browser	UIDocumentBrowserViewController
------------------	---------------------------------

Document Picker	UIDocumentPickerViewController
-----------------	--------------------------------

File Coordination	NSFileCoordinator, UIDocument
-------------------	-------------------------------

File Operations	NSFileManager
-----------------	---------------

Document Management on iOS

File Provider API

File Provider Extension

NSFileProviderExtension

File Provider Custom Actions

FPUIActionExtensionViewController

File Provider Enhancements

WWDC 2017

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Beach
May 1, 2017 at 3:48 PM
10.4 MB



Dad and Jimmy
May 2, 2017 at 2:23 PM
2.7 MB



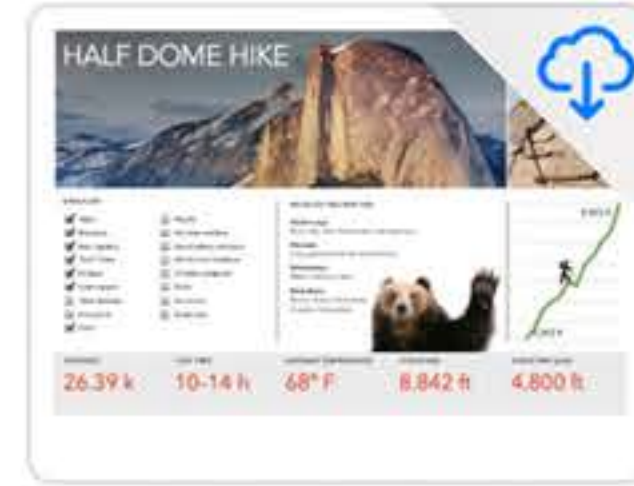
Desktop
10 items



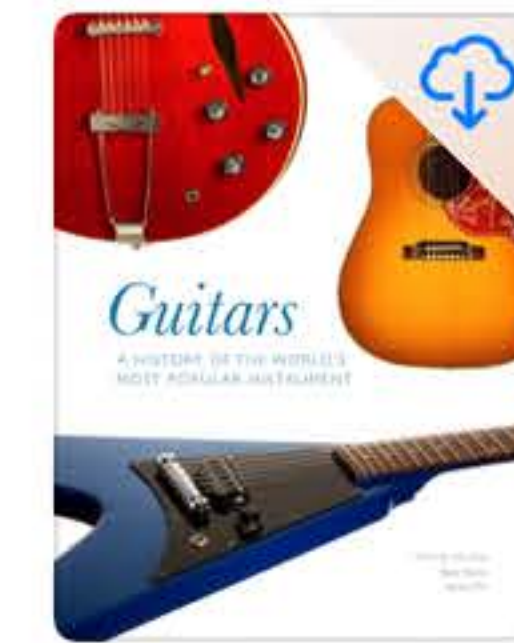
Documents
77 items



Half Dome
May 1, 2017 at 5:31 PM
2.7 MB



Hiking Trip
May 30, 2018 at 4:30 PM
12.5 MB



History of Guitars
May 30, 2018 at 4:30 PM
12.4 MB



JPEG image
Apr 11, 2017 at 1:14 PM
451 KB



Keynote
3 items



Numbers
16 items



Pacific Crest Trail
Aug 26, 2016 at 2:00 AM
1.8 MB



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0 items

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9:41 Mon Jun 4

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School projects

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Beach
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10.4 MB



Dad and Jimmy
May 2, 2017 at 2:23 PM
2.7 MB



Desktop
10 items



Documents
77 items



Half Dome
1, 2017 at 5:31 PM
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Apr 11, 2017 at 1:14 PM
451 KB



Keynote
3 items



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Pacific Crest Trail
Aug 26, 2016 at 2:00 AM
1.8 MB



Pages
0 items

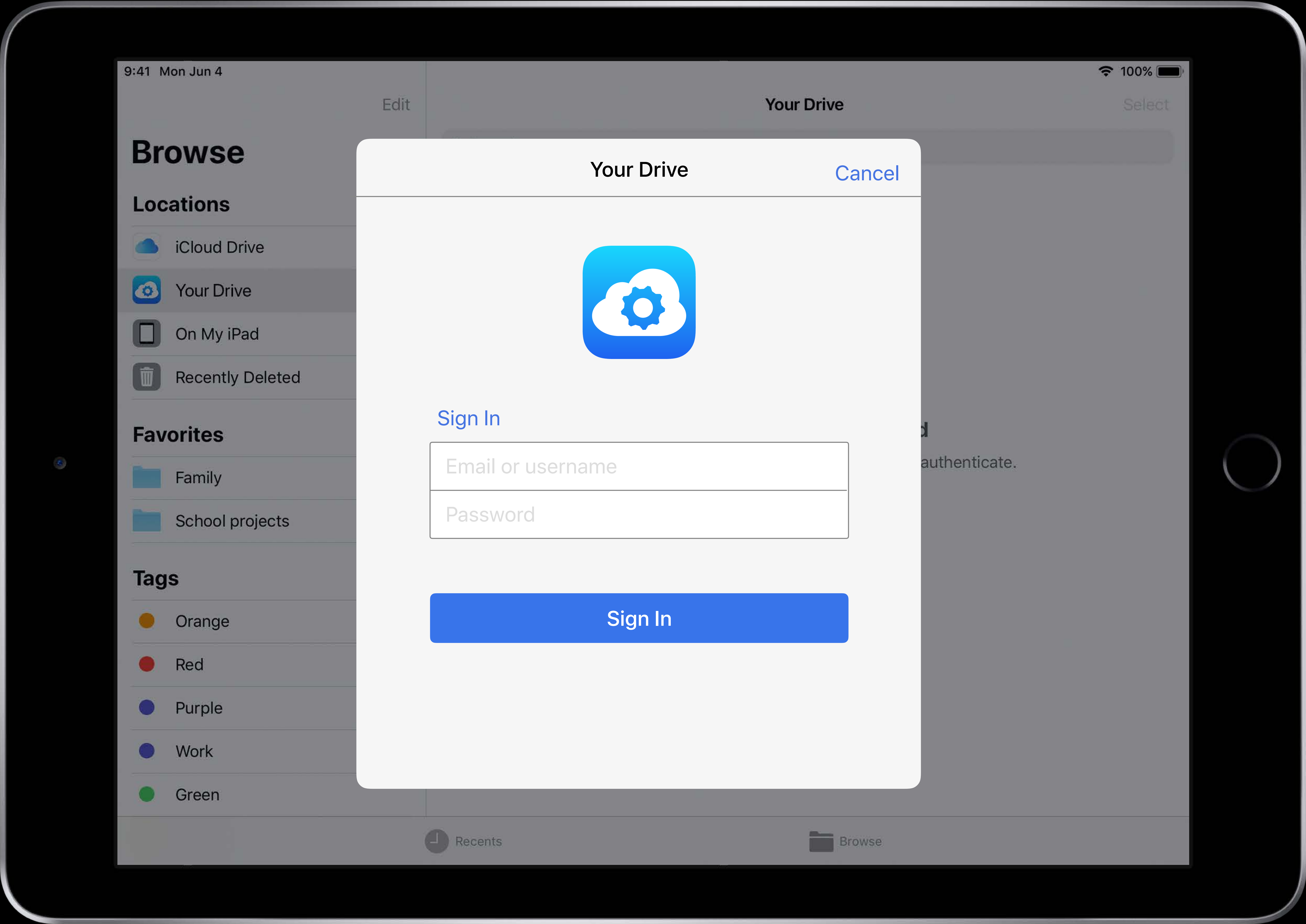
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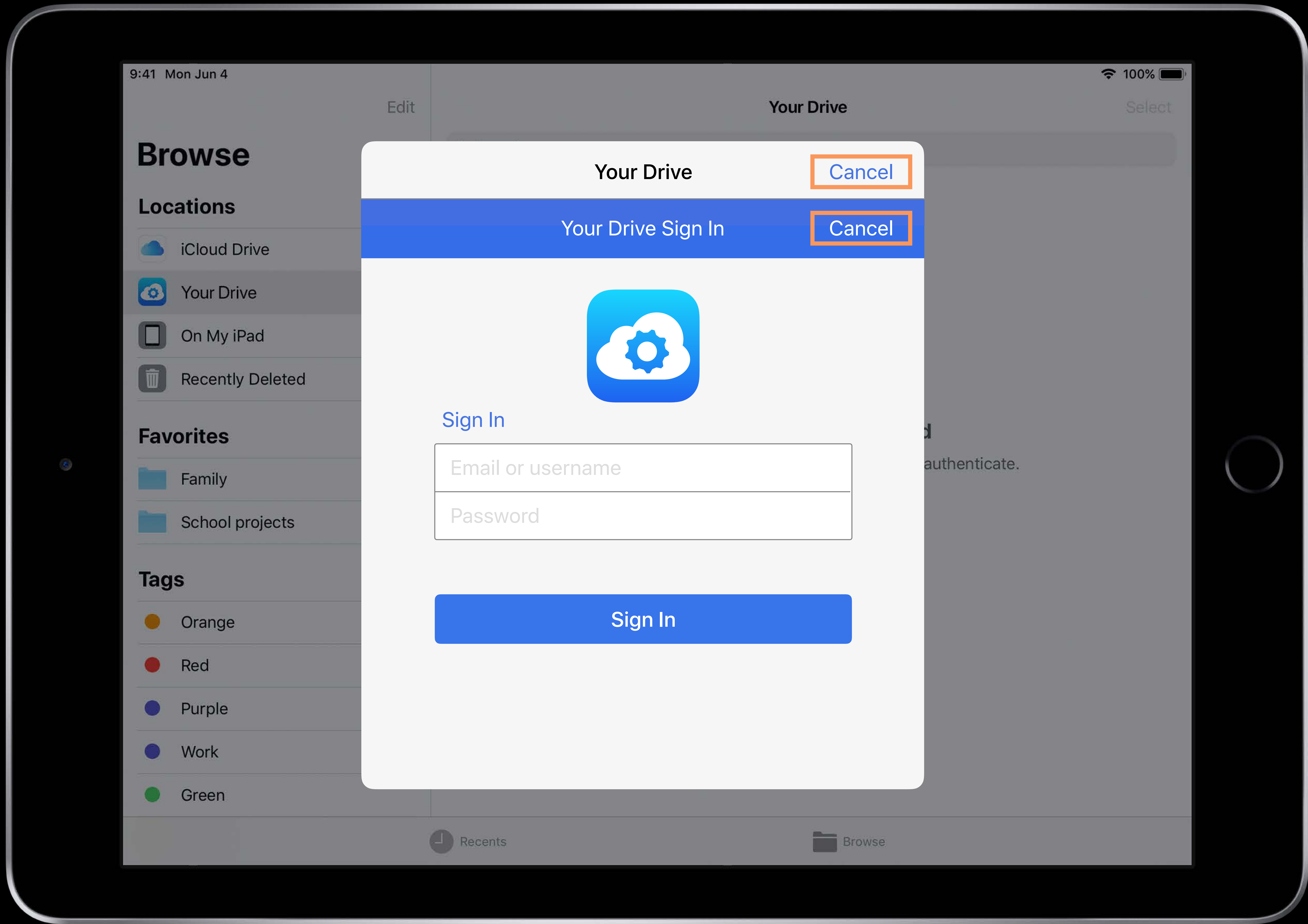
Browse

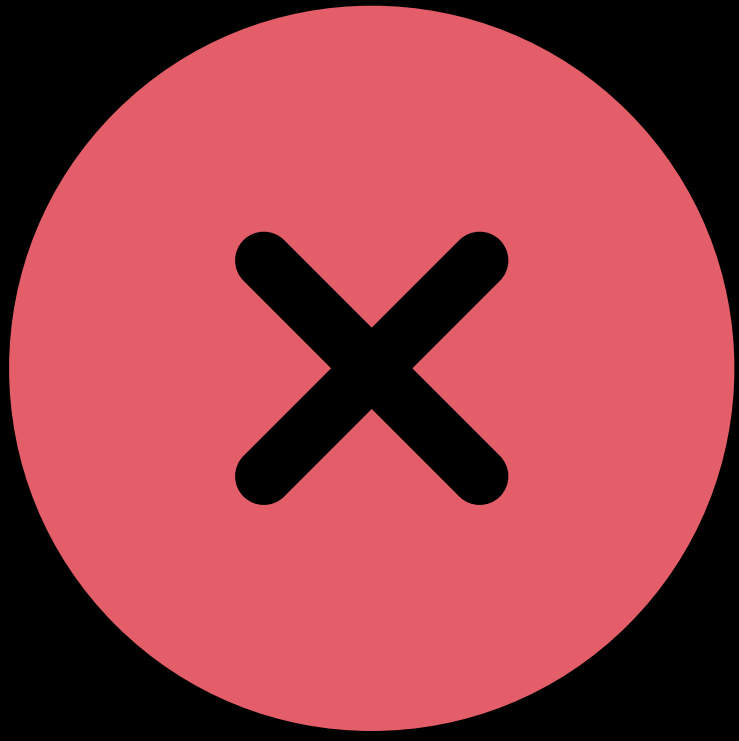
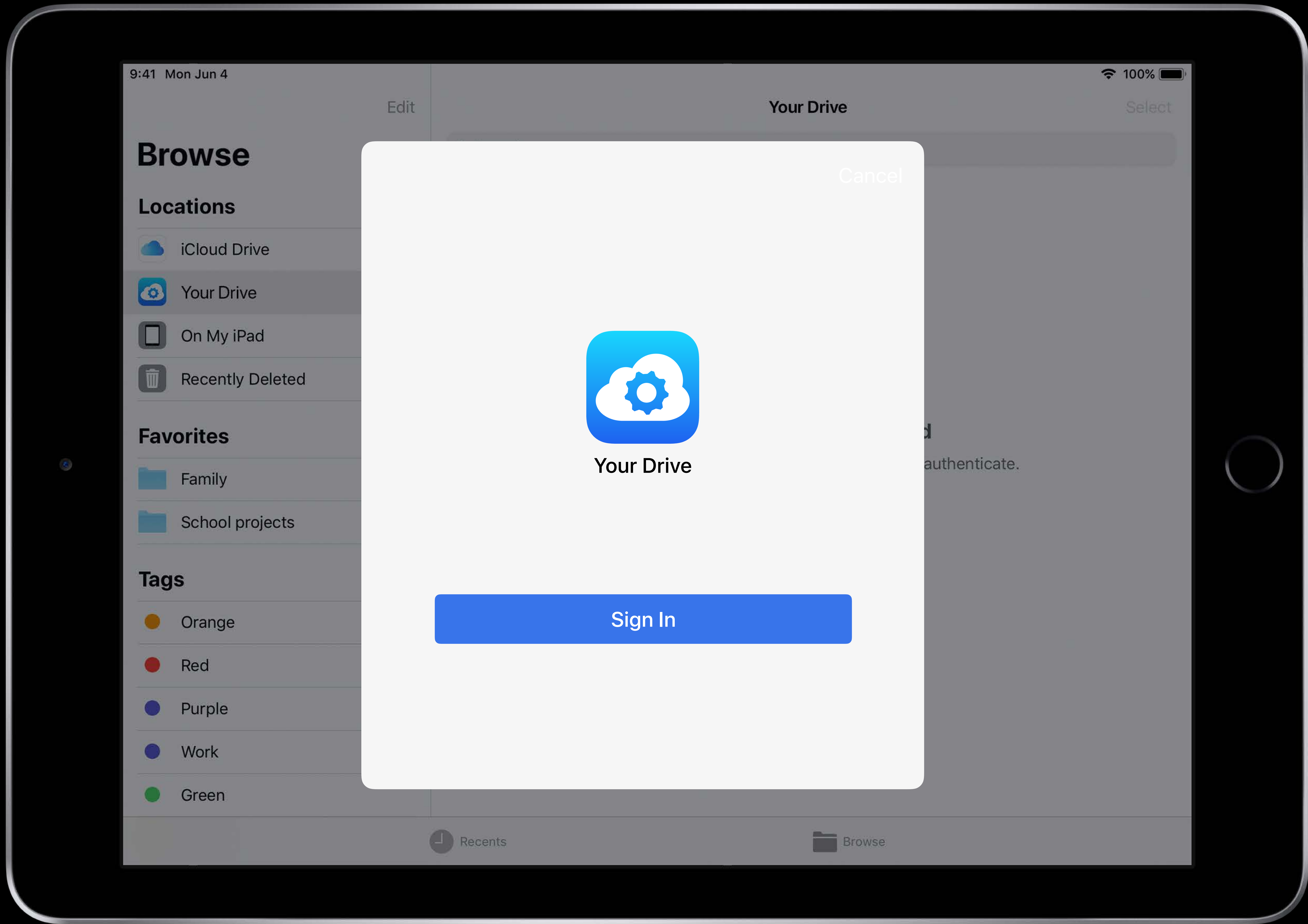
Document Management on iOS

File Provider UI

Sign in to your service using `FPUIActionExtensionViewController`





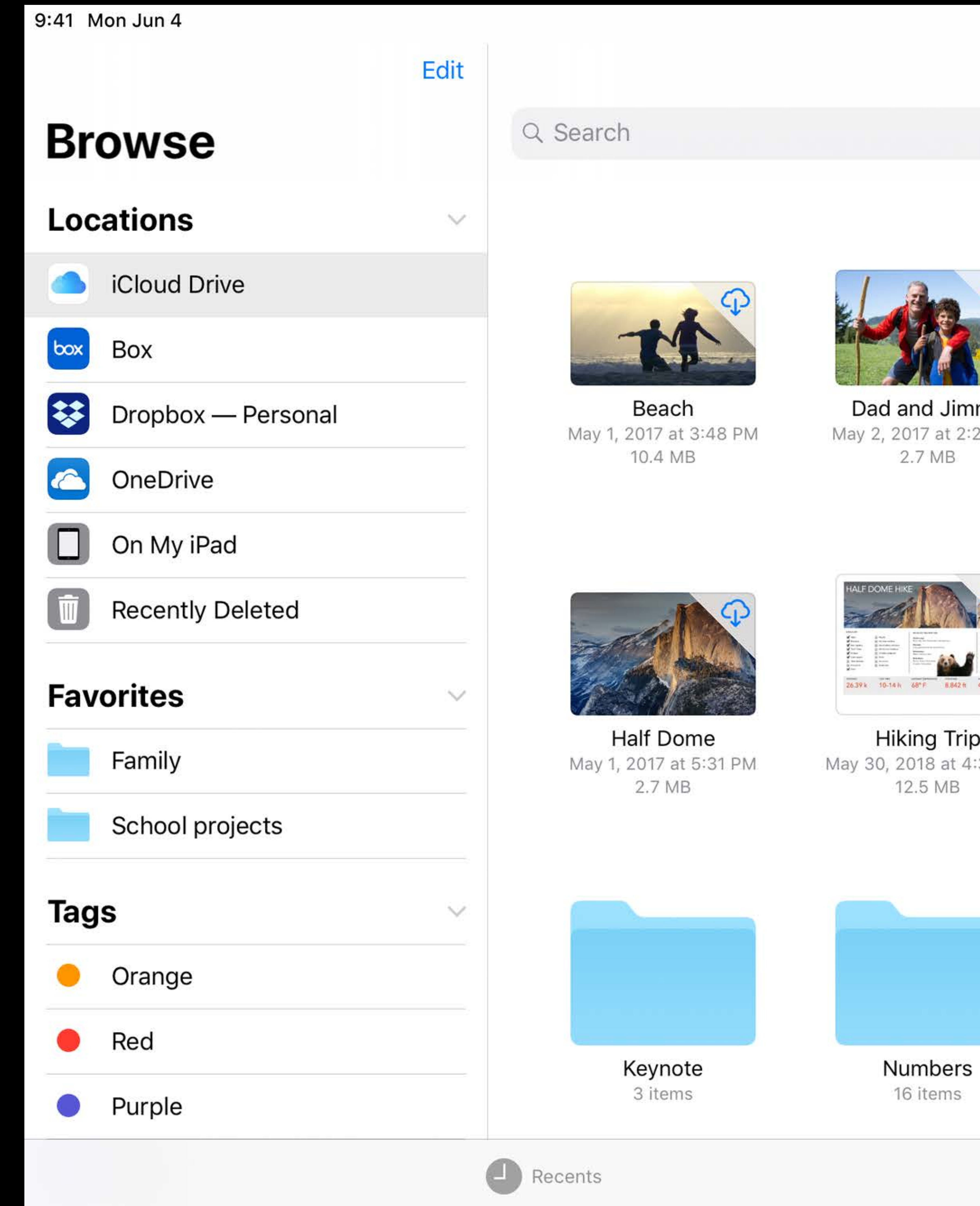


Document Management on iOS

File Provider adoption

Great adoption from cloud vendors and application developers

Try adopting `UIDocumentBrowserViewController` or creating a File Provider extension today!



What's New?

Document Management on iOS

File Provider–Validation tool

NEW

File Provider Validation tests your FileProvider Extension and guides you to fix the issues

<https://developer.apple.com/download/more/>



Document Management on iOS

File Provider–Validation tool

NEW

Download includes

- Source files to add to your project to enable testing
- An iOS app to run on your iPad

Modify your File Provider project

Install File Provider Validation on your device and launch it



File Provider Validation



Your Drive

File Provider Validation

This application provides a way to validate that your File Provider Extension conforms to certain expectations that the system makes. It runs a series of tests ("Validations"). Most of the validations are following a similar pattern:

- create a file system item
- wait for the item to show up
- perform an action on the item
- wait for the results of the action to show up

To pass the validation, each of the steps needs to succeed. Apart from up-front failure (e.g. because an action reports an error), a common issue is that the extension doesn't post the appropriate signals (e.g. on the item's parent container and on the working set) or that after the signals are posted, the corresponding collection doesn't reflect the new state (e.g. the action quietly failed).

Enabling Validations

Only extensions that have opted into allowing validations can be selected. To opt into validation, your extension must vend a specific service on the root item of your collection (`NSFileProviderRootContainerItemIdentifier`). Refer to the readme file included in the distribution for more details.

ATTRIBUTE VALIDATION

Tags (RootContainer) ✓ Passed

Tags (Folder) ✗ Failed

Last Used Date (RootContainer) ✓ Passed

Last Used Date (Folder) ✗ Failed

Favorite Rank (RootContainer) ✓ Passed

Favorite Rank (Folder) ✗ Failed

Rename (RootContainer) ✓ Passed

Rename (Folder) ✗ Failed

Reparent (RootContainer) ✓ Passed

Reparent (Folder) ✗ Failed

Download Evict ✗ Failed

Looking up container NSFileProviderRootContainerItemIdentifier
✓ Found iCloud Drive id:NSFileProviderRootContainerItemIdentifier modified: 2018-05-31 00:21:17 +0000 (1527726077)

Create folder ValidationFolder-WinterHappyMayBlack in container NSFileProviderRootContainerItemIdentifier
✓ Created ValidationFolder-WinterHappyMayBlack id:i175eea9 0.0% 0 children modified: 2018-05-31 00:21:17 +0000 (1527726077)

Expecting signal (any), properties filename: ValidationFolder-WinterHappyMayBlack, parentItemIdentifier: NSFileProviderRootContainerItemIdentifier, pending: 0, typeIdentifier: public.folder on events for NSFileProviderRootContainerItemIdentifier
✓ Fulfilled by update on ValidationFolder-WinterHappyMayBlack id:i175eea9 0.0% 0 children modified: 2018-05-31 00:21:17 +0000 (1527726077)

Looking up container i175eea9
✓ Found ValidationFolder-WinterHappyMayBlack id:i175eea9 modified: 2018-05-31 00:21:17 +0000 (1527726077)

Container i175eea9 doesn't allow creating subitems
✗ (unknown error)

Document Management on iOS

File Provider–Siri Shortcuts



NEW

Surfaces documents that were recently opened or created in Search and the Lock Screen

You can also add a shortcut to Siri

9:41 Mon Jun 4

100%

Search

Cancel

SIRI SUGGESTIONS



Stocks



Calendar



Messages



Camera



Clock



Smithsonian

Files

100%

9:41
Monday, June 4

FILES | SIRI SUGGESTION
Smithsonian

Press home to open



Document Management on iOS

File Provider–Siri Shortcuts

NEW

Add `NSFileProviderUsesUniqueltemIdentifiersAcrossDevices` to your File Provider Extension's Info.plist

Key	Type	Value
Information Property List	Dictionary	(11 items)
Localization native development region	String	\$(DEVELOPMENT_LANGUAGE)
Bundle display name	String	DocFileProvider
Executable file	String	\$(EXECUTABLE_NAME)
Bundle identifier	String	\$(PRODUCT_BUNDLE_IDENTIFIER)
InfoDictionary version	String	6.0
Bundle name	String	\$(PRODUCT_NAME)
Bundle OS Type code	String	XPC!
Bundle versions string, short	String	1.0
Bundle version	String	1
NSExtension	Dictionary	(4 items)
NSFileProviderUsesUniqueltemIdentifiersAcrossDevices	Boolean	YES

Document Management on iOS

File Provider–Siri Shortcuts

NEW

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Information Property List	Dictionary	(11 items)
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Executable file	String	\$(EXECUTABLE_NAME)
Bundle identifier	String	\$(PRODUCT_BUNDLE_IDENTIFIER)
InfoDictionary version	String	6.0
Bundle name	String	\$(PRODUCT_NAME)
Bundle OS Type code	String	XPC!
Bundle versions string, short	String	1.0
Bundle version	String	1
NSExtension	Dictionary	(4 items)
NSFileProviderUsesUniqueltemIdentifiersAcrossDevices	Boolean	YES

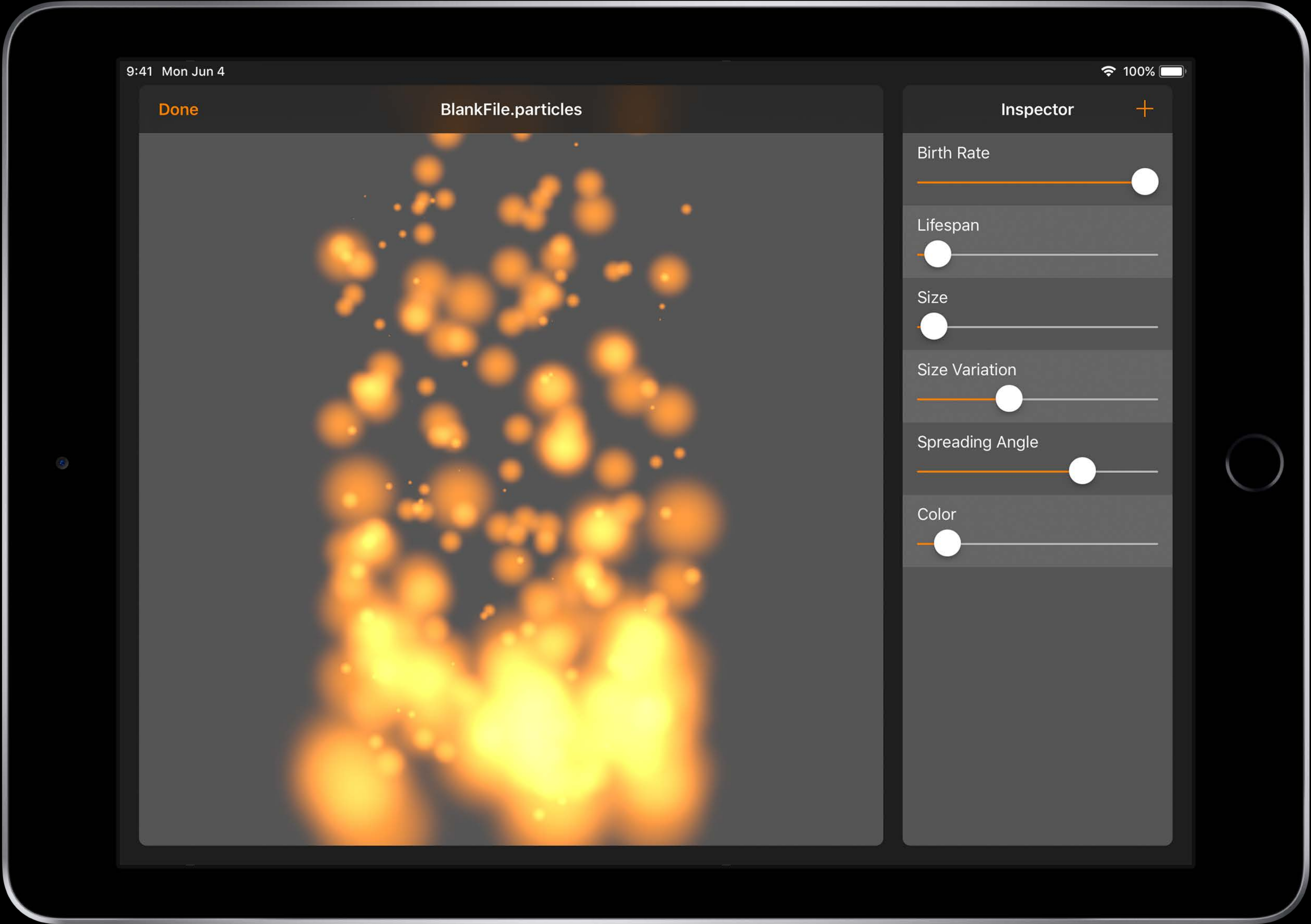
Document Management on iOS

Particles sample app



NEW

NEW



Document Management on iOS

Particles sample app

NEW



Document Management on iOS

Particles sample app

NEW

Main UI is a UIDocumentBrowserViewController



Document Management on iOS

Particles sample app

Main UI is a UIDocumentBrowserViewController

Defines a file format

NEW



Document Management on iOS

Particles sample app

Main UI is a `UIDocumentBrowserViewController`

Defines a file format

Implements state restoration

NEW



Document Management on iOS

Particles sample app

NEW

Main UI is a UIDocumentBrowserViewController

Defines a file format

Implements state restoration

Import assets using UIDocumentPickerViewController



Document Management on iOS

Particles sample app

NEW

Main UI is a `UIDocumentBrowserViewController`

Defines a file format

Implements state restoration

Import assets using `UIDocumentPickerViewController`

Available at <https://developer.apple.com/download/more/>



Interacting with Documents in Your App

Thomas Deniau, Software Engineer

Document picker and document browser

Document picker and document browser

Demo—add a document picker to an existing app

Document picker and document browser

Demo—add a document picker to an existing app

Document types

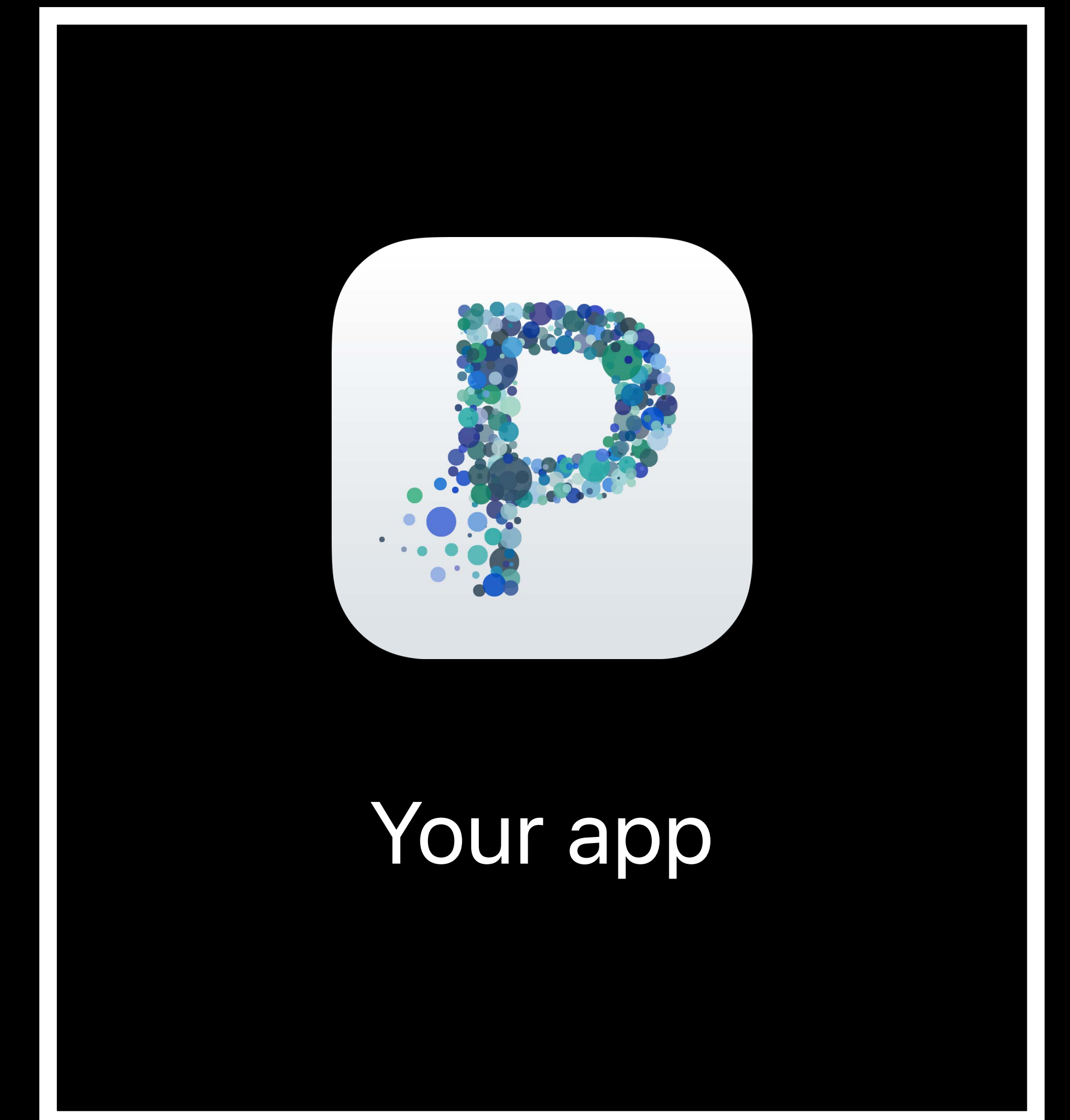
Interacting with Documents

What does it mean?

Interacting with Documents

What does it mean?

Providing UI to let your customers organize their documents

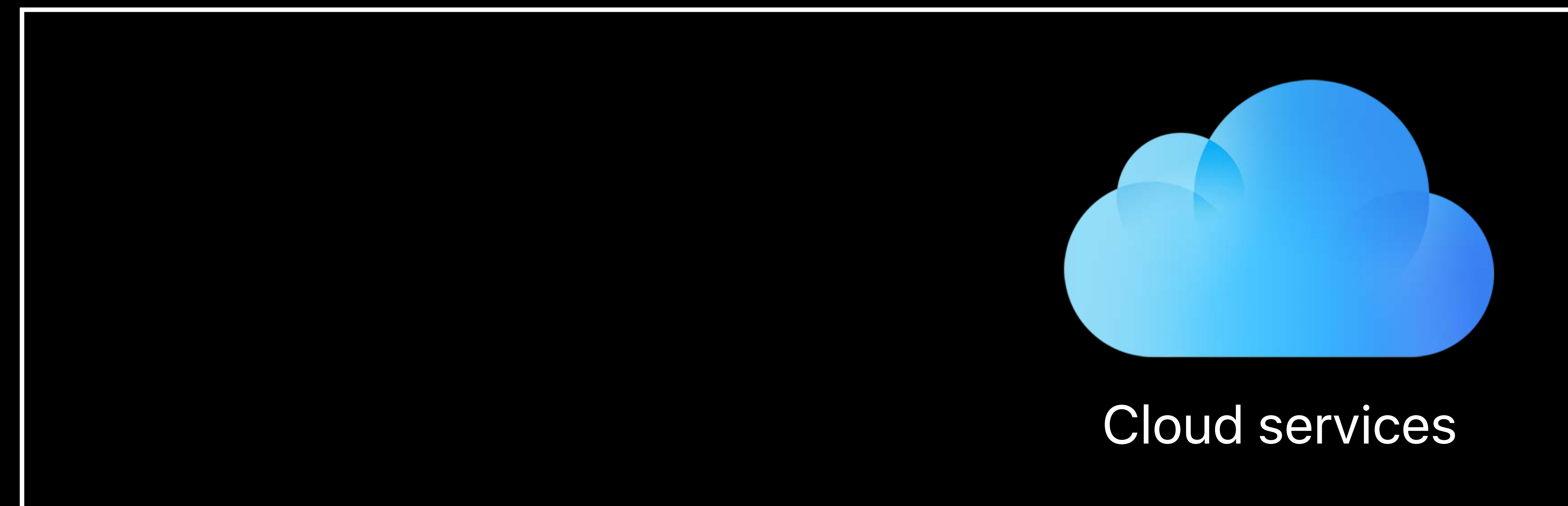
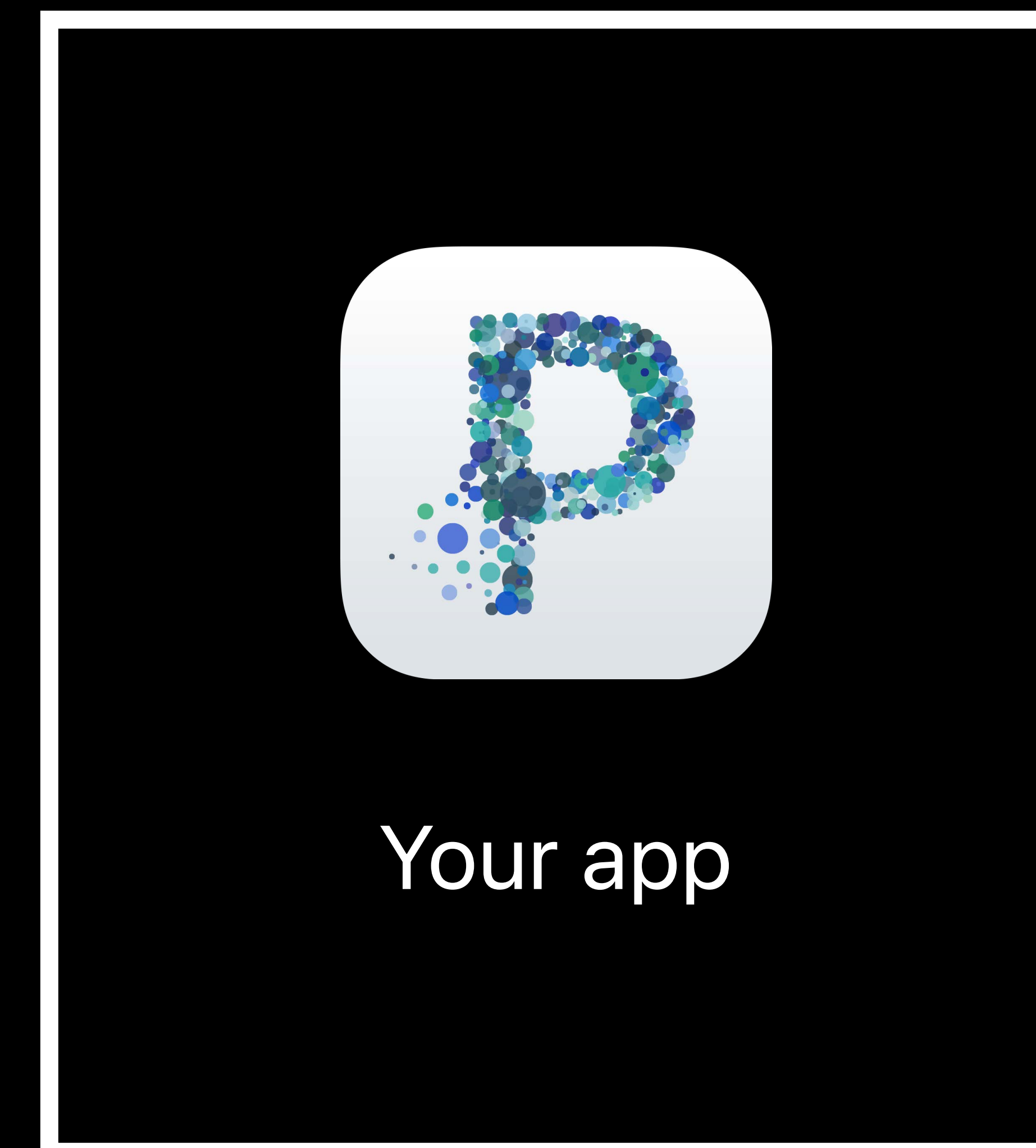


Interacting with Documents

What does it mean?

Providing UI to let your customers organize their documents

Accessing documents stored in the cloud



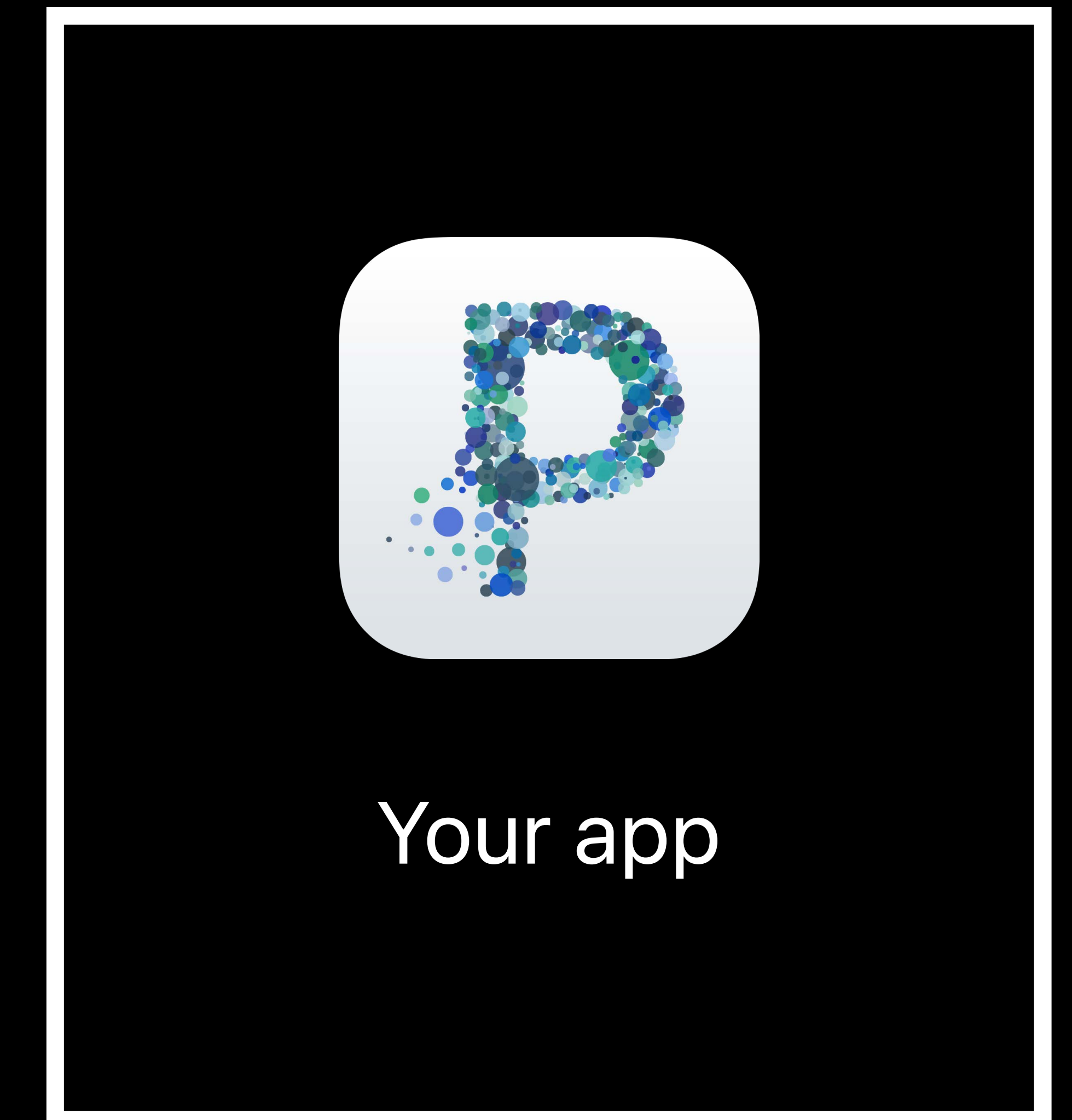
Interacting with Documents

What does it mean?

Providing UI to let your customers organize their documents

Accessing documents stored in the cloud

Accessing documents from another app



Other apps' containers



Cloud services

Document Picker vs Document Browser

Document Picker

Document Browser

Document Picker vs Document Browser

Document Picker

Document Browser

Browse local and cloud storage



Document Picker vs Document Browser

Document Picker

Document Browser

Browse local and cloud storage



Access files from other apps



Document Picker vs Document Browser

Document Picker

Document Browser

Browse local and cloud storage



Access files from other apps



Use case

Quick User Action

Main document browsing UI of your app

Document Browser

Main document browsing UI
of a document-based application



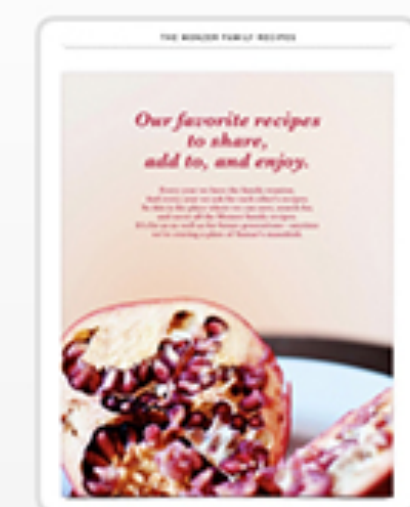
Pages Recents

Search

See All



Science Fair
18:16



Lebanese Family Recipes
18:16



Next City Cycles
18:15



Kite Flyers
18:15



Grove Surfboards
18:15



Easy Rides Custom Bikes
18:14

School

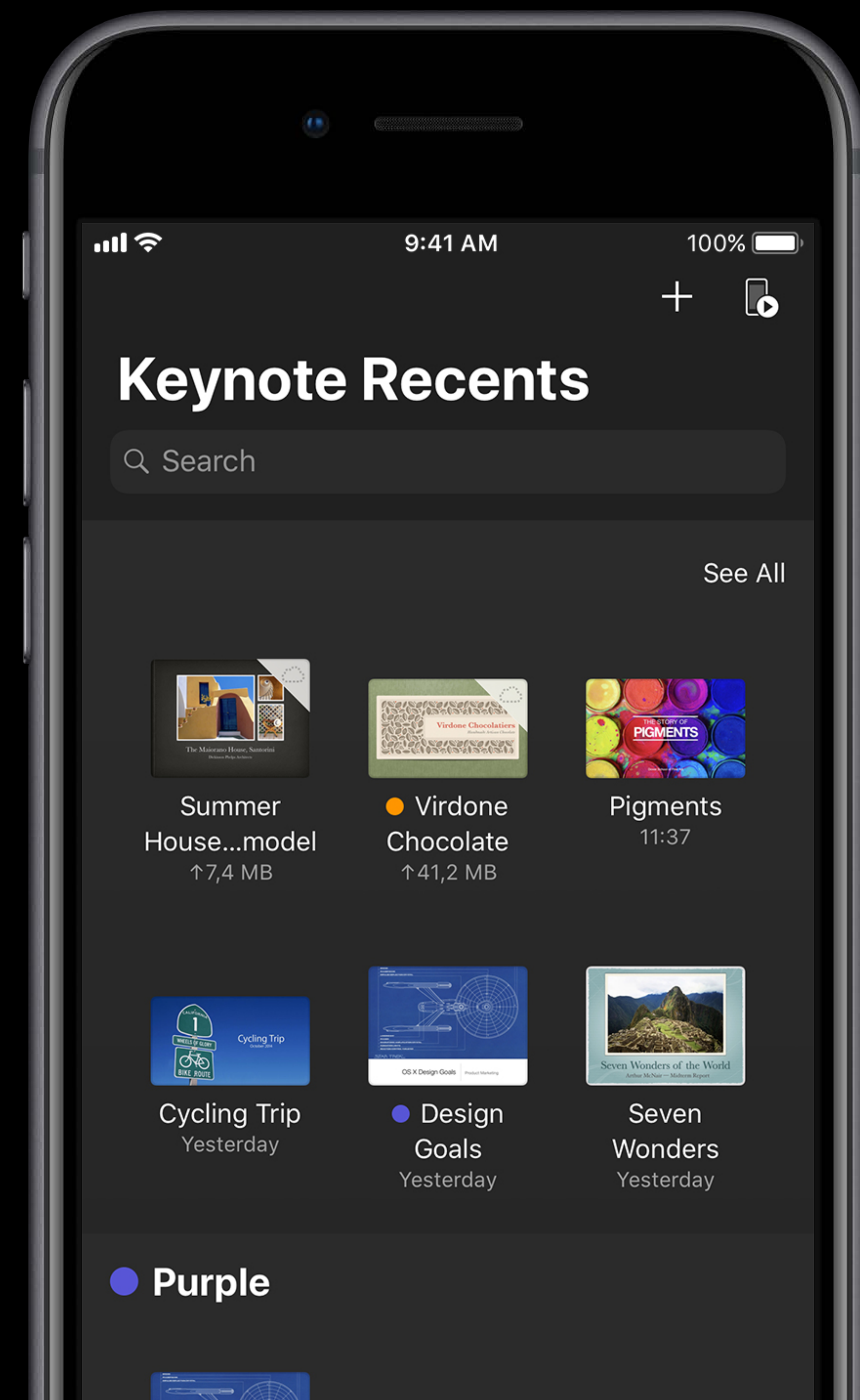


Recents

Browse

UIDocumentBrowserViewController

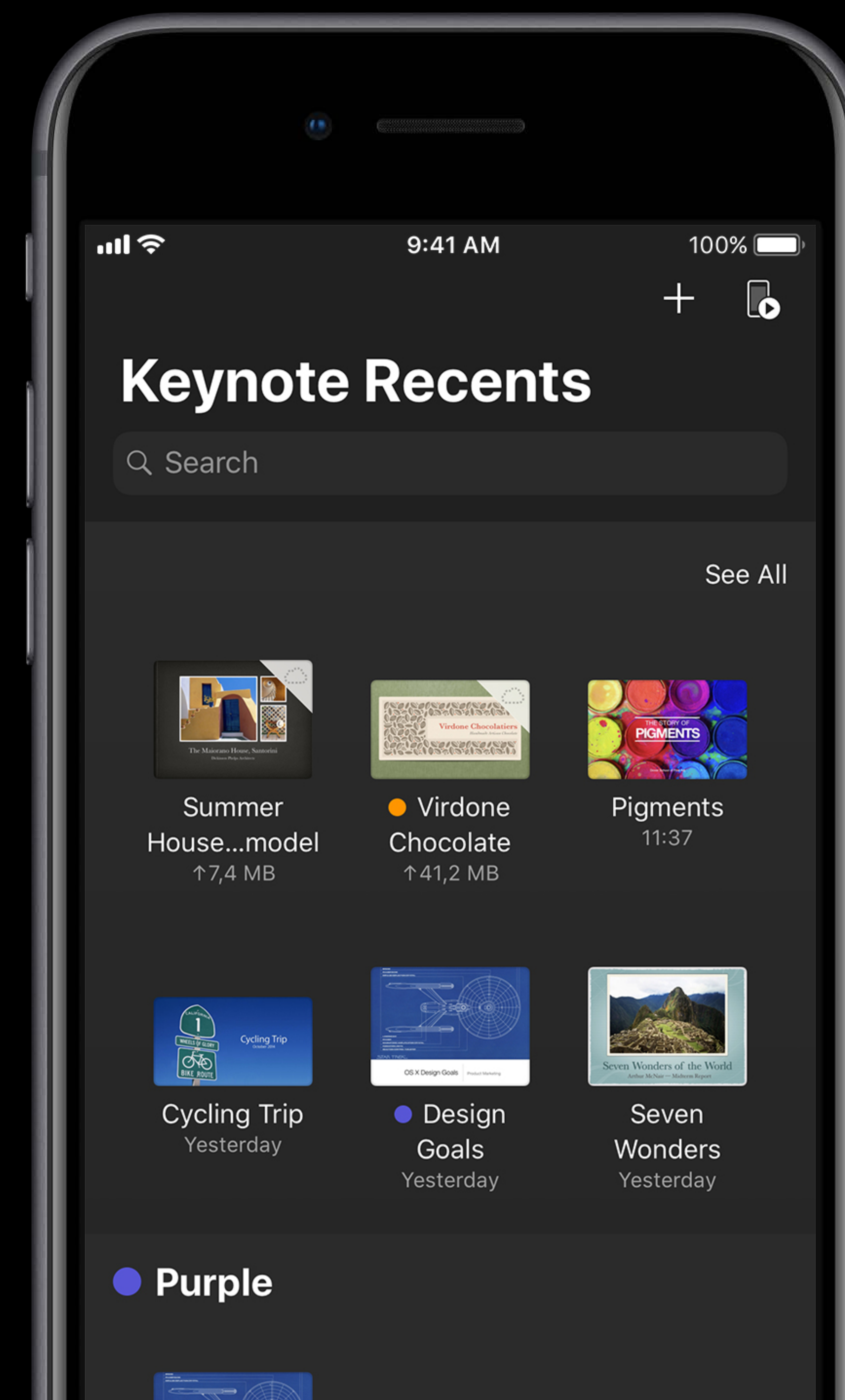
Starting point of your app



UIDocumentBrowserViewController

Starting point of your app

Full screen

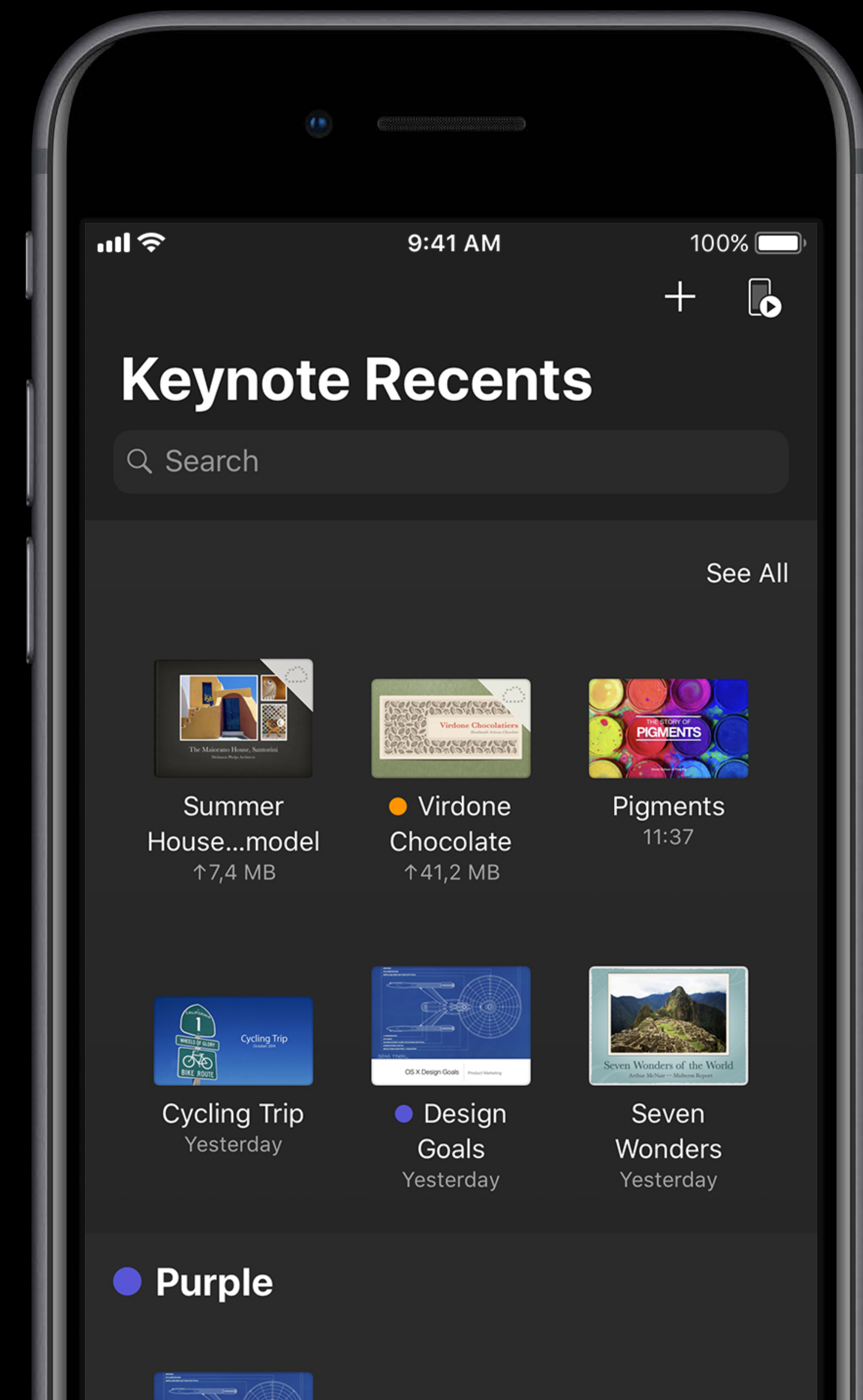


UIDocumentBrowserViewController

Starting point of your app

Full screen

Open and organize your documents



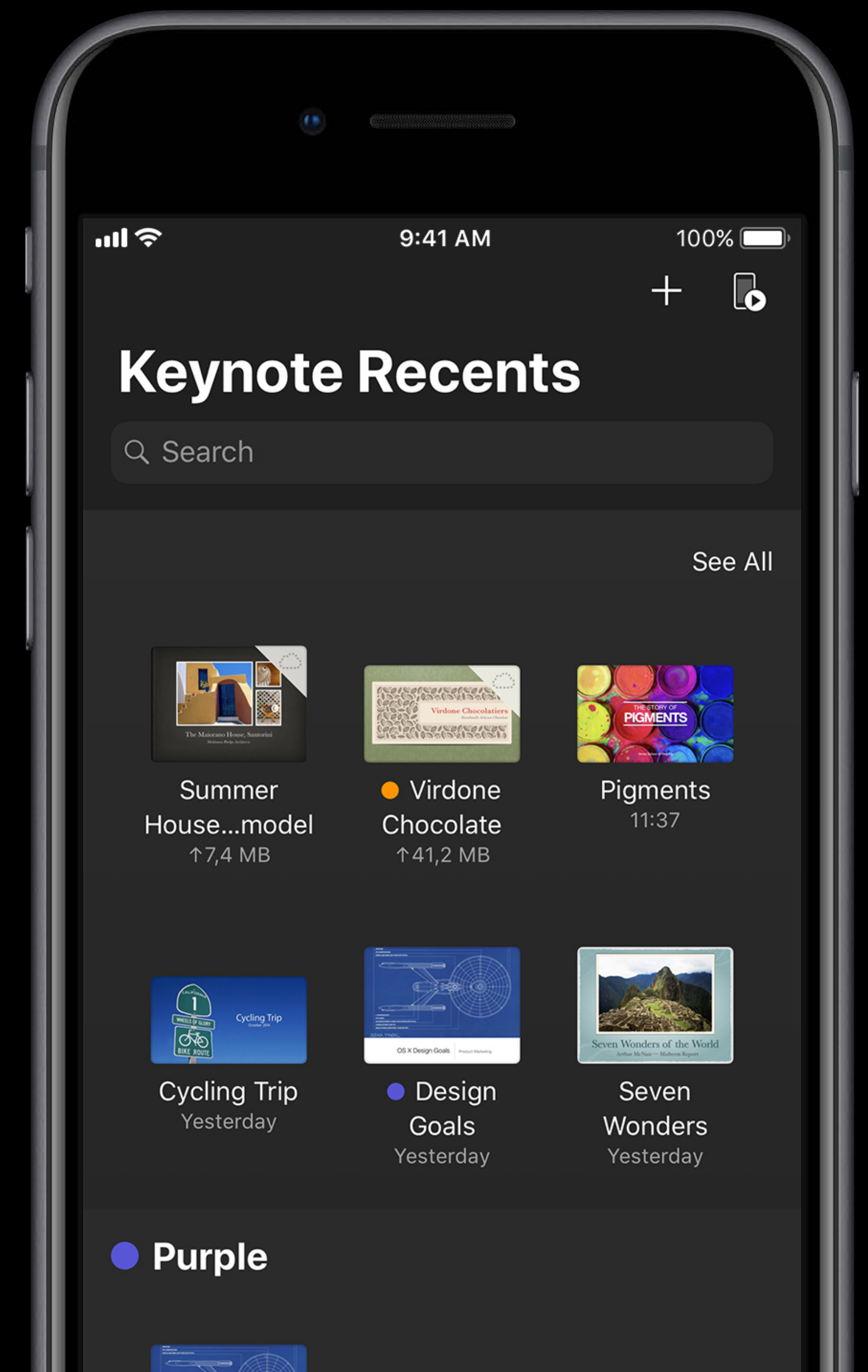
UIDocumentBrowserViewController

Starting point of your app

Full screen

Open and organize your documents

All the features of the Files App



UIDocumentBrowserViewController

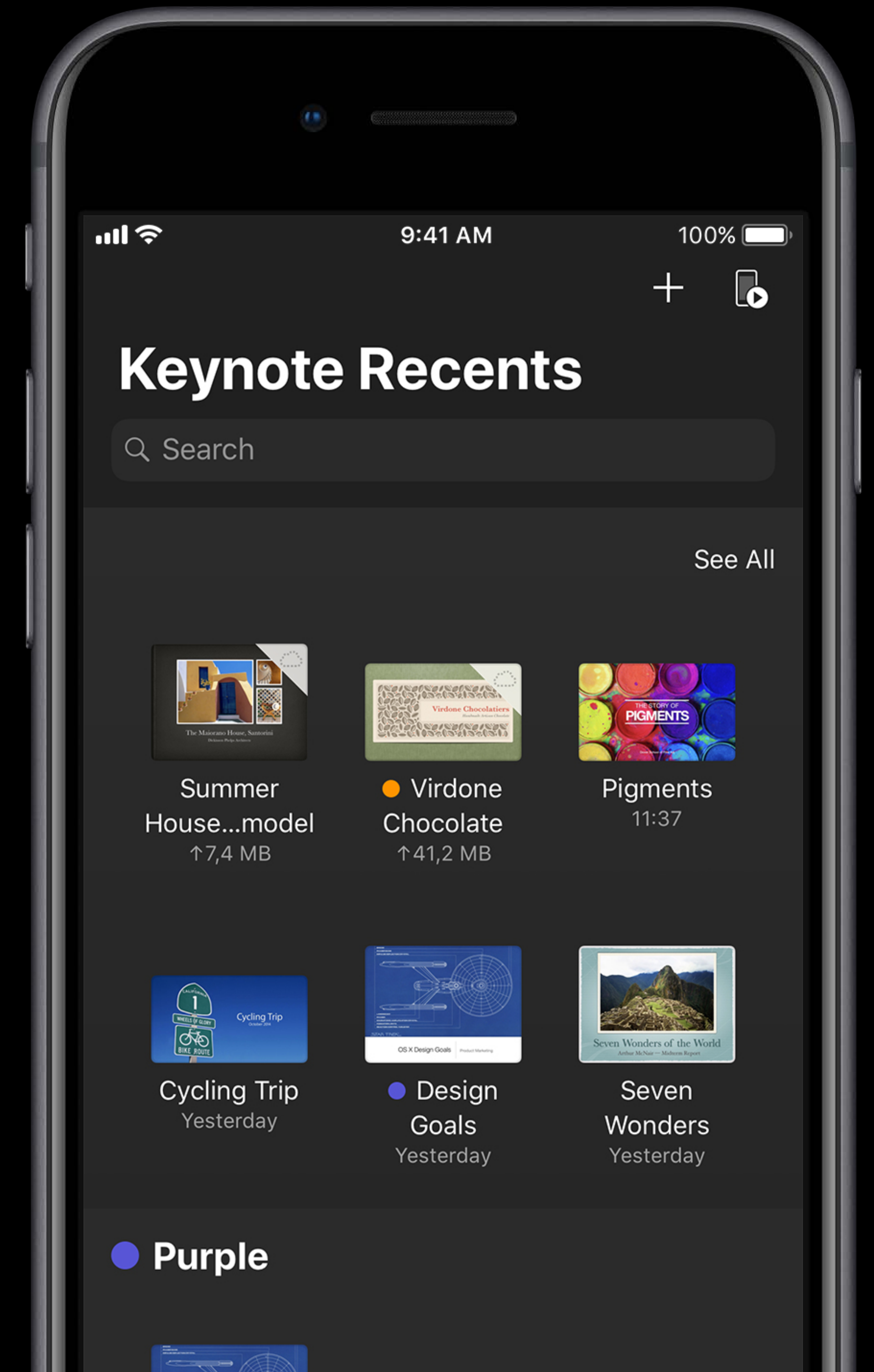
Starting point of your app

Full screen

Open and organize your documents

All the features of the Files App

Can be customized



UIDocumentBrowserViewController

Starting point of your app

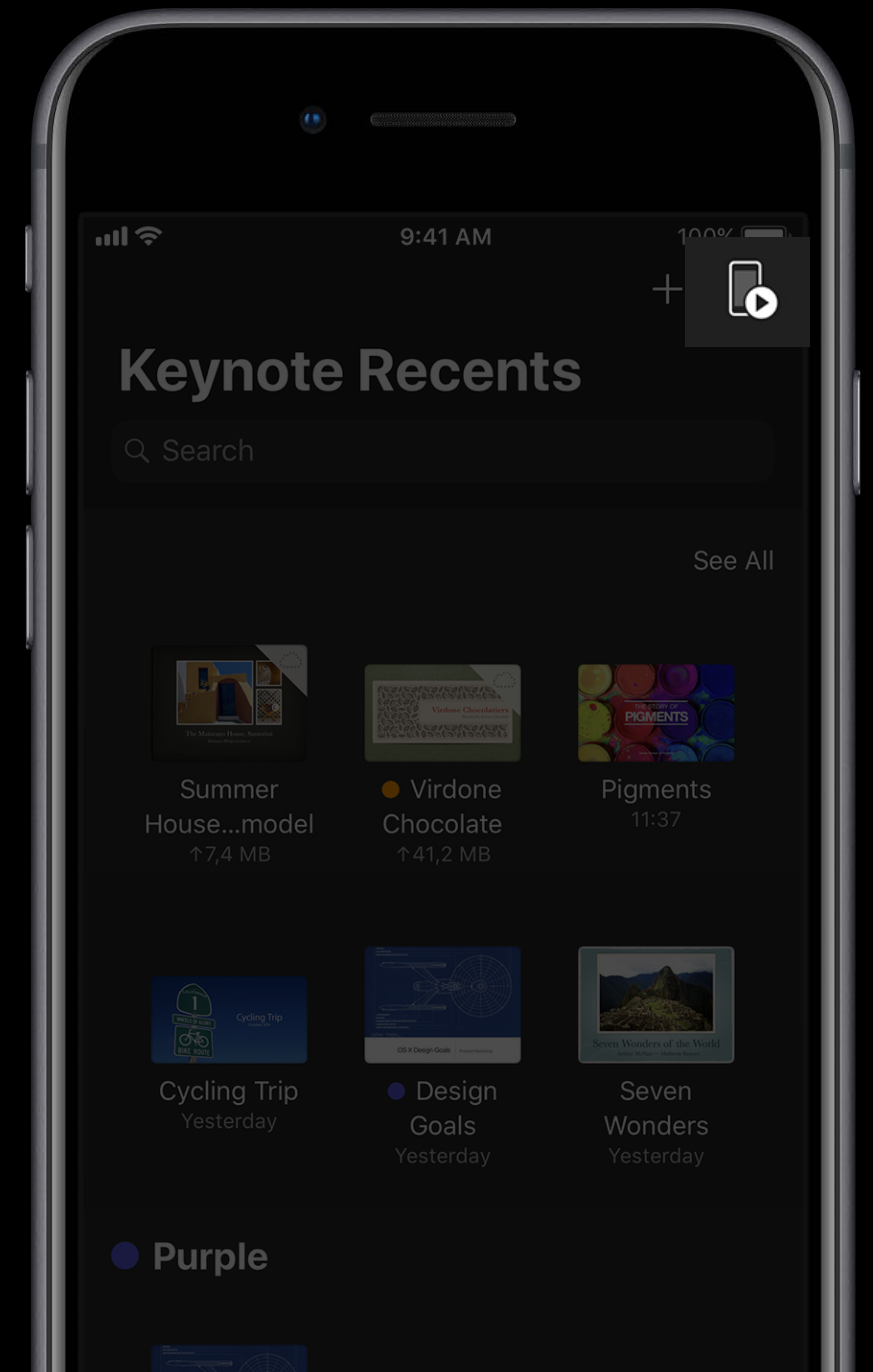
Full screen

Open and organize your documents

All the features of the Files App

Can be customized

- With your own buttons



UIDocumentBrowserViewController

Starting point of your app

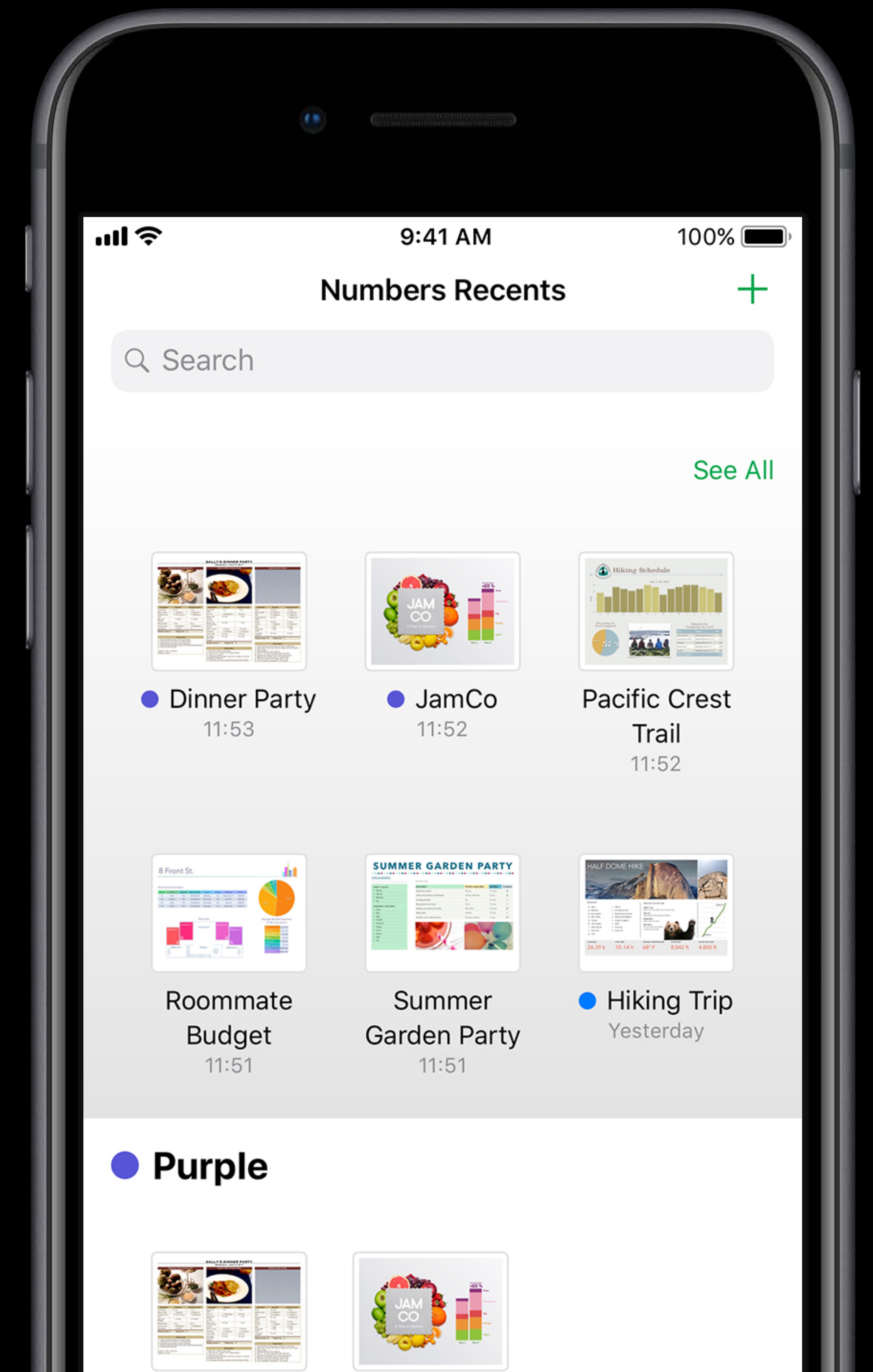
Full screen

Open and organize your documents

All the features of the Files App

Can be customized

- With your own buttons
- To match your app's look



UIDocumentBrowserViewController

Starting point of your app

Full screen

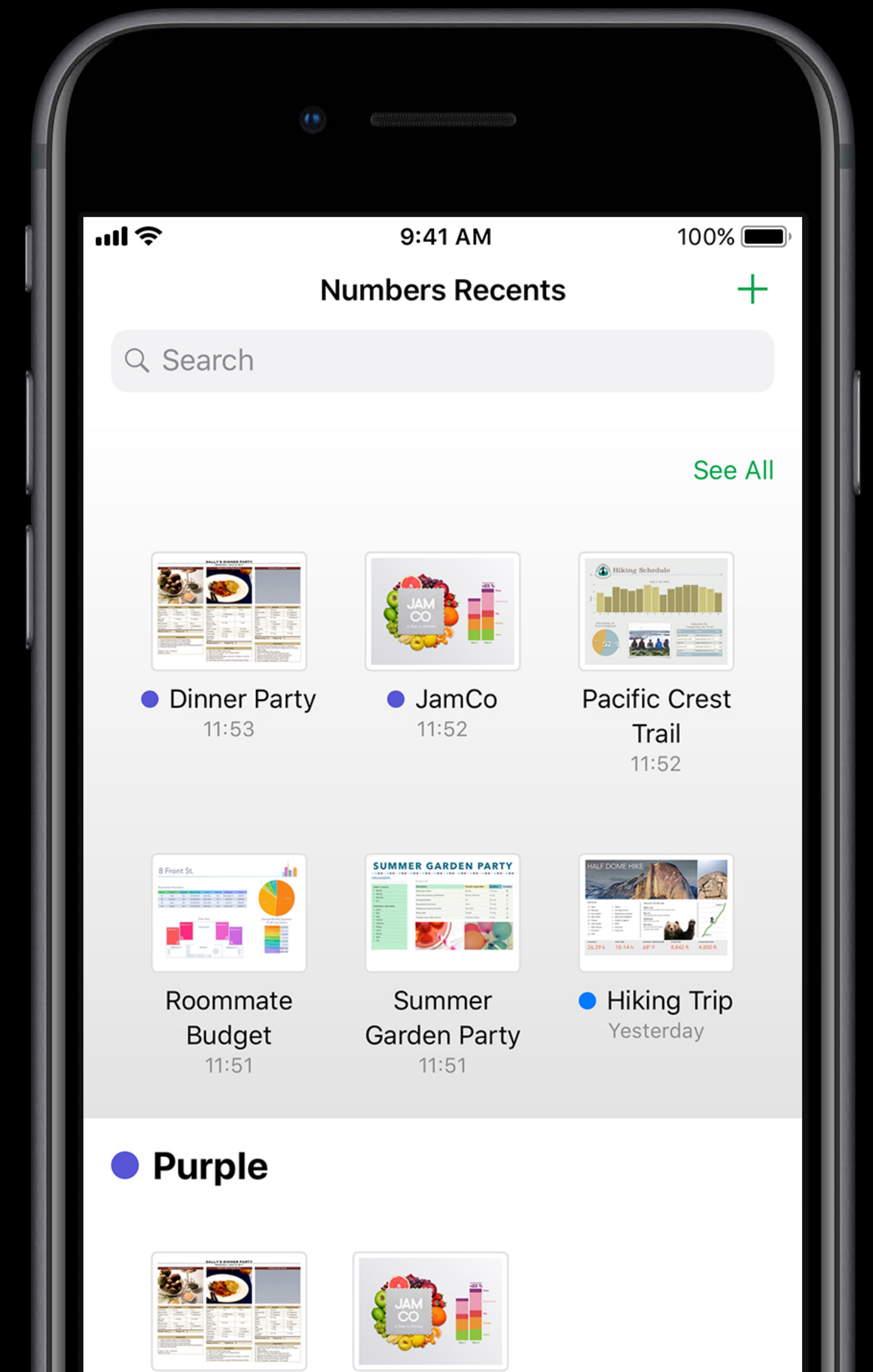
Open and organize your documents

All the features of the Files App

Can be customized

- With your own buttons
- To match your app's look

Present your own UI on top



UIDocumentBrowserViewController

The Document Browser is the entry point of your app

Best practice is to make it the root view controller

UIDocumentBrowserViewController

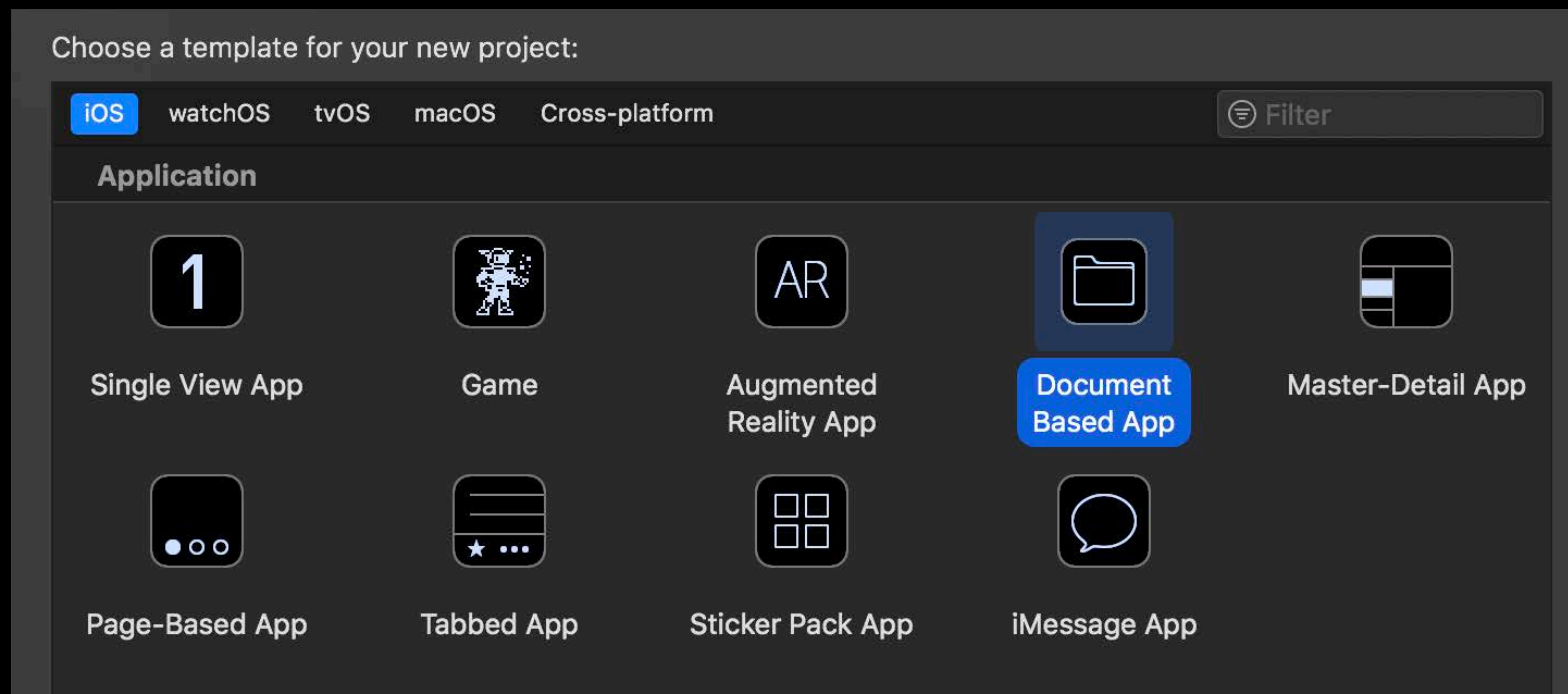
The Document Browser is the entry point of your app

Best practice is to make it the root view controller

Can also be presented full screen

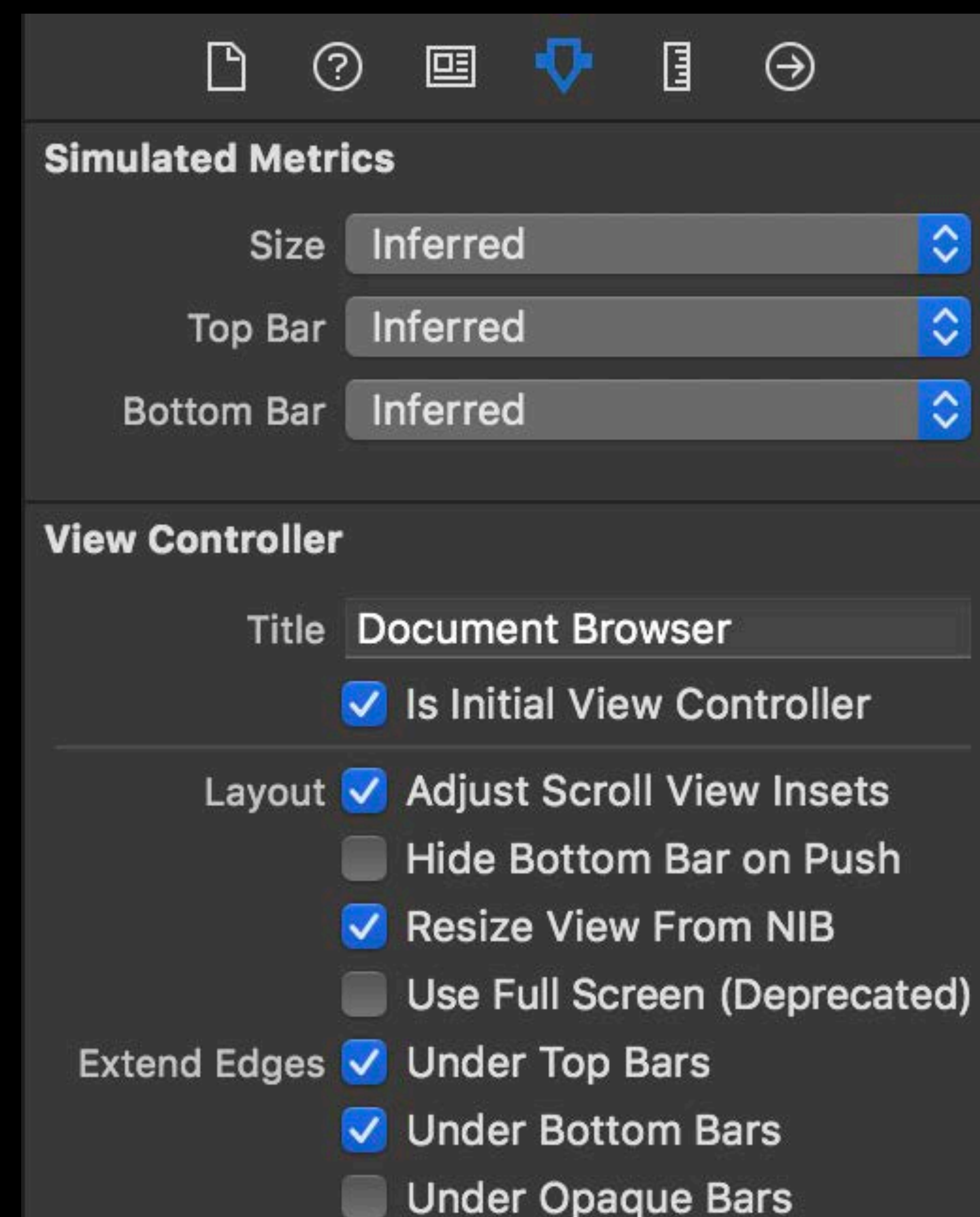
UIDocumentBrowserViewController

Getting started



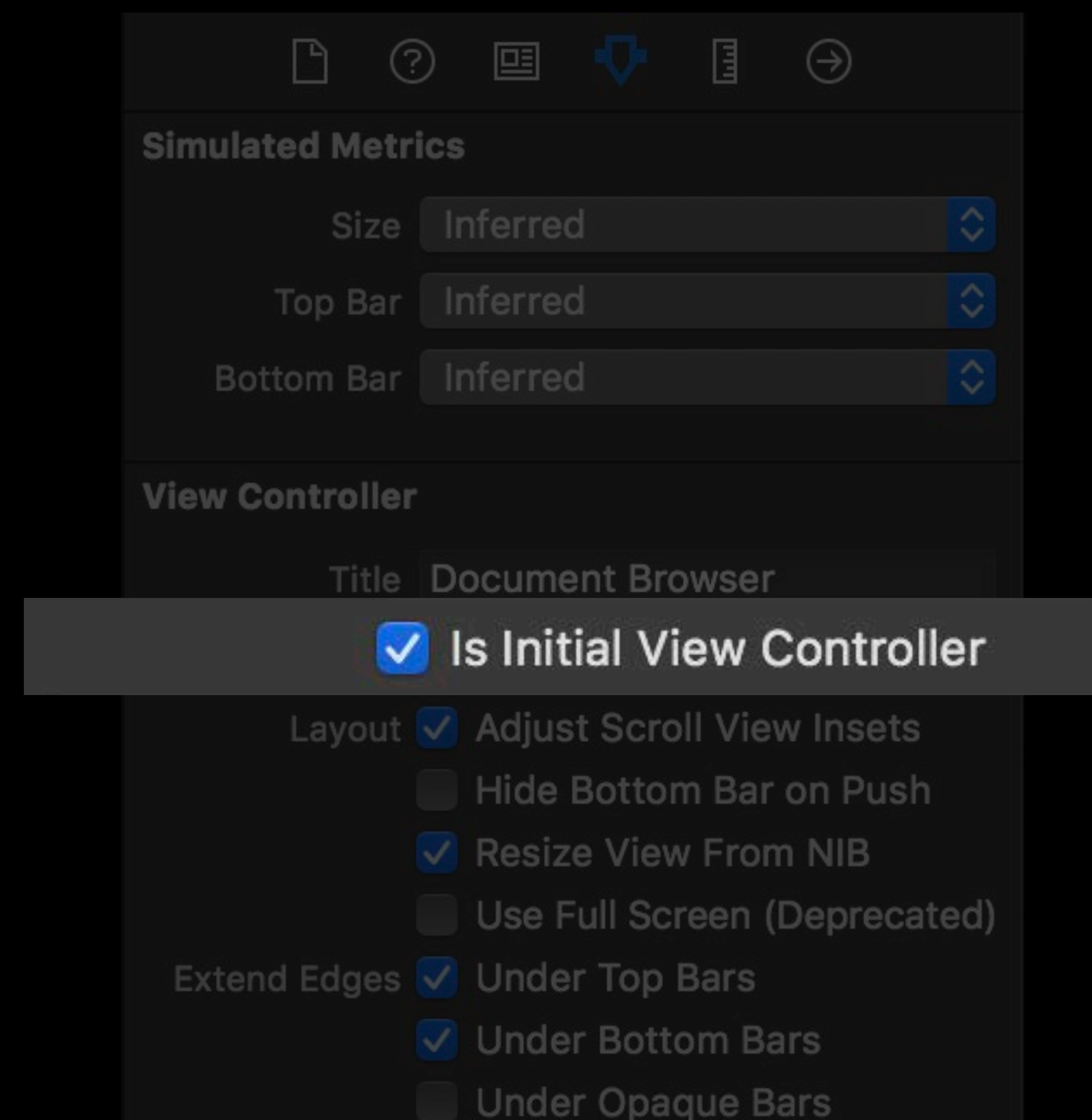
UIDocumentBrowserViewController

Getting started



UIDocumentBrowserViewController

Getting started



UIDocumentBrowserViewController

Customization

UIDocumentBrowserViewController

Customization

Add your own buttons

UIDocumentBrowserViewController

Customization

Add your own buttons

Set colors and themes

UIDocumentBrowserViewController

Customization

Add your own buttons

Set colors and themes

Customize the open/close document animations

UIDocumentBrowserViewController

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Customize the open/close document animations

UIDocumentBrowserViewController

Customization

Add your own buttons

Set colors and themes

Customize the open/close document animations

Sample code available

Document Picker

Open an asset stored in the cloud
or in another app

9:41 Mon Jun 4 100%

Mailboxes **Int** Details A

New Message Send

Cancel



Subject:


Hi Alex,

Here is the file you wanted

Select Select All Quote Level Insert Photo or Video Add Attachment Insert Drawing



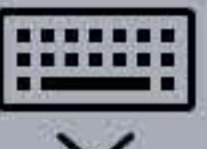
Voici le nouvel iPad.

To For Me **B/U**  

Q W E R T Y U I O P 

A S D F G H J K L return

↑ % - + = / ; : ! , ? . ↑

 .?123  .?123 

9:41 Mon Jun 4

100%

Mailboxes

Cancel New Message Send

Subject:

Hi Alex,

Here is the file you wanted

- Select
- Select All
- Quote Level
- Insert Photo or Video
- Add Attachment
- Insert Drawing

Apple

Voici le nouvel iPad

Le nouvel 9.7 pouce

To For Me B/U

Q W E R T Y U I O P

A S D F G H J K L return

↑ Z X C V B N M , . ?

😊 .?123 🎤 .?123 📄

9:41 Mon Jun 4

100%

Mailboxes

Apple
Votre identifi
Chère/Cher Th
identifiant App

Apple
Apple Watch S
Répondez à un
planche de sur

App Store
Se muscler sar
Nos articles et
RECOMMANDÉ

iBooks
Suspenses et t
Il arrive bientôt
Guillaume Mus

Apple
Votre identifi
Chère/Cher Th
identifiant App

Apple
Voici le nouvel
Le nouvel 9,7 p
Toute la puissa



Up

Recents

Cancel

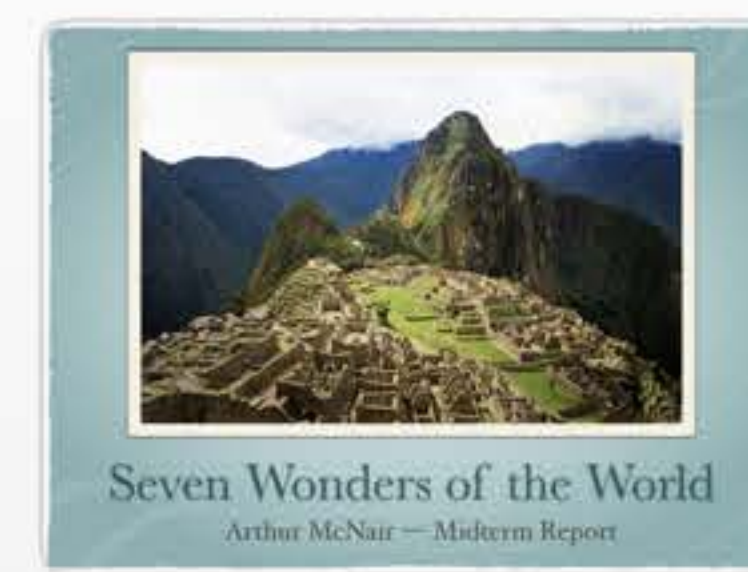
See All



Design Goals
Today at 5:44 PM
iCloud Drive



Hiking Trip
Today at 5:41 PM
iCloud Drive



Seven Wonders
Today at 5:41 PM
iCloud Drive



Crab Nebula
Today at 5:40 PM
iCloud Drive



Anne-Louise
Today at 5:39 PM
iCloud Drive



The Little Inn Hotel
Group
Today at 5:39 PM
iCloud Drive



Smithsonian
Today at 5:38 PM
iCloud Drive



Victoire
Today at 5:38 PM
iCloud Drive

Shared Documents

See All



Recents

Browse

RAN RETINA
7,7 POUCES

Hello

Sed et lacus quis enim mattis nonum



Grid, Slideshow, Share, Add to Library

Albums

- All Photos 34
- Videos 18
- Screenshots 7

Insert from... Take Photo or Video Image Gallery

Hello

Sed et lacus quis enim mattis nonum



Albums

- All Photos 34
- Videos 18
- Screenshots 7

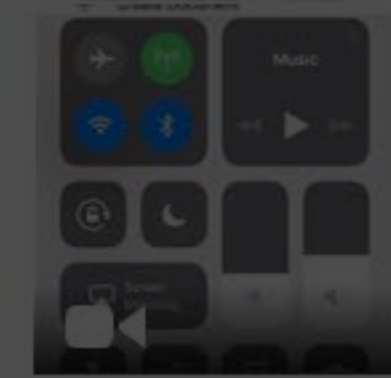
Insert from... Take Photo or Video Image Gallery

Hello

Sed et lacus quis enim mattis nonun



Albums



All Photos
34



Videos
18



Screenshots
7



Insert from...



Take Photo
or Video



Image
Gallery

9:41 Mon Jun 4

100%

Documents

Dissertation

Recents

Cancel

Search

See All



Crab Nebula
5:40 PM



Anne-Louise
5:39 PM



Smithsonian
5:38 PM



Victoire
5:38 PM



Gazeran
5:37 PM



Space
5:31 PM

Blue

See All



Recents



Browse



Albums

All Photos
34

Videos
18

Screenshots
7



Take Photo
or Video

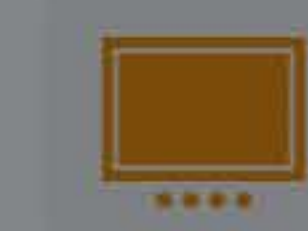
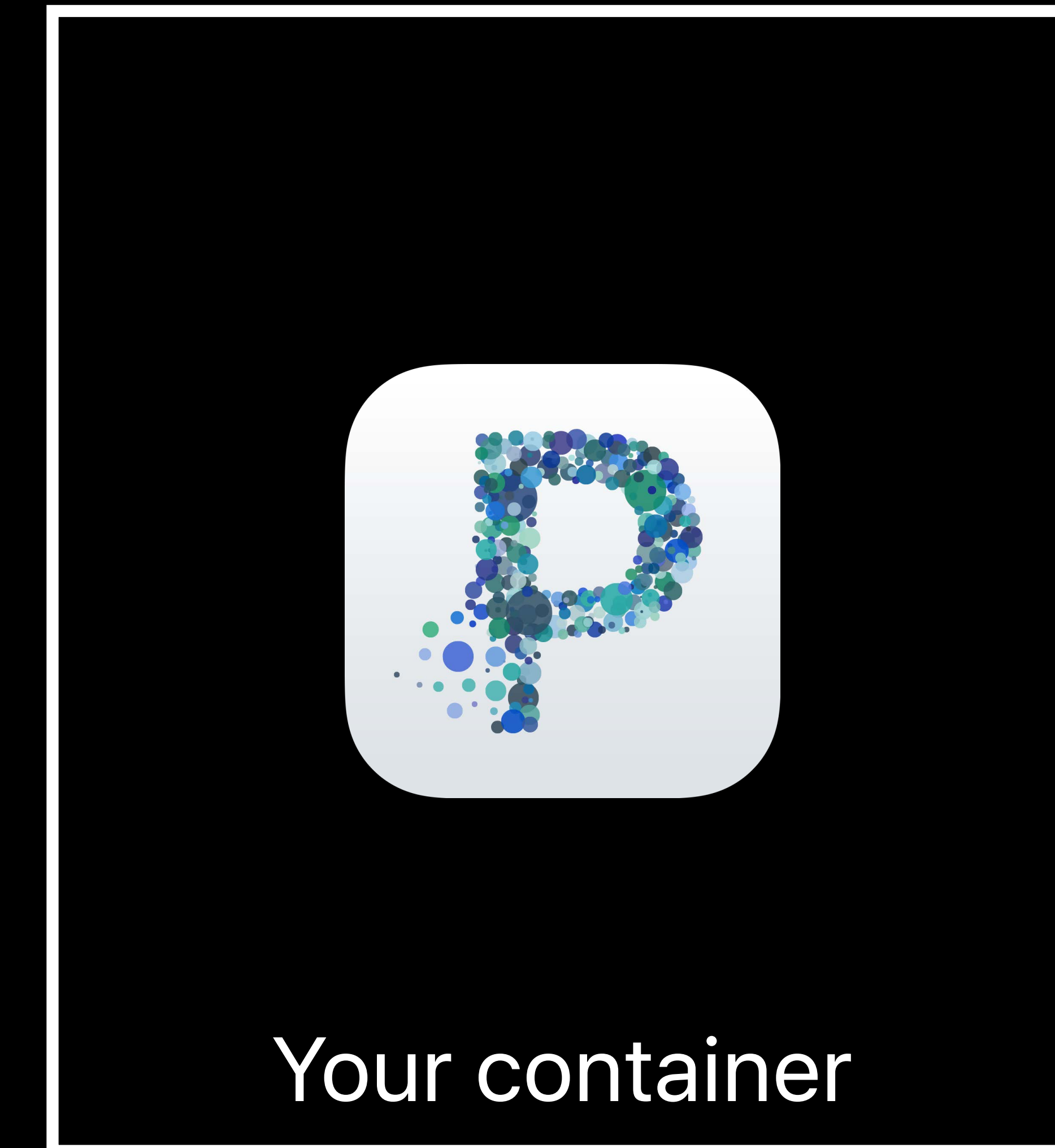


Image
Gallery

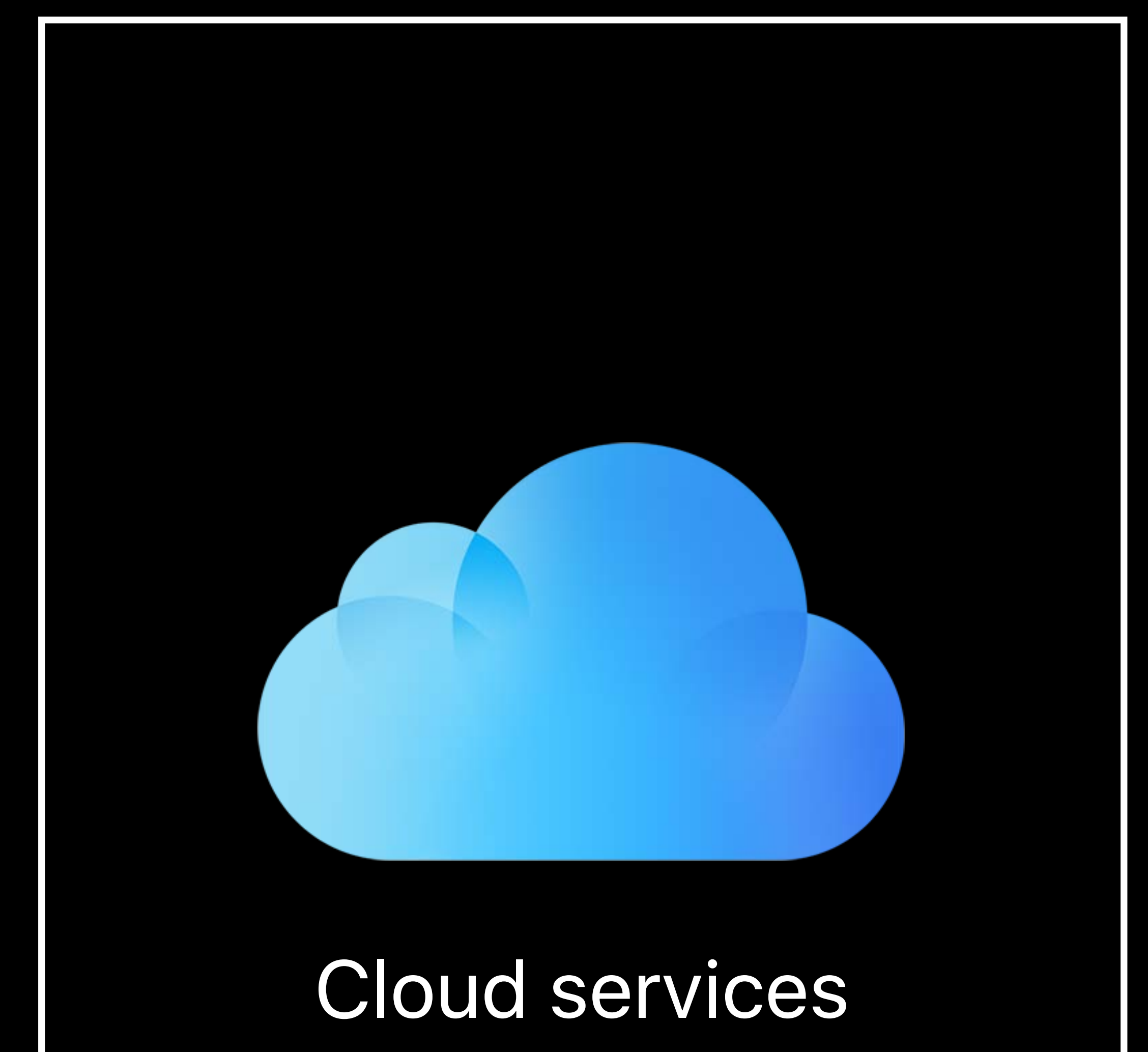
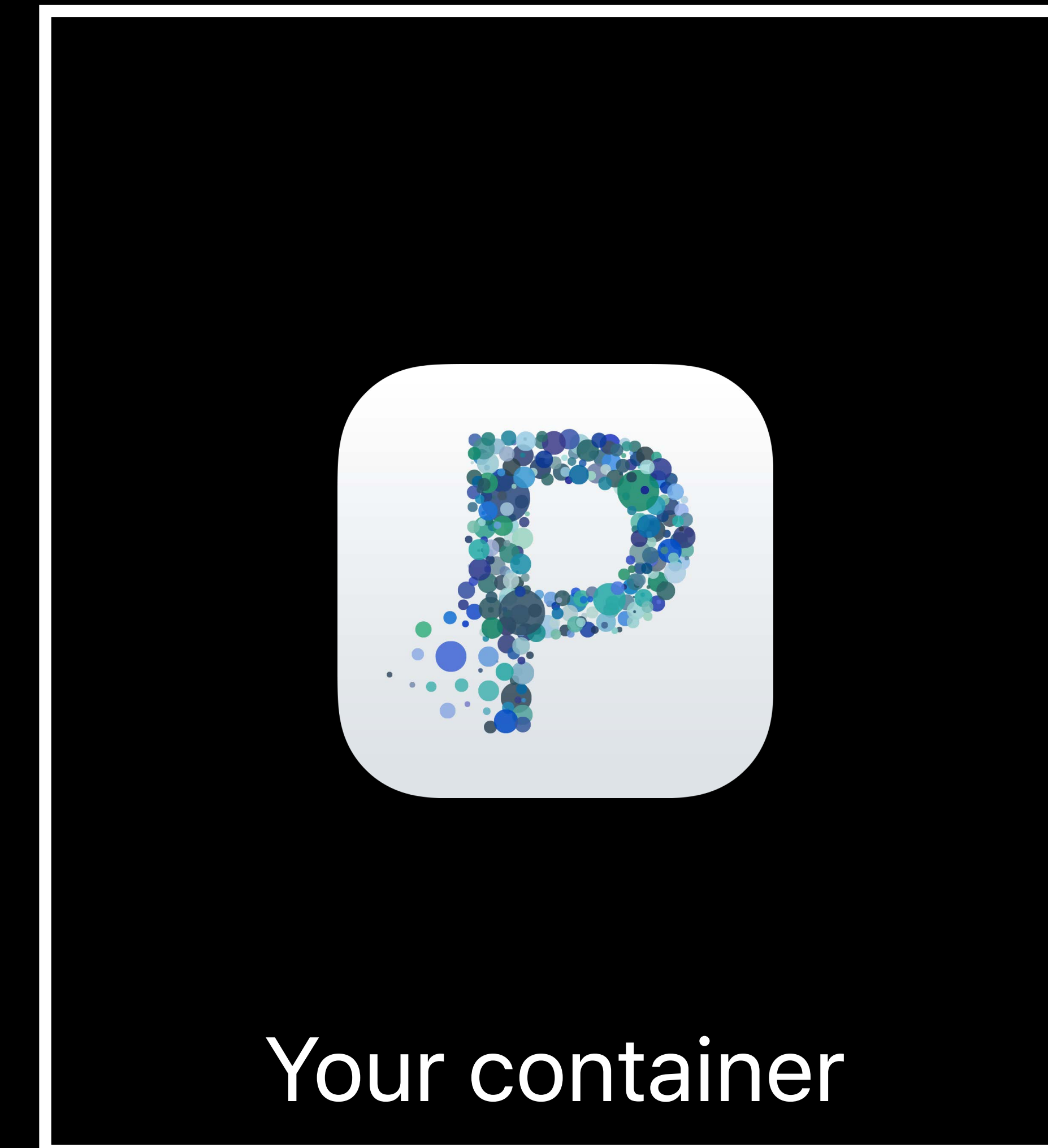
UIDocumentPickerViewController

Documents might be in multiple locations



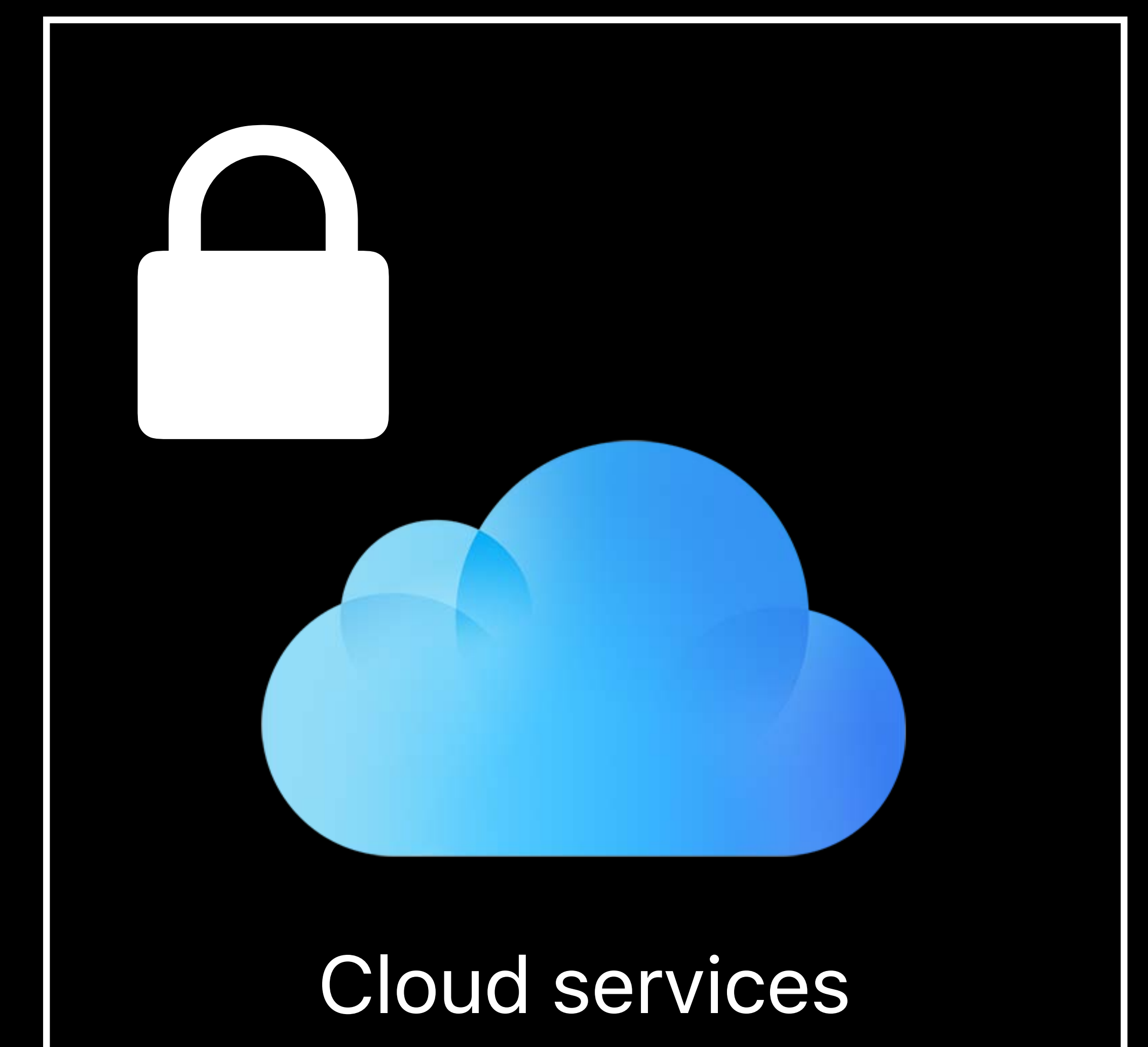
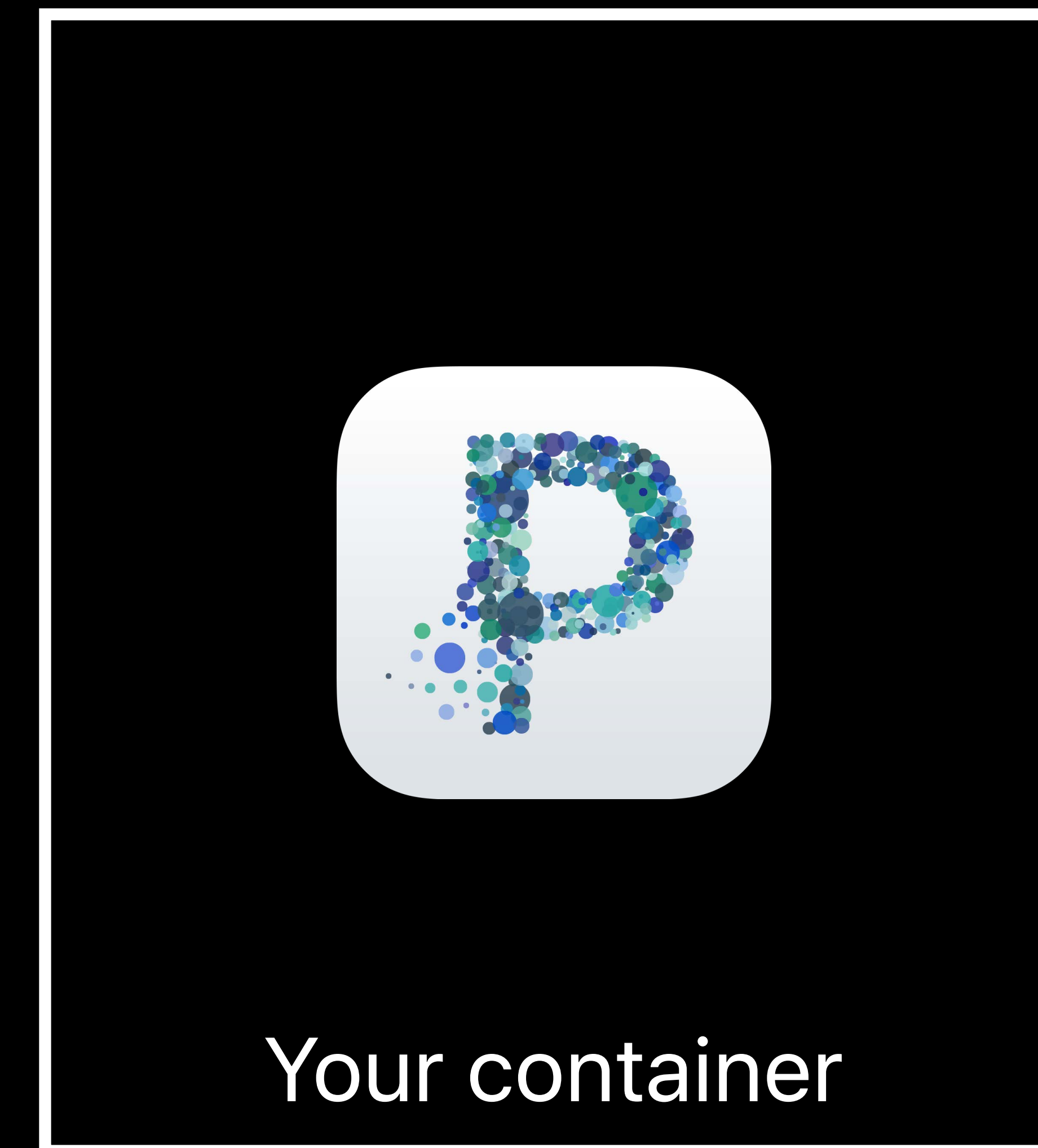
UIDocumentPickerViewController

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UIDocumentPickerViewController

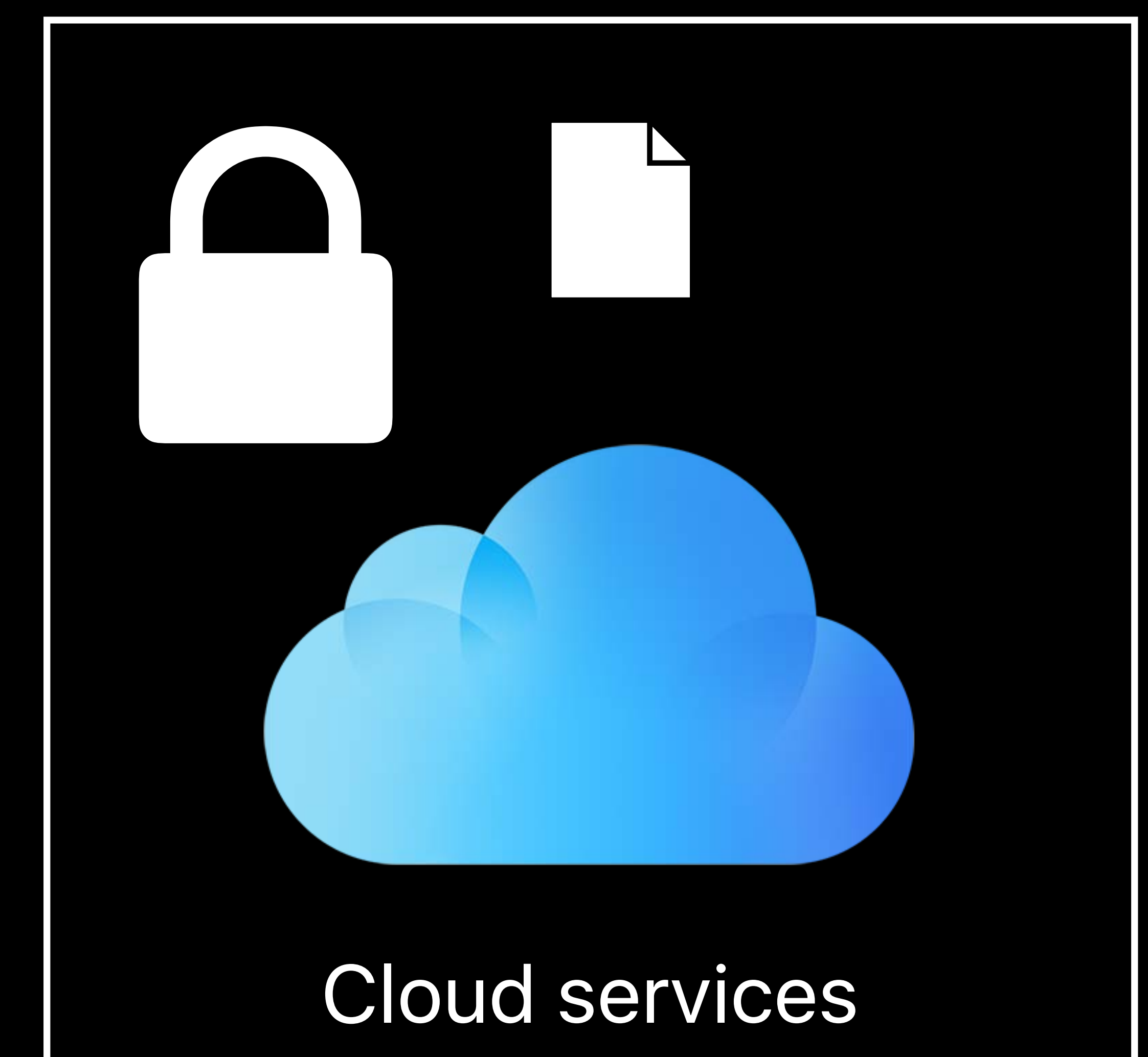
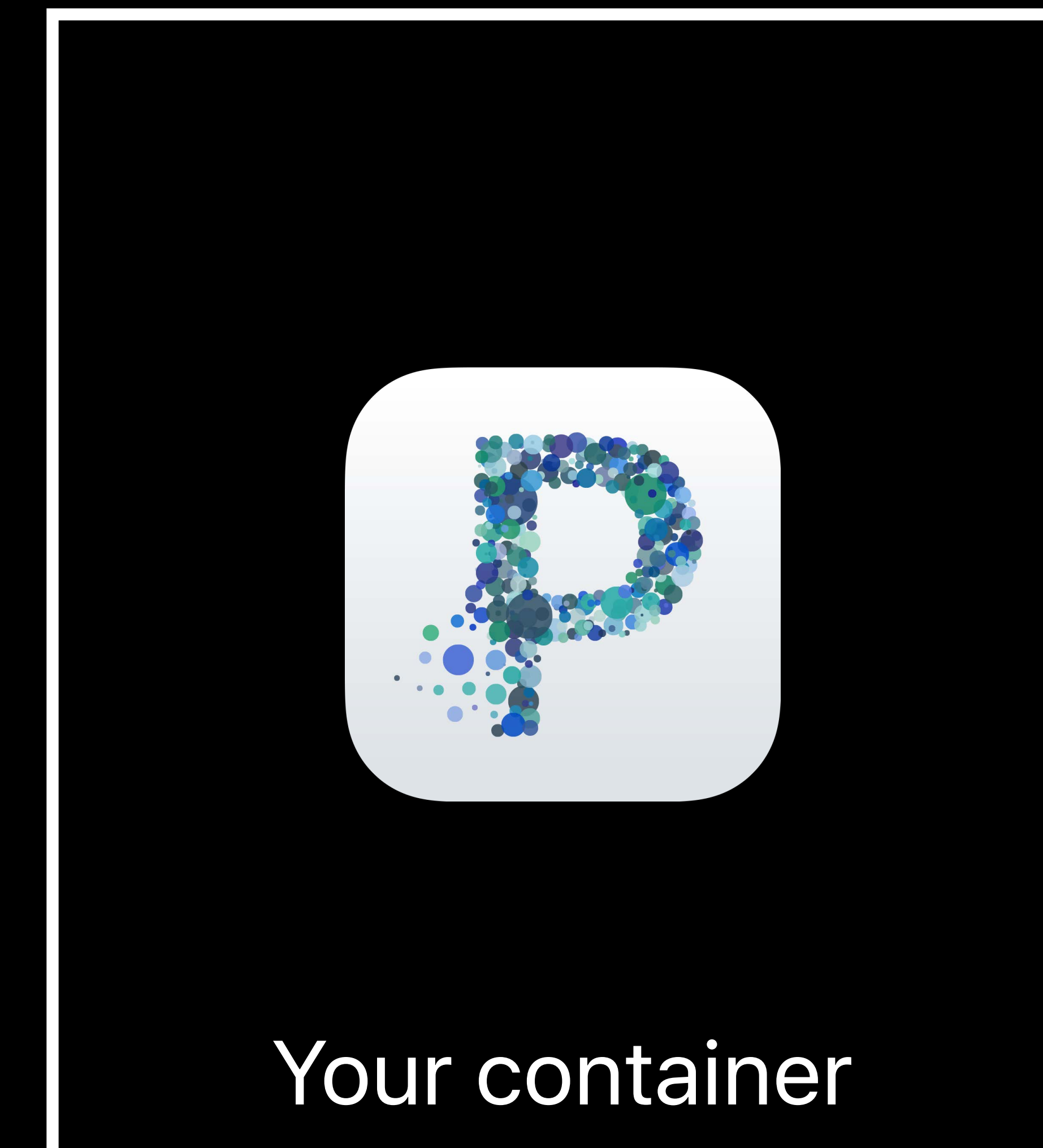
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UIDocumentPickerViewController

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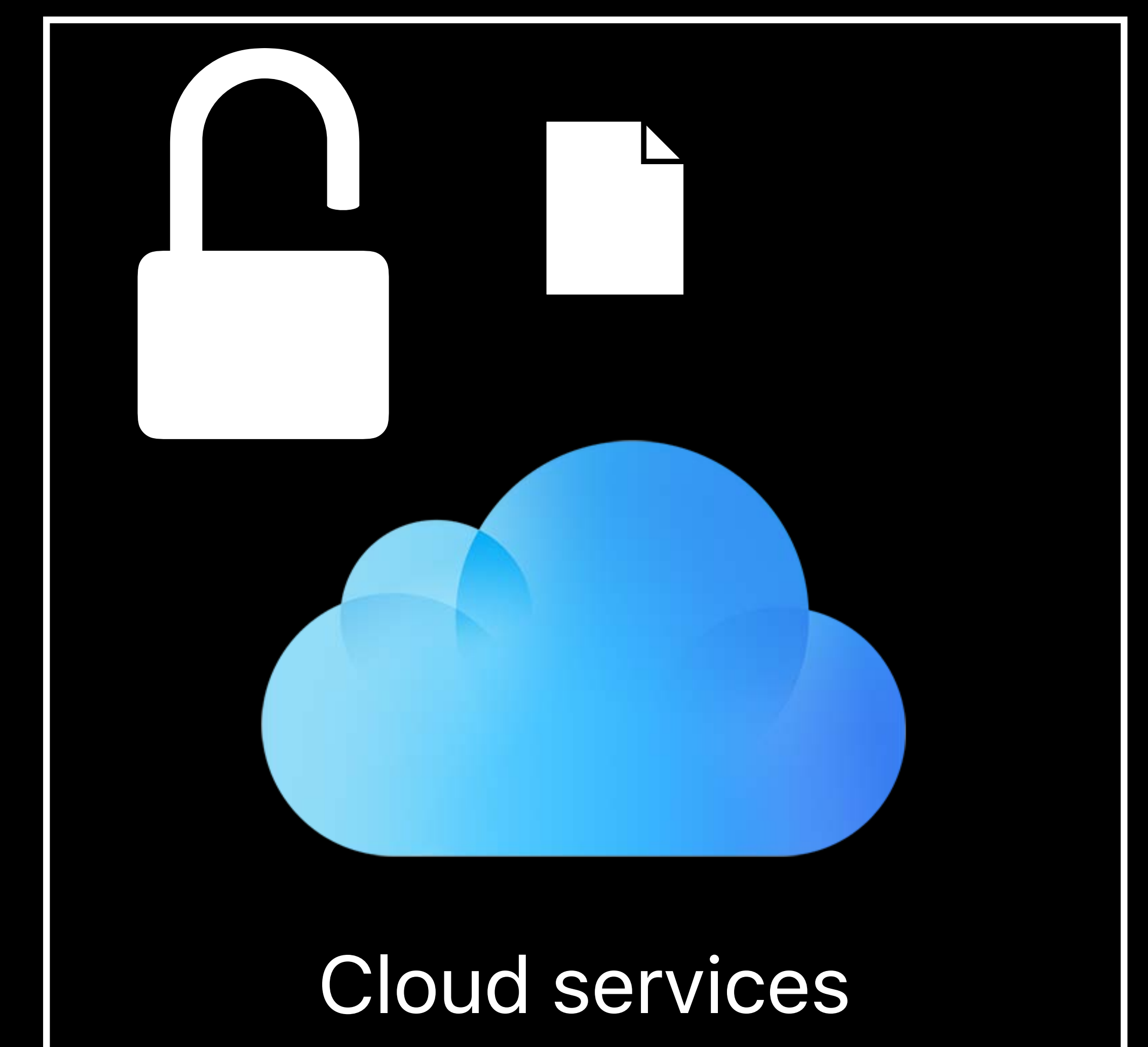
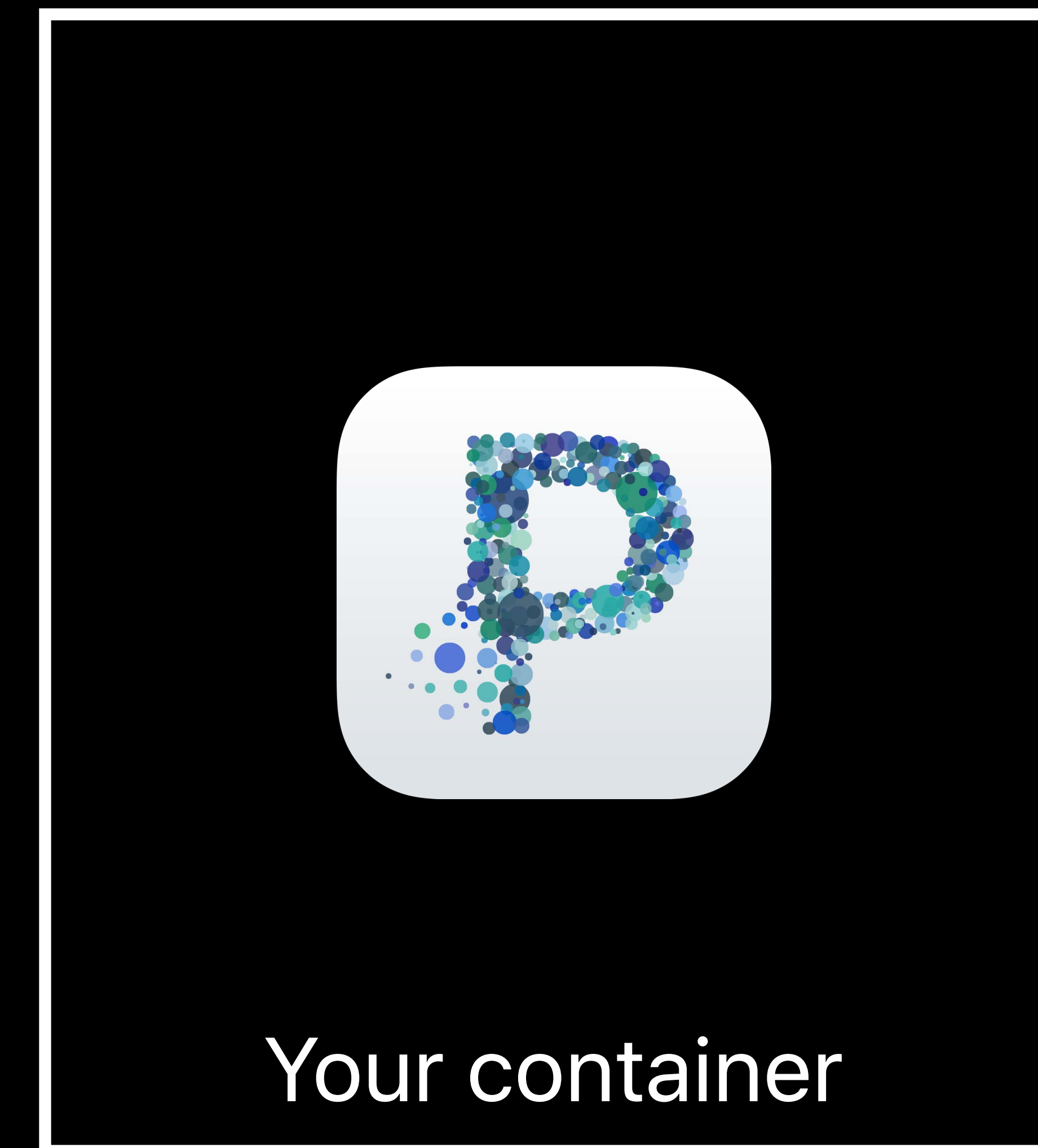
Access / copy / move documents



UIDocumentPickerViewController

Documents might be in multiple locations

Access / copy / move documents

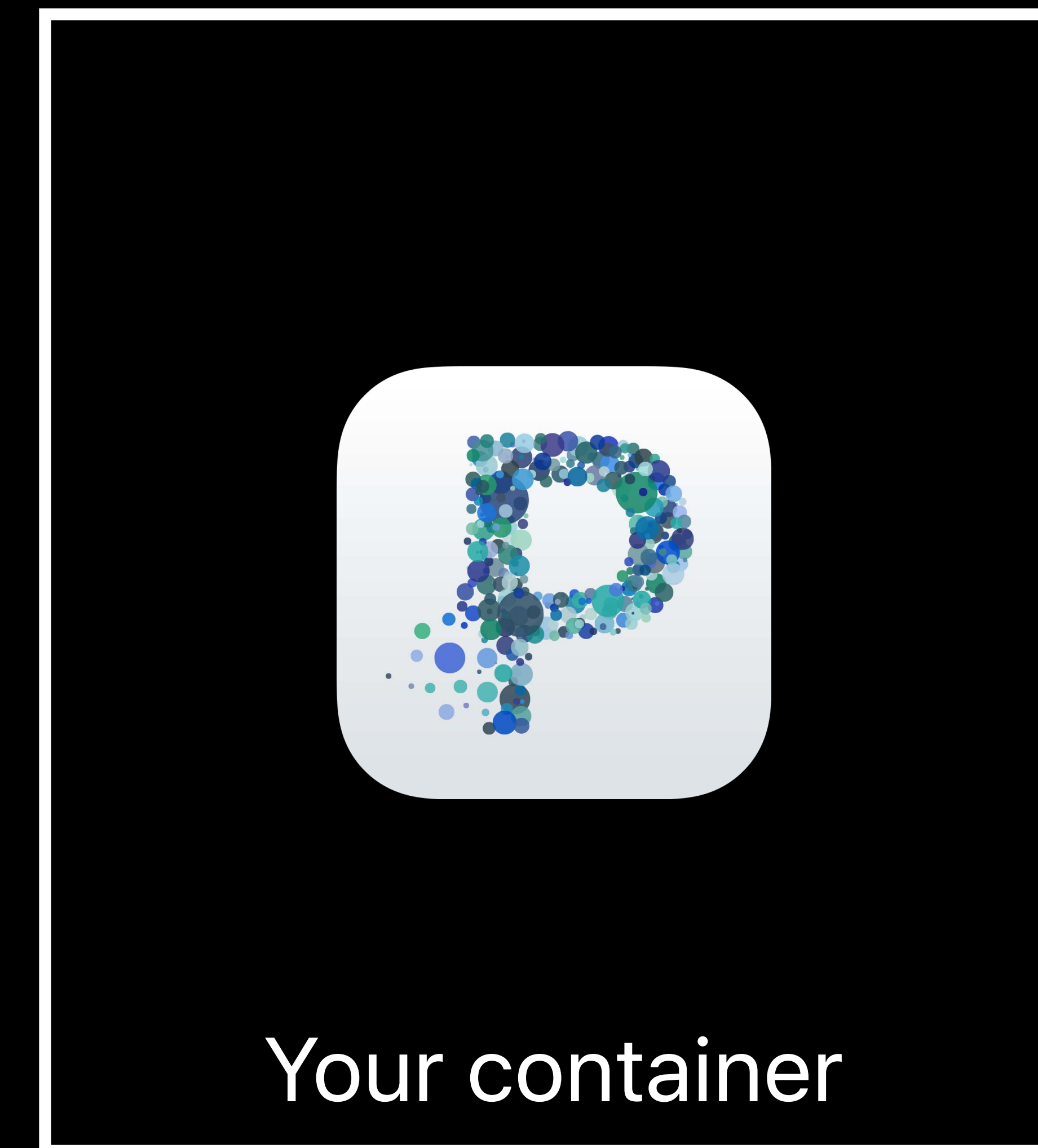


UIDocumentPickerViewController

Documents might be in multiple locations

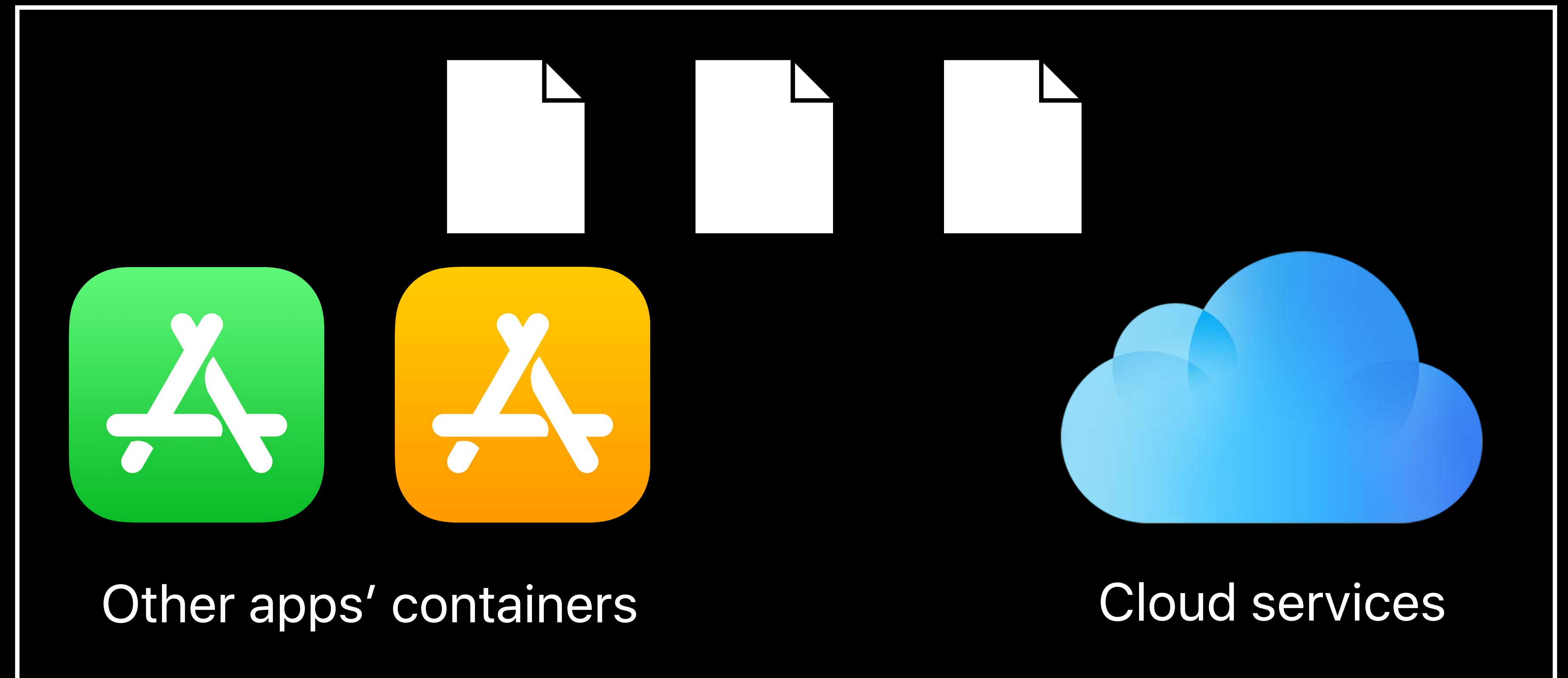
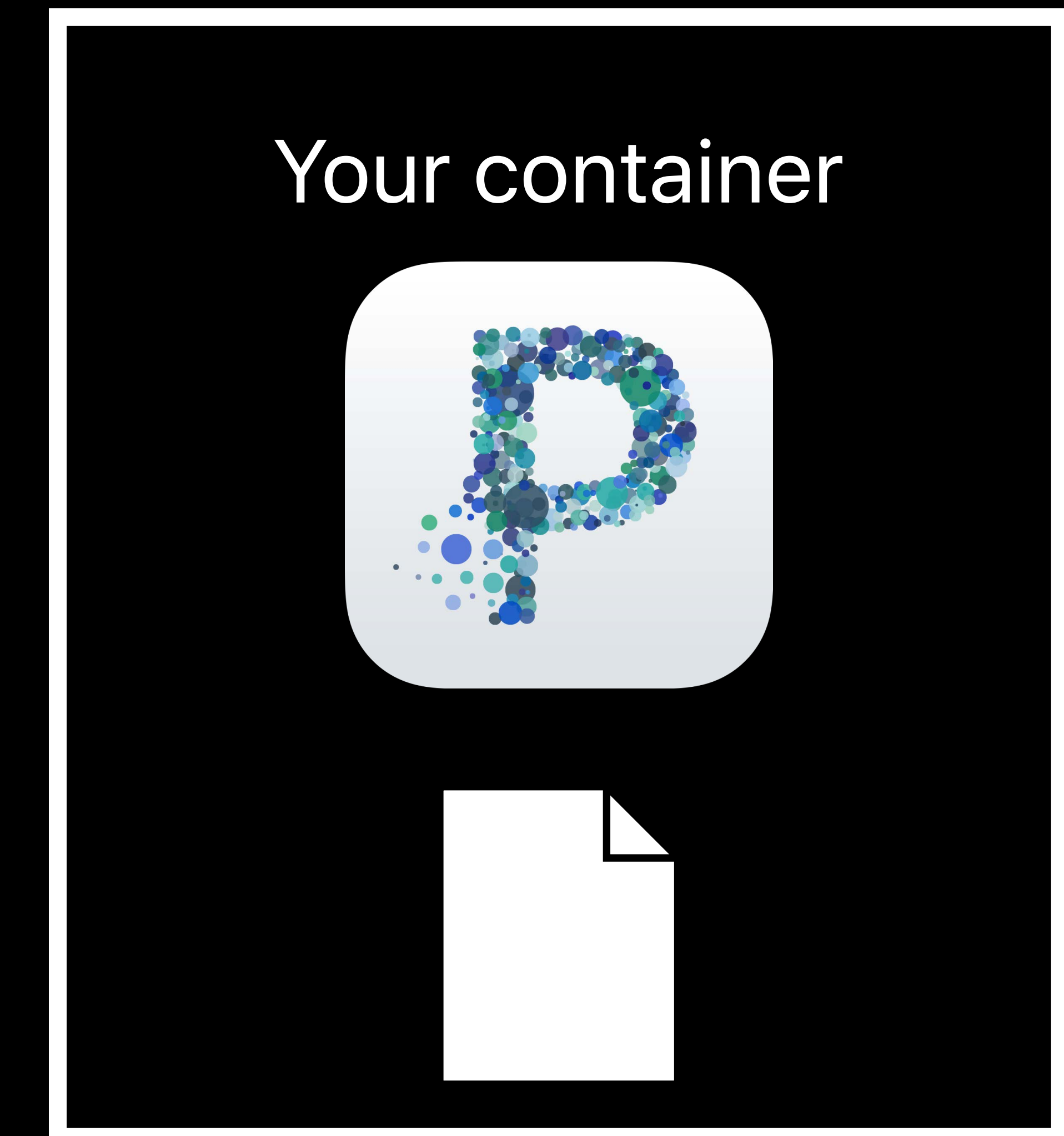
Access / copy / move documents

Quick user action



UIDocumentPickerViewController

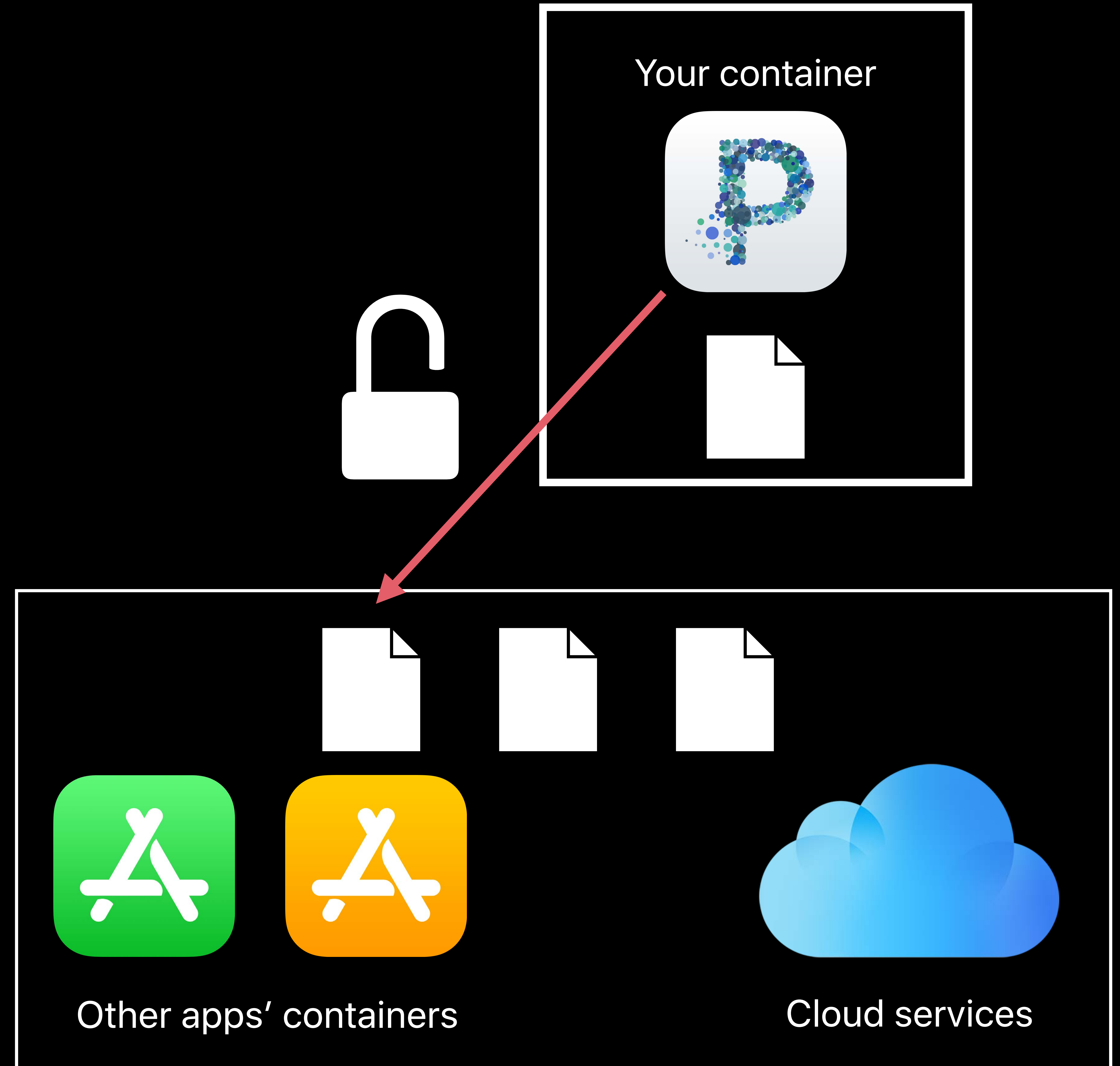
Use a document picker to



UIDocumentPickerViewController

Use a document picker to

Access files in the cloud
(.open)

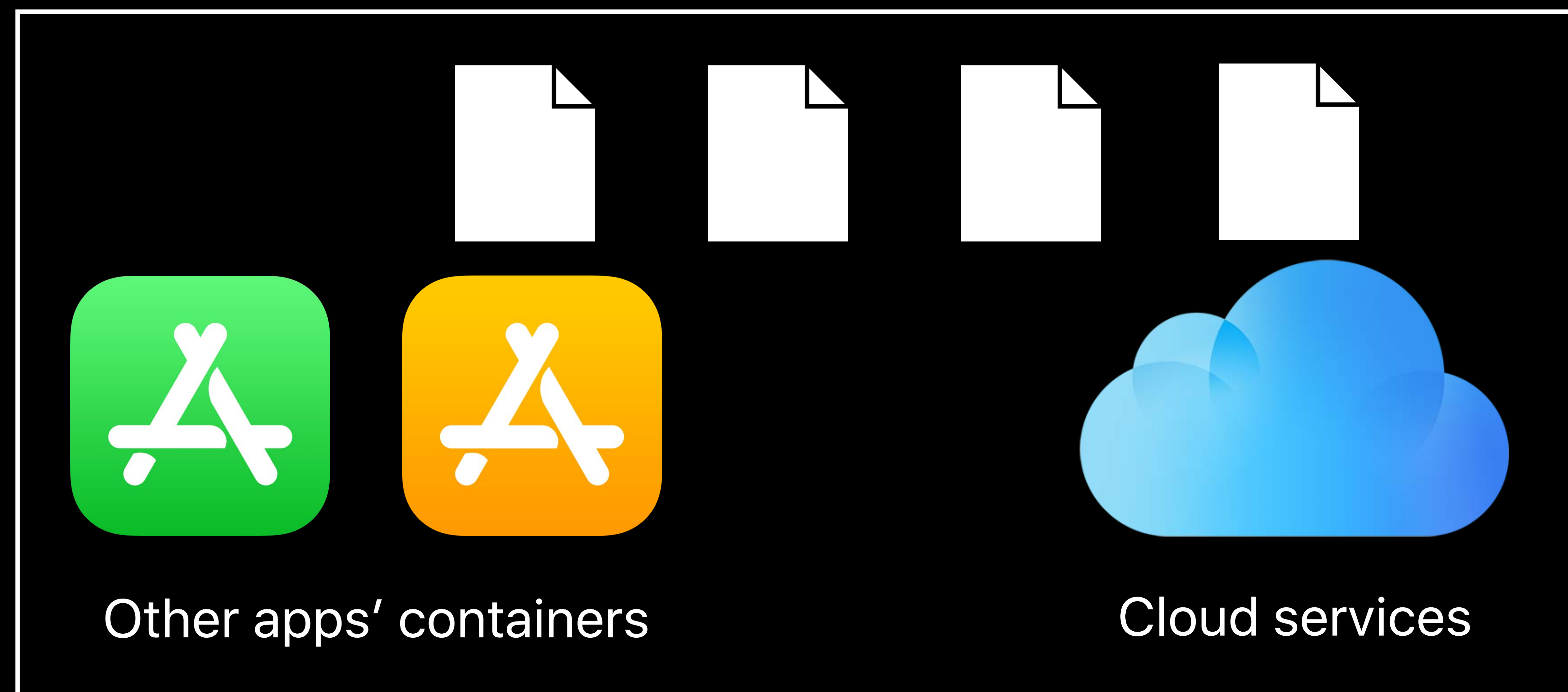
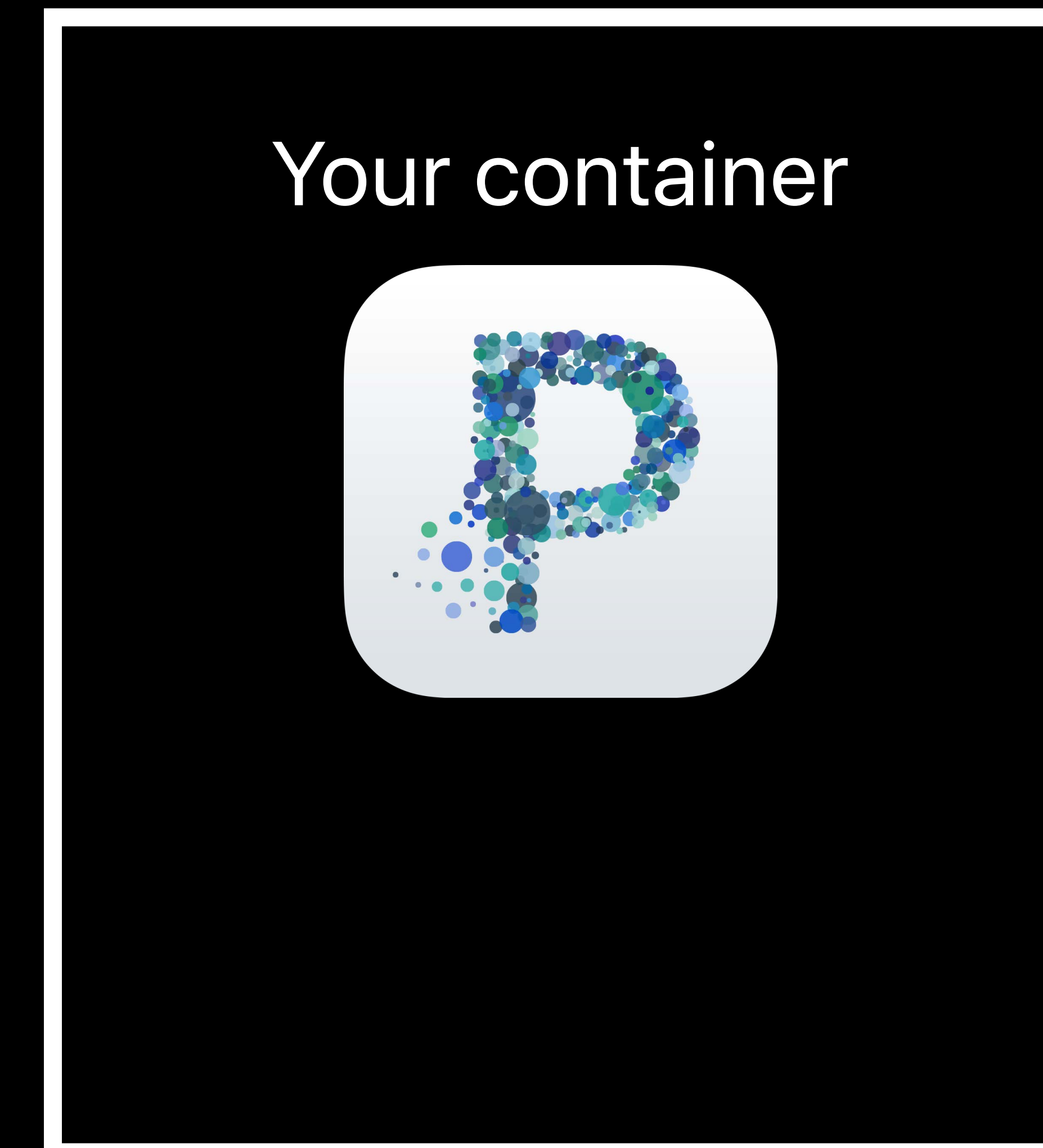


UIDocumentPickerViewController

Use a document picker to

Access files in the cloud
(.open)

Move files to the cloud
(.moveToService)



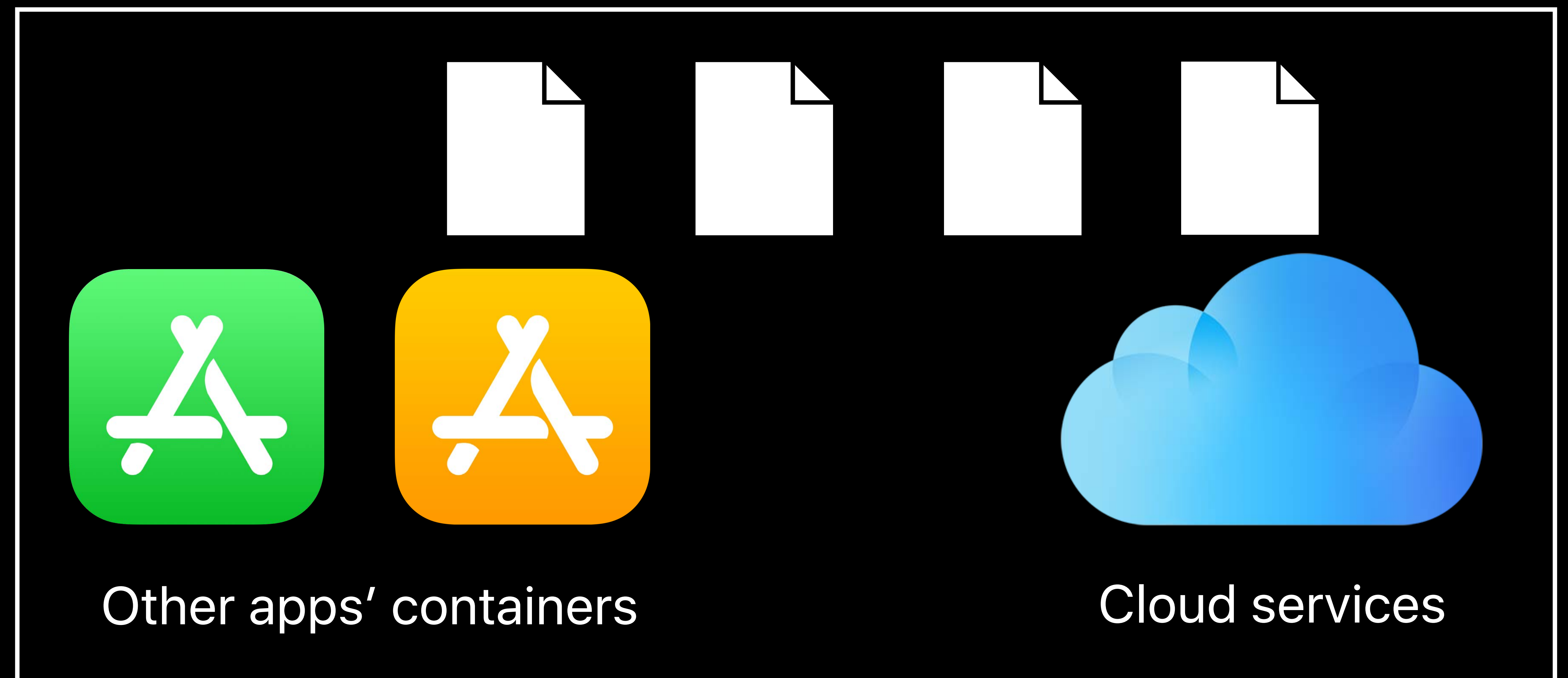
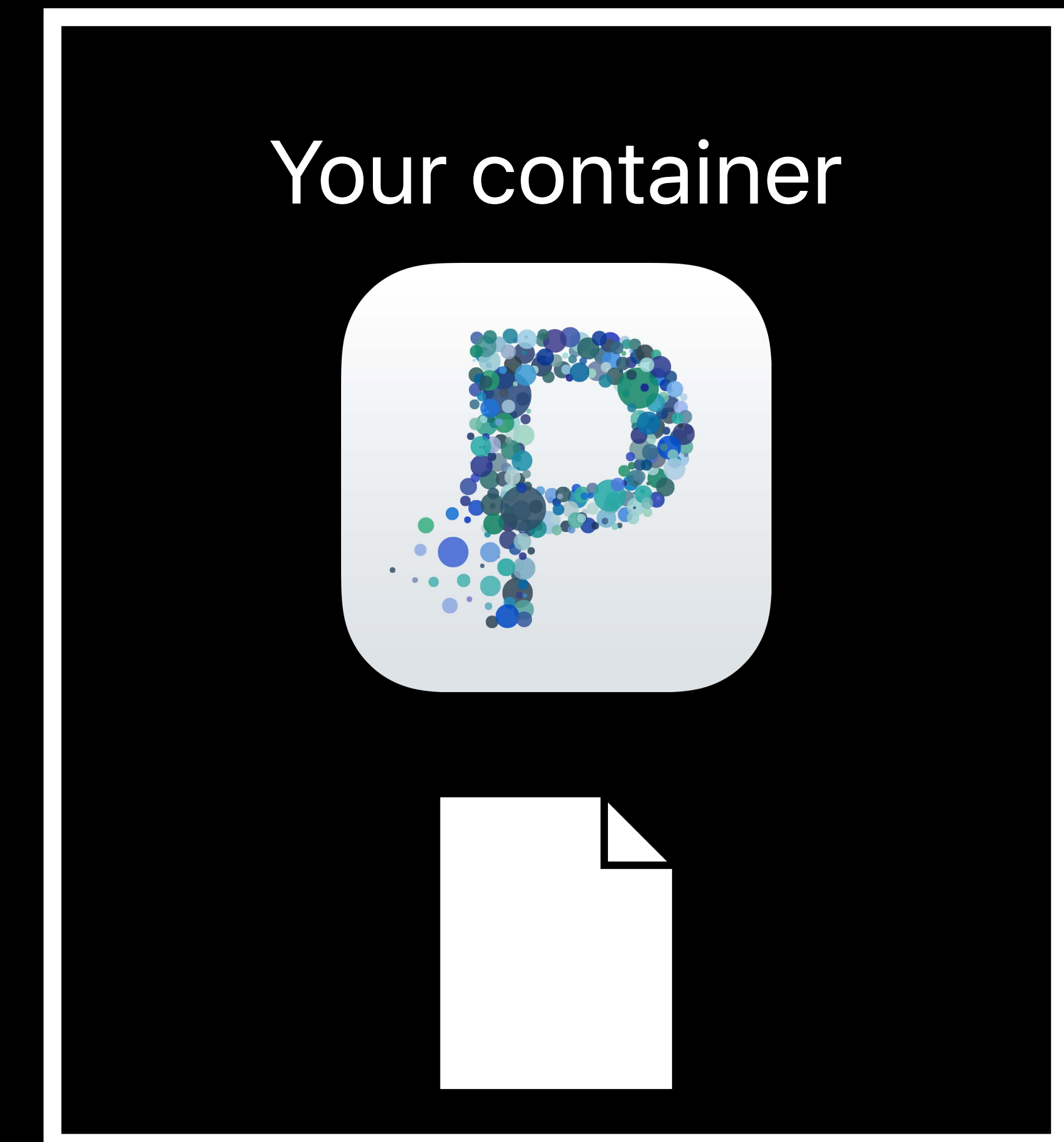
UIDocumentPickerViewController

Use a document picker to

Access files in the cloud
(.open)

Move files to the cloud
(.moveToService)

Copy from/to the cloud
(.import,
.exportToService)



Example—Access a Video from the Cloud

Create a UIDocumentPickerViewController and present it

```
let picker = UIDocumentPickerViewController(documentTypes: [kUTTypeVideo as String],
                                             in: .open)

picker.delegate = self
self.present(picker, animated: true)
```

Get the selected file URL

```
override func documentPicker(_ controller: UIDocumentPickerViewController,
                             didPickDocumentsAt urls: [URL]) {
    // use the retrieved URLs
}
```

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Demo

Document Types

Document Types let the system know which files your application handles

Document Types

Document Types

Important! They let iOS—

Document Types

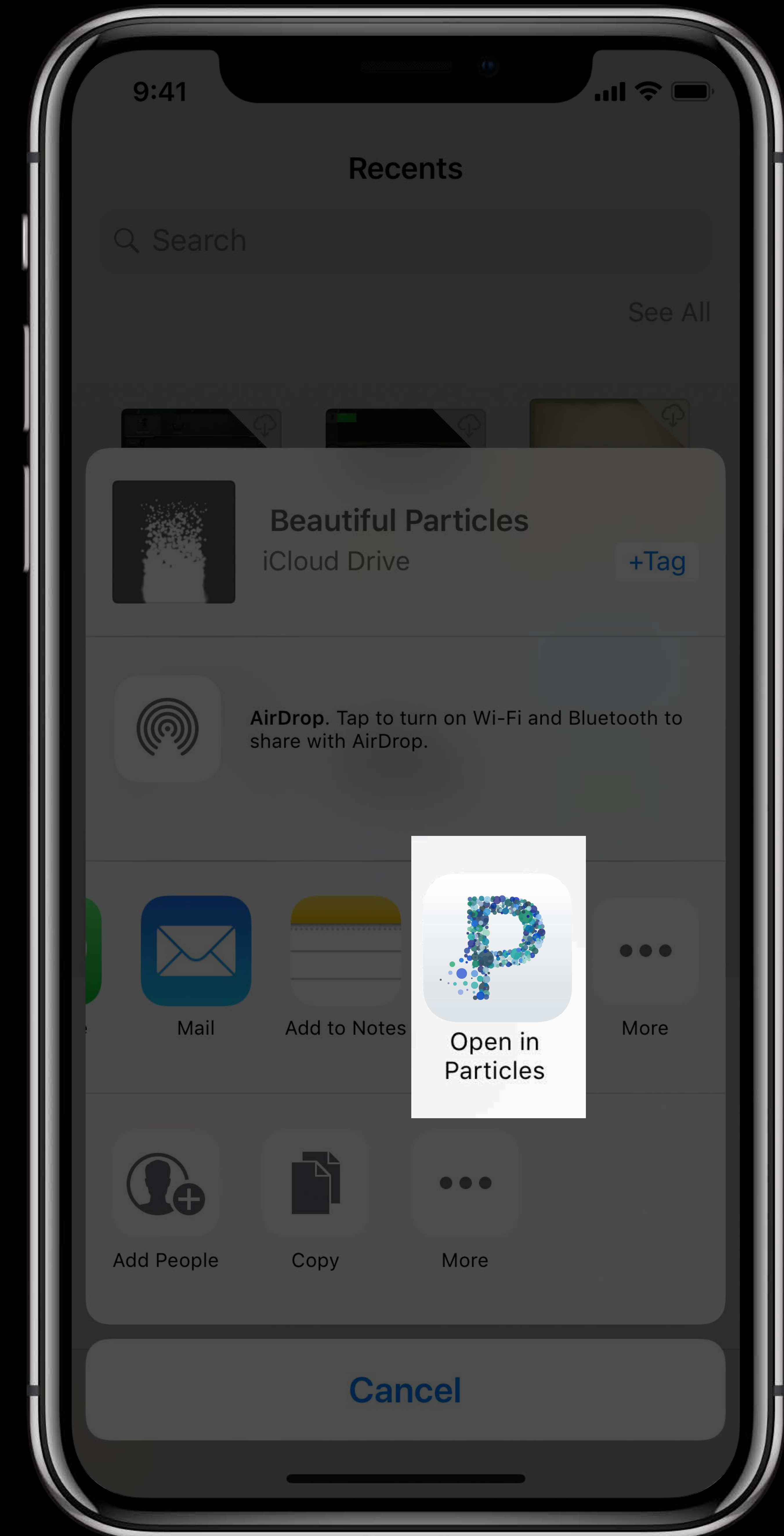
Important! They let iOS—

- open your app when a file is tapped in the Files app

Document Types

Important! They let iOS—

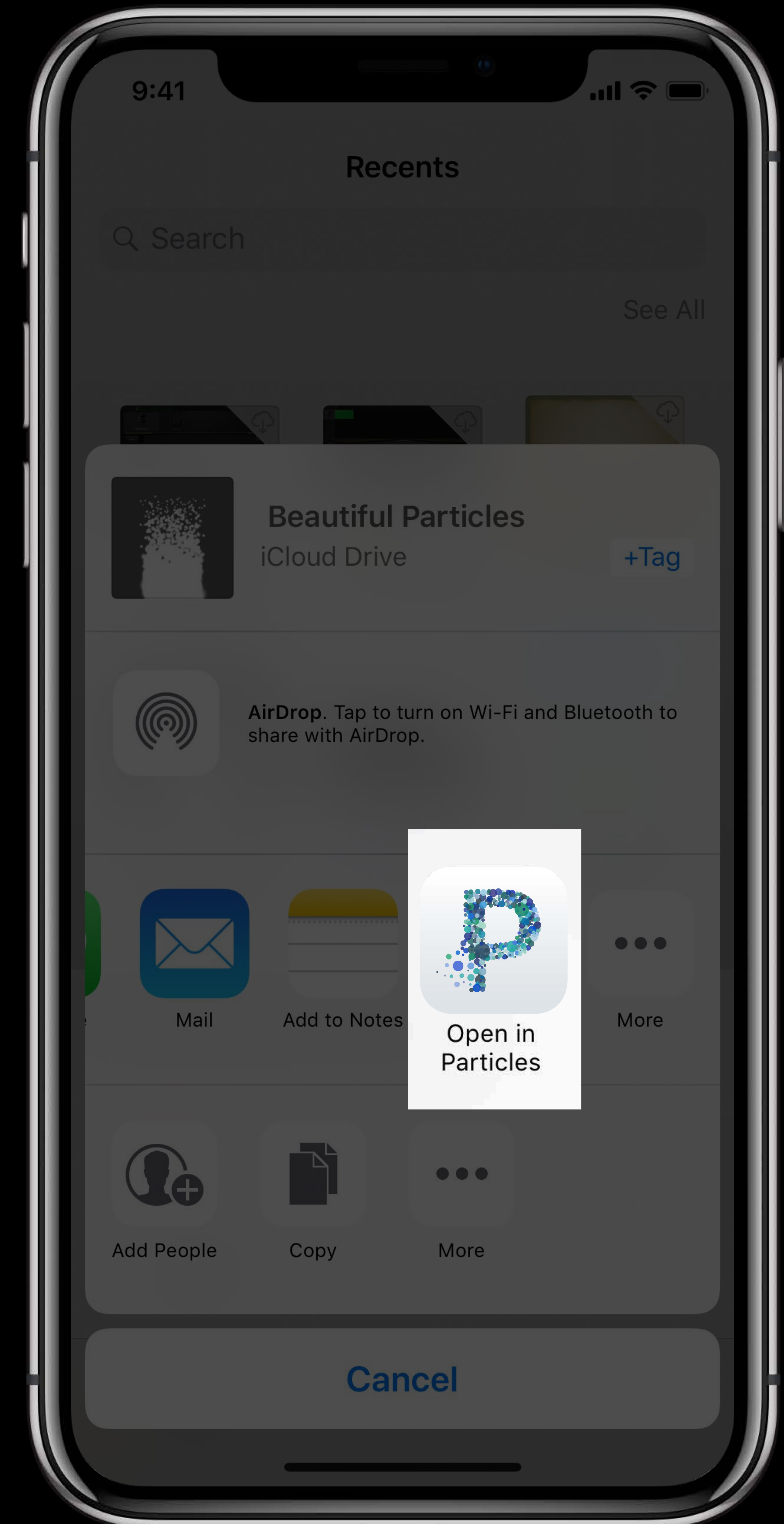
- open your app when a file is tapped in the Files app
- show your app in the Share Sheet



Document Types

Important! They let iOS—

- open your app when a file is tapped in the Files app
- show your app in the Share Sheet
- use the proper icon for your documents



< iCloud Drive

Particles

Select

Q Search



Beautiful
Particles

14:46
5 KB

🕒 Recents

📁 Browse

< iCloud Drive

Particles

Select

Q Search



Beautiful
Particles

14:46
5 KB

Recents

Browse

Document Types

Two steps—

- *Declaring* the type if it is not already declared by iOS
- *Claiming* that you can view or edit files of this type

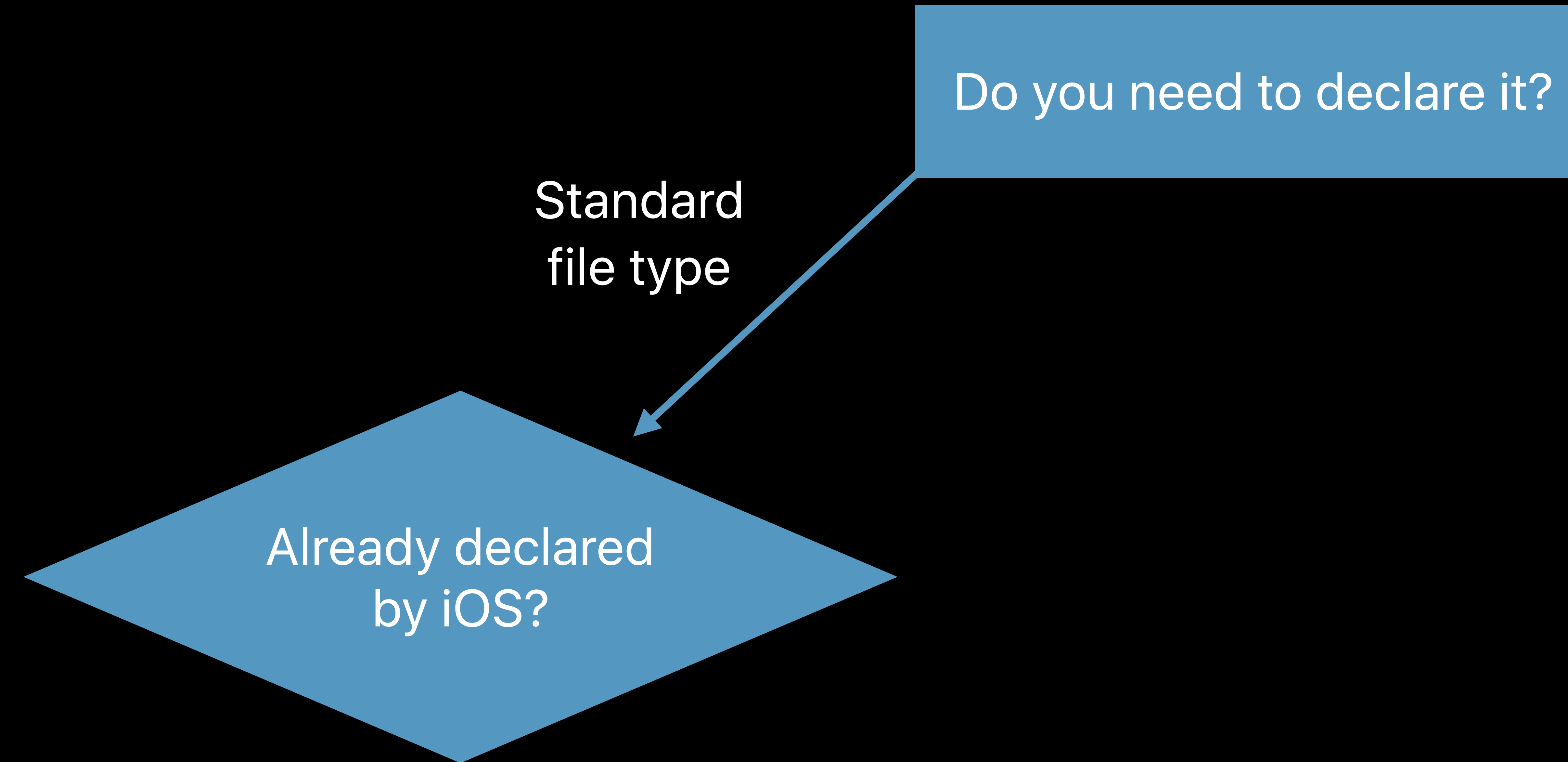
Declaring a Type

Do you need to declare it?

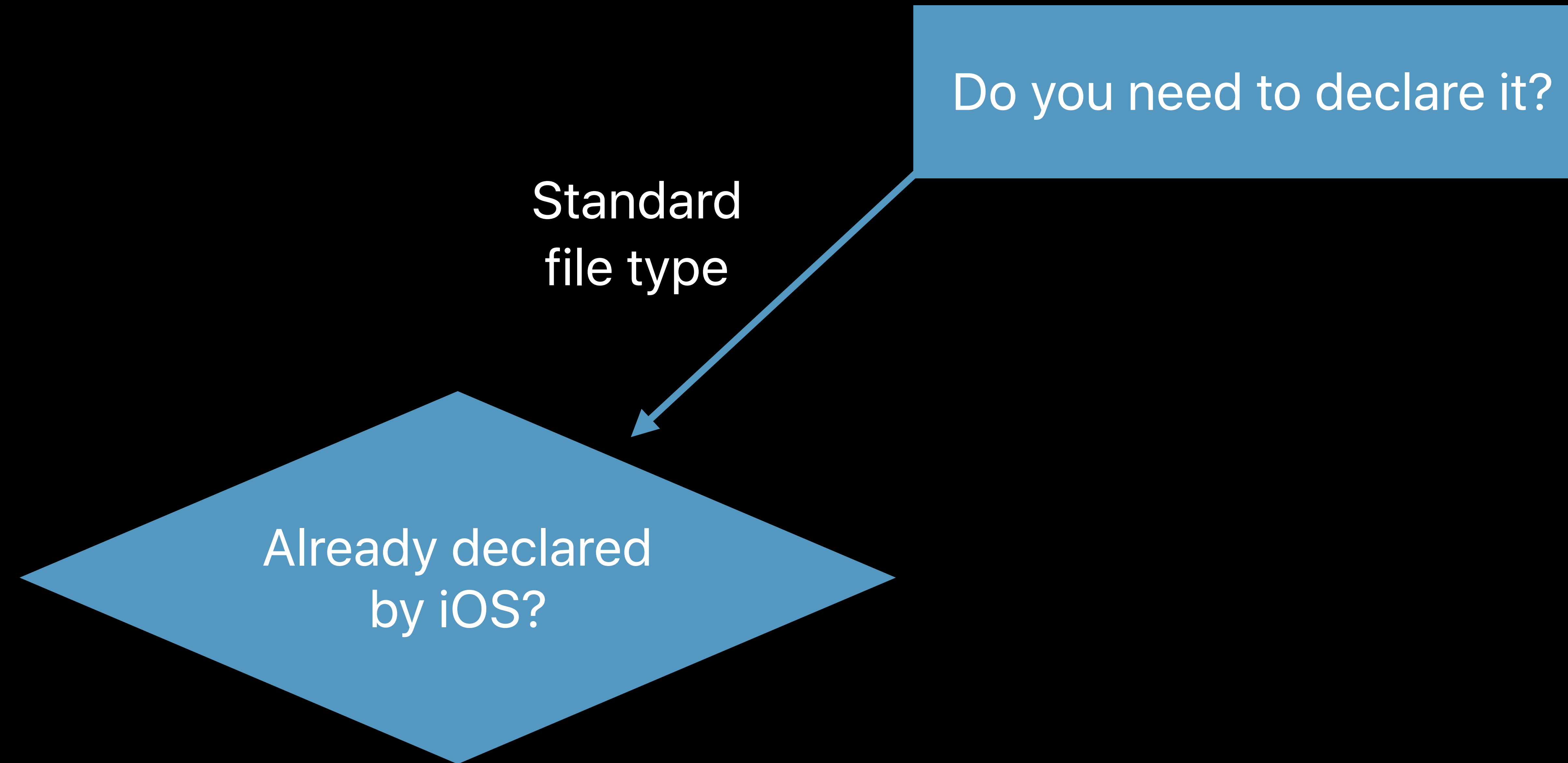
Declaring a Type



Declaring a Type

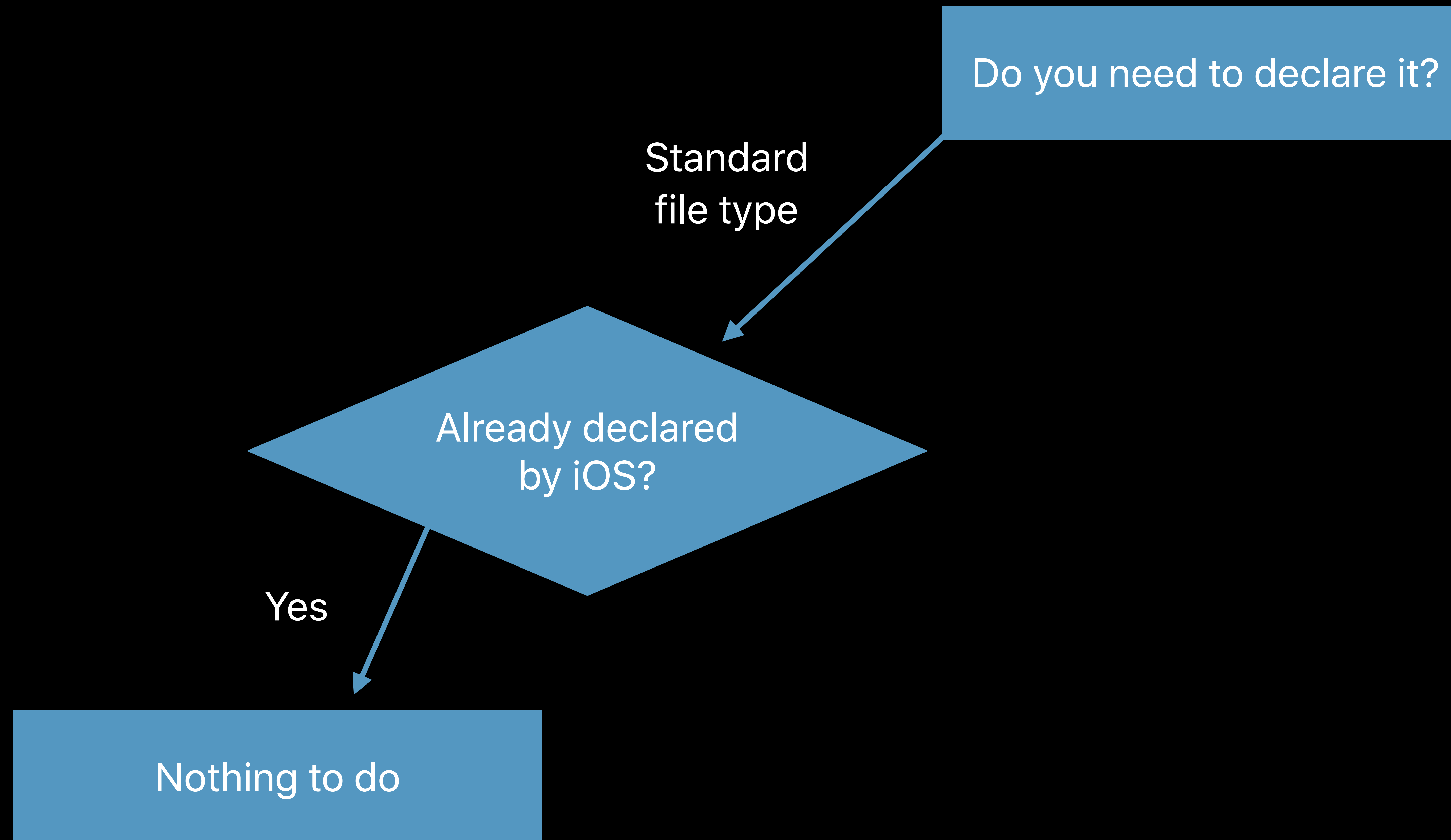


Declaring a Type



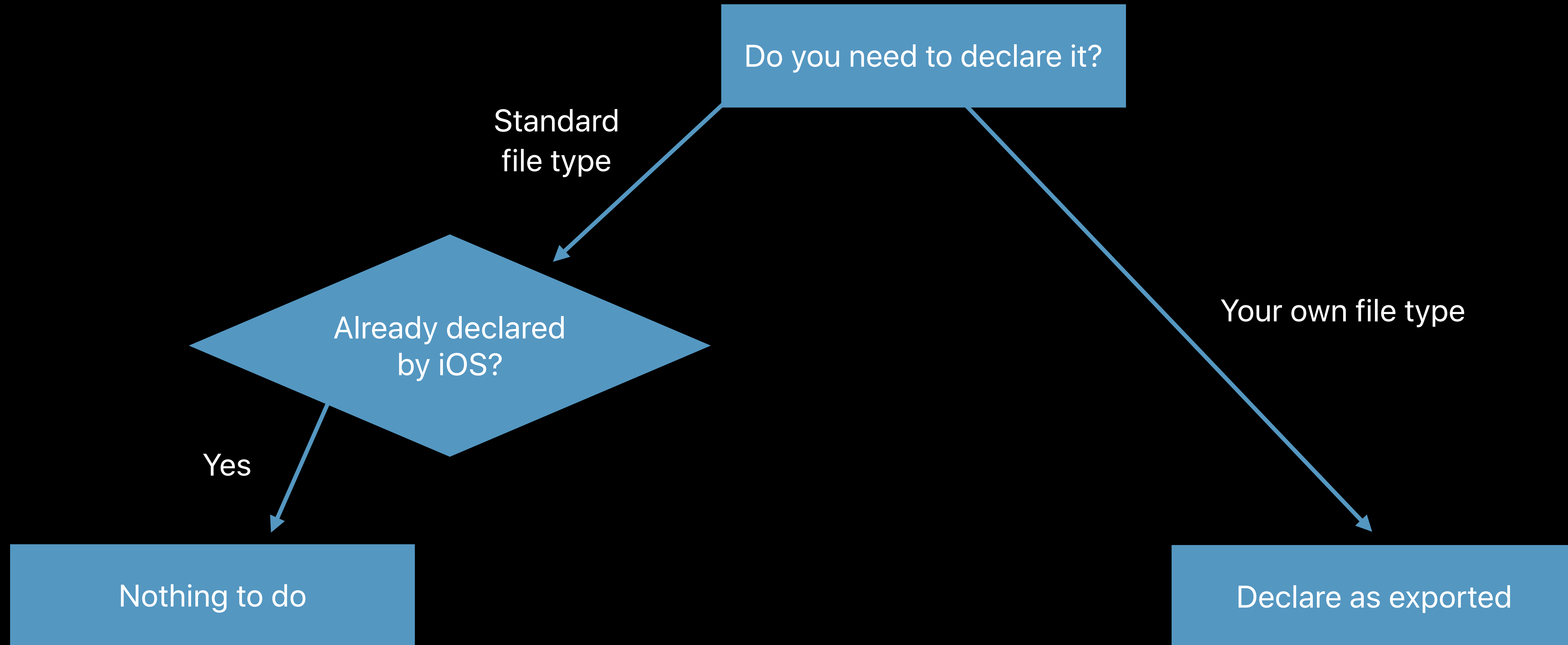
<https://developer.apple.com/library/content/documentation/Miscellaneous/Reference/UTIRef/Articles/System-DeclaredUniformTypeIdentifiers.html>

Declaring a Type



<https://developer.apple.com/library/content/documentation/Miscellaneous/Reference/UTIRef/Articles/System-DeclaredUniformTypeIdentifiers.html>

Declaring a Type

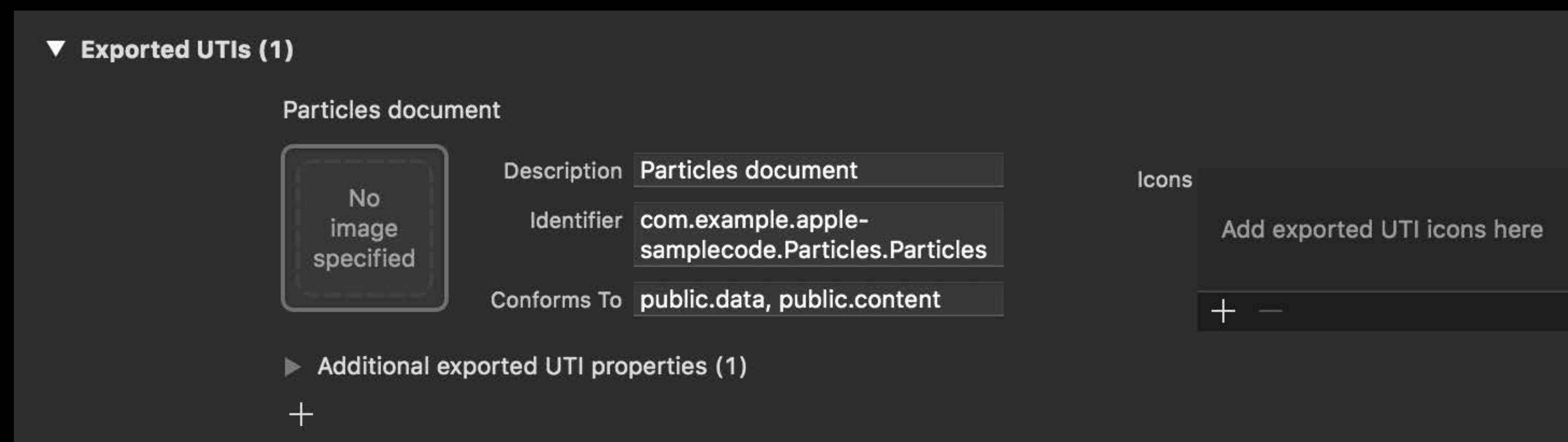


<https://developer.apple.com/library/content/documentation/Miscellaneous/Reference/UTIRef/Articles/System-DeclaredUniformTypeIdentifiers.html>

Declaring a New File Type

Info.plist

Use the Xcode UI

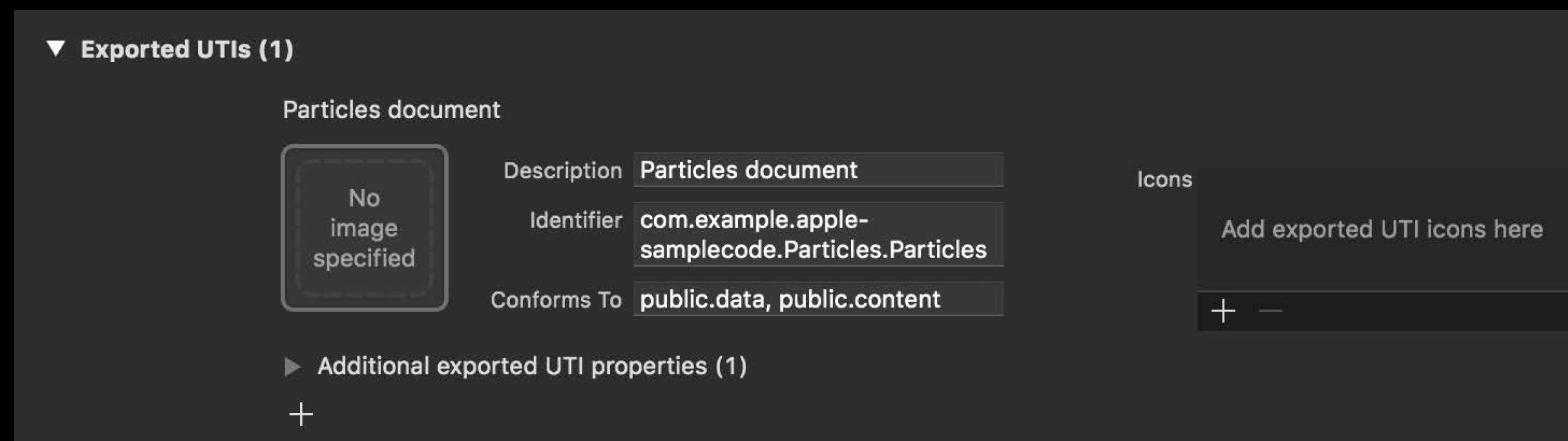


Declaring a New File Type

A type definition is—

An identifier

(`UTTypeIdentifier`)

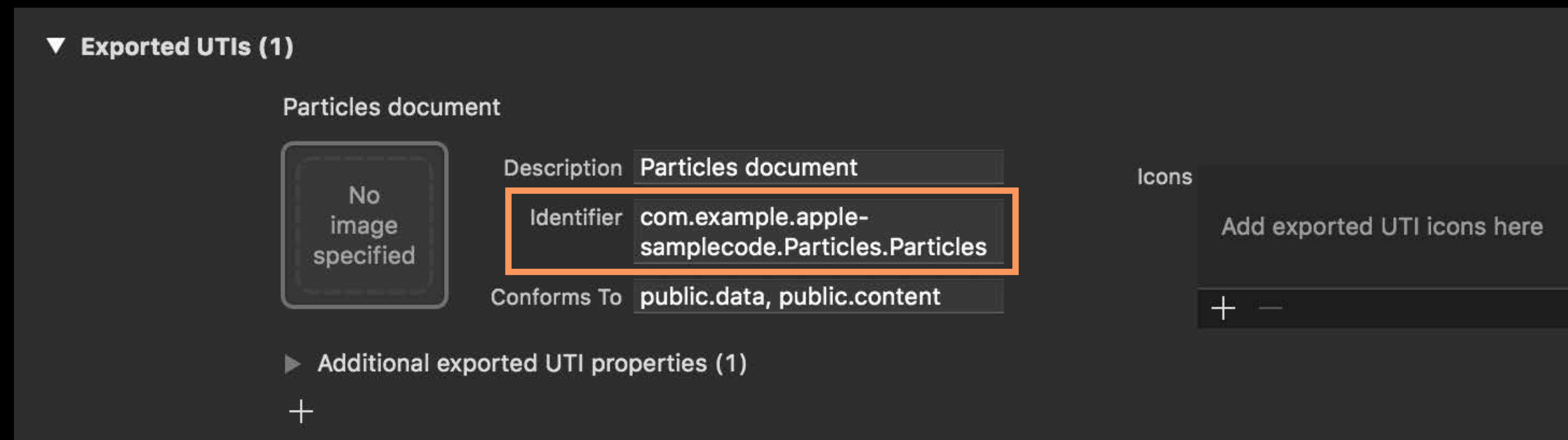


Declaring a New File Type

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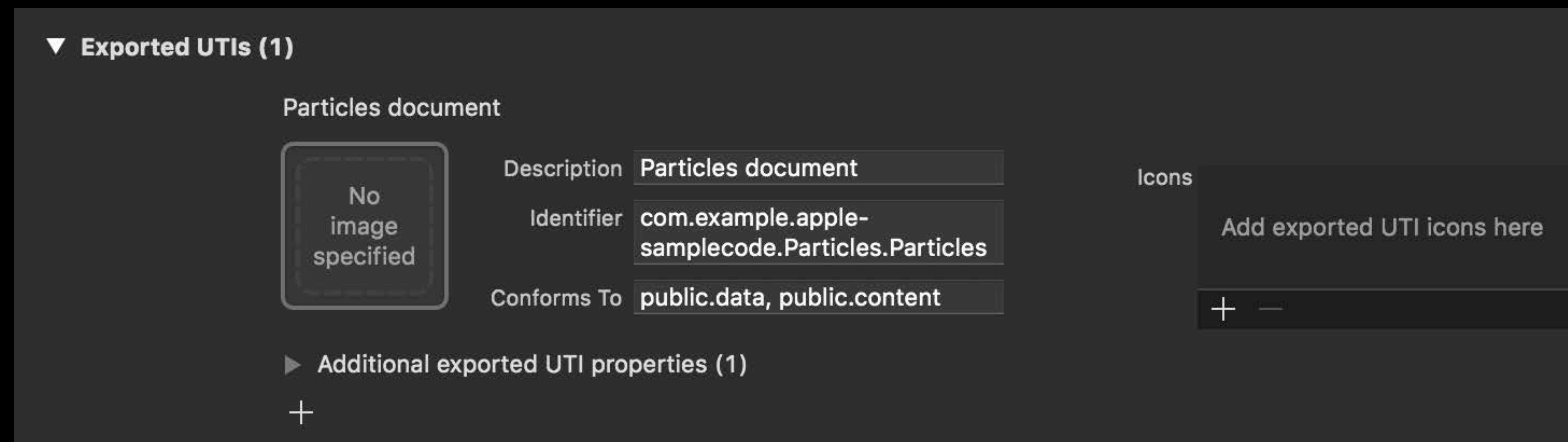
(`UTTypeIdentifier`)



Declaring a New File Type

A type definition is—

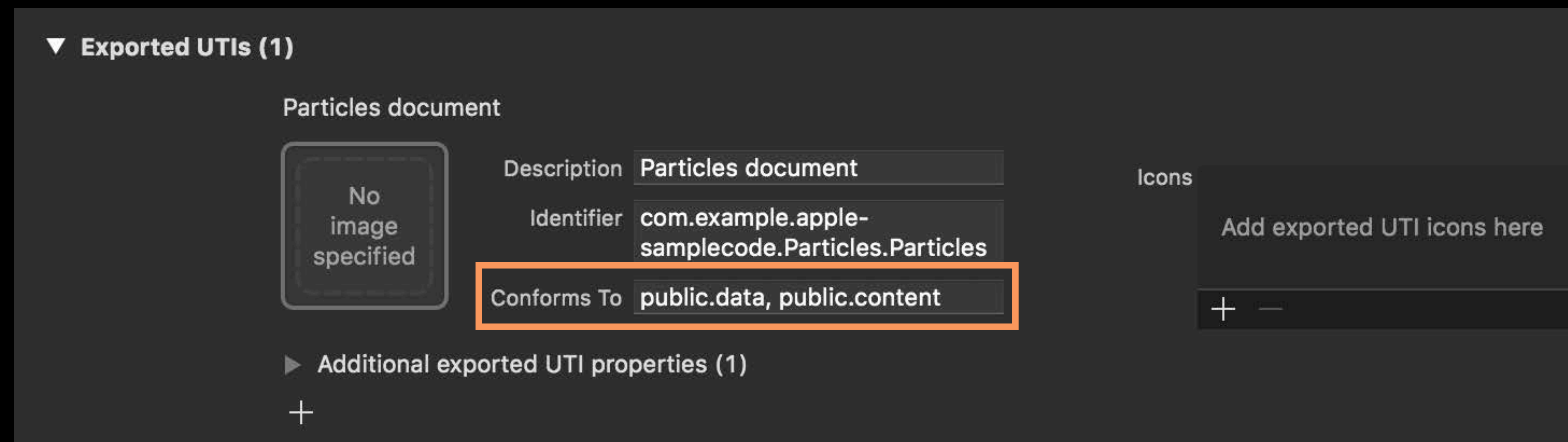
Parent types (the type “conforms to” them) (UTTypeConformsTo)



Declaring a New File Type

A type definition is—

Parent types (the type “conforms to” them) (UTTypeConformsTo)



Type Conformance

Types form a tree

Type Conformance

Types form a tree



public.jpeg

Type Conformance

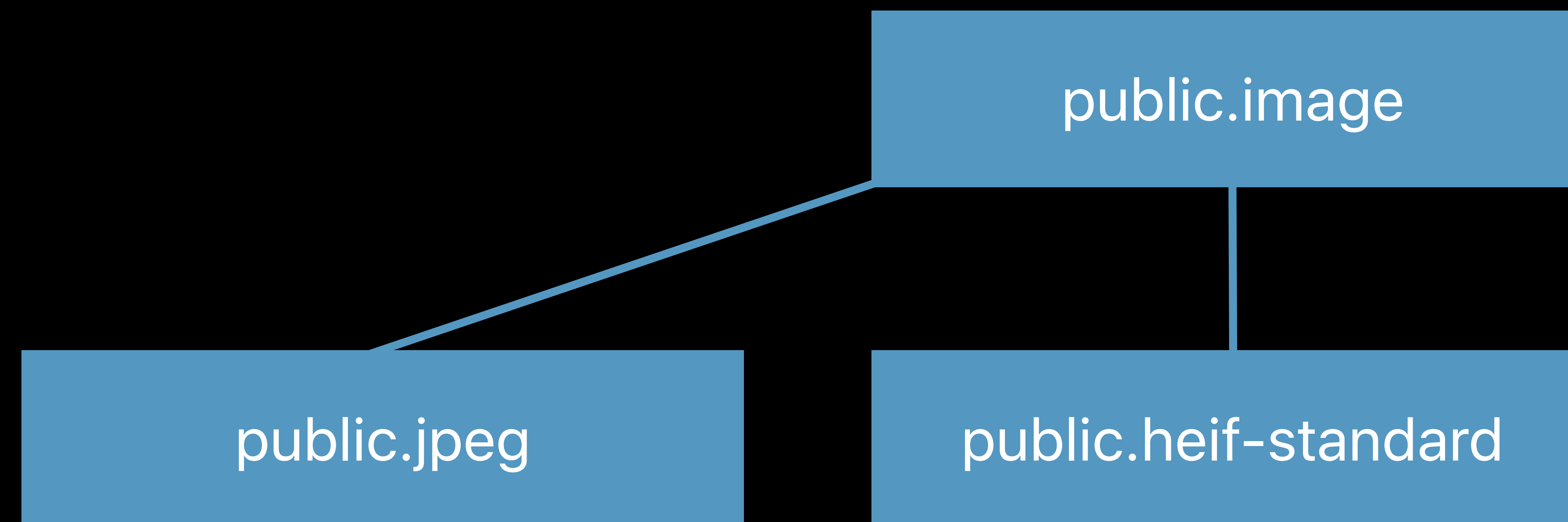
Types form a tree

public.jpeg

public.heif-standard

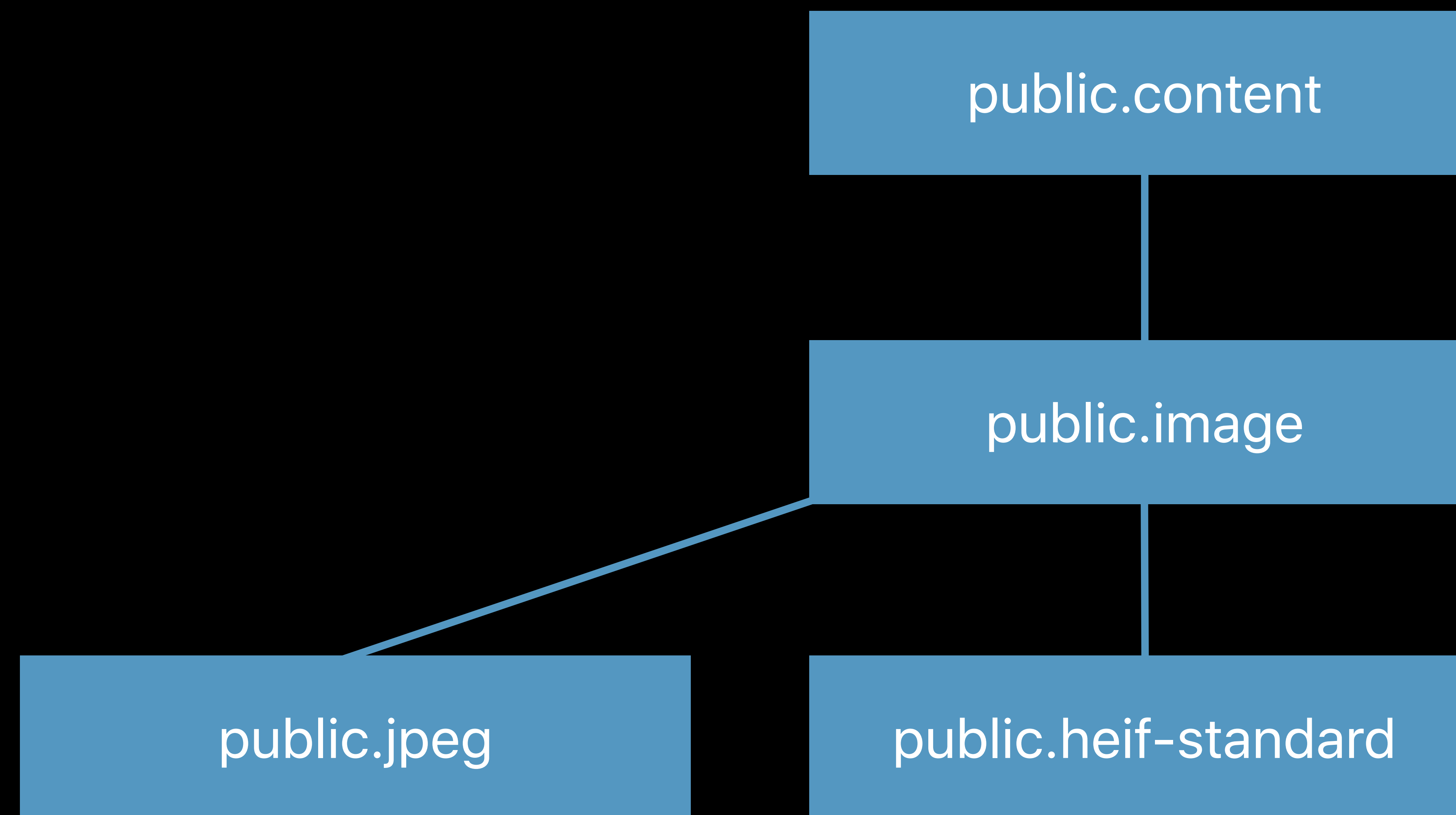
Type Conformance

Types form a tree



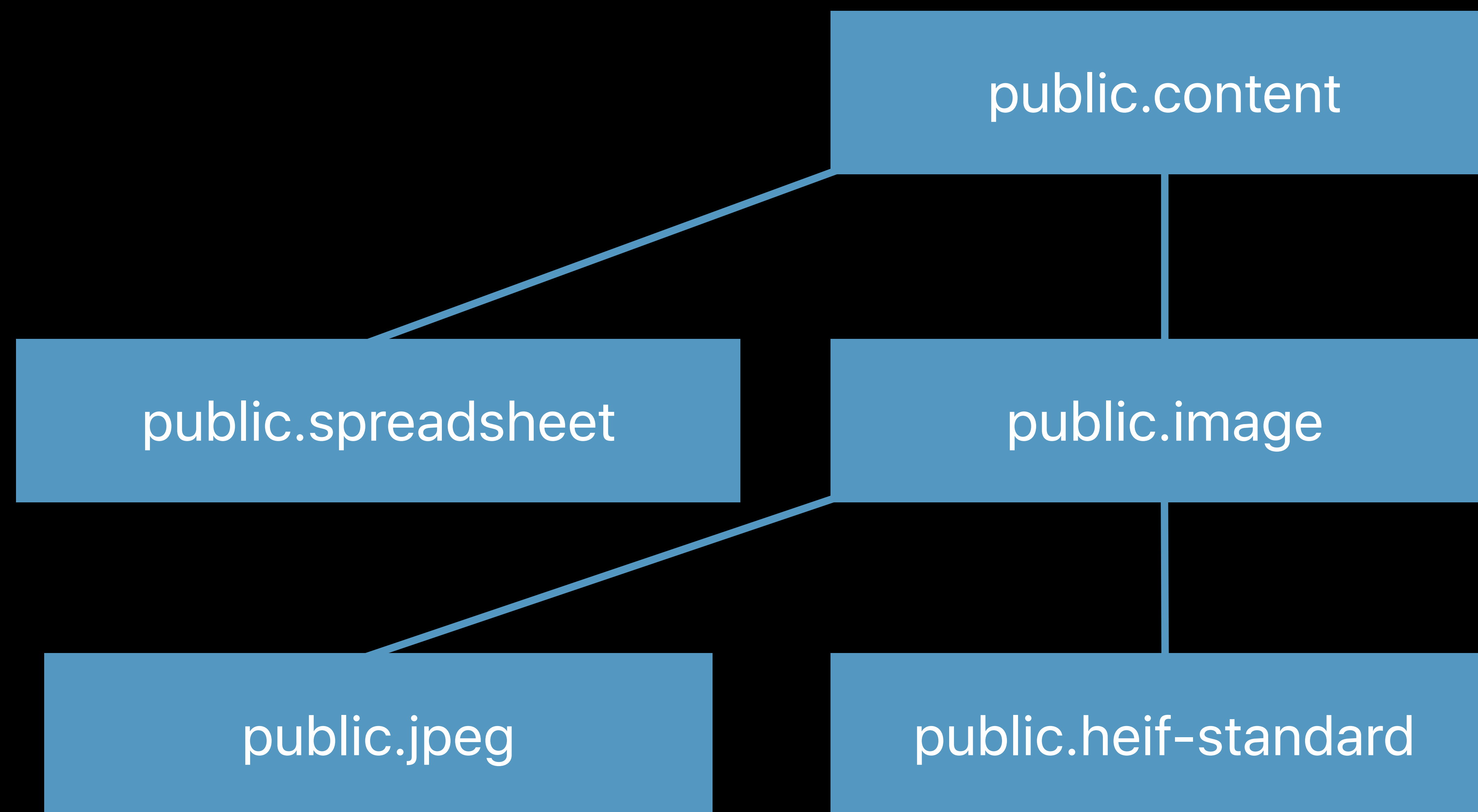
Type Conformance

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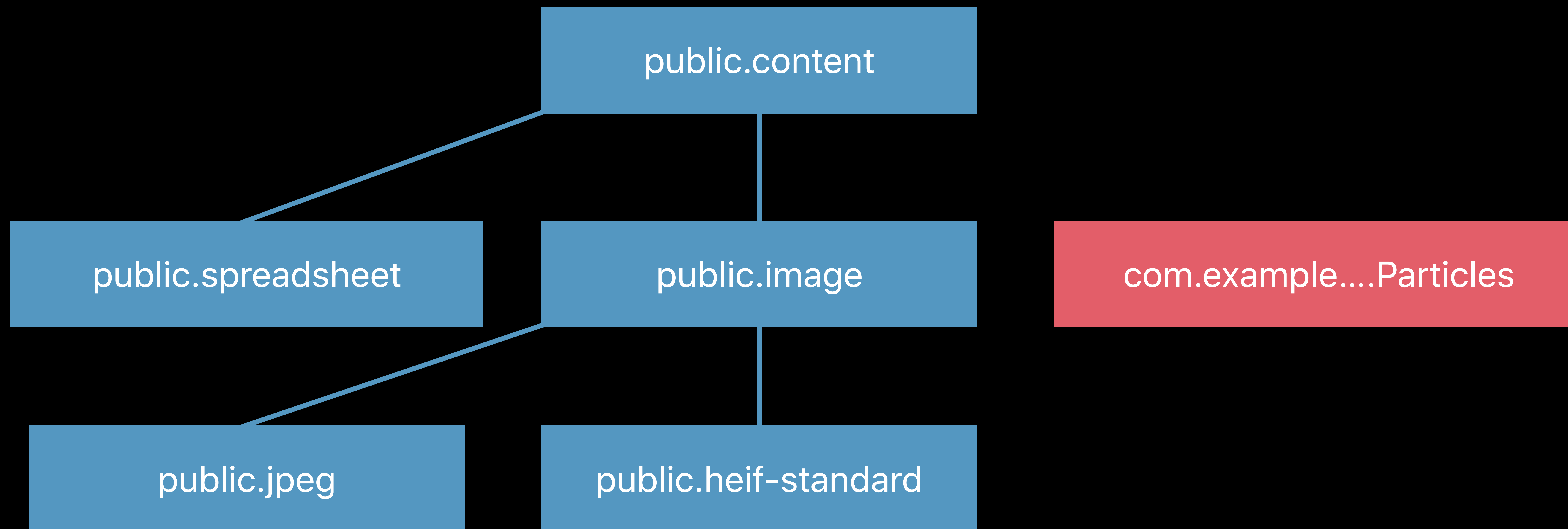
Type Conformance

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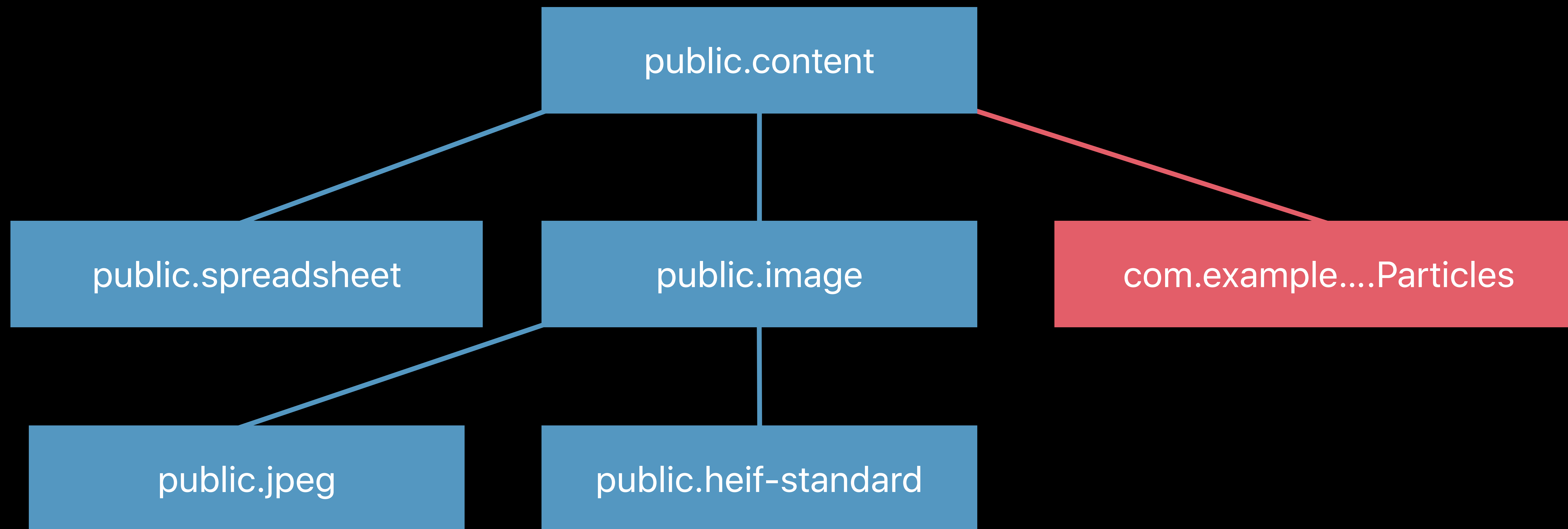
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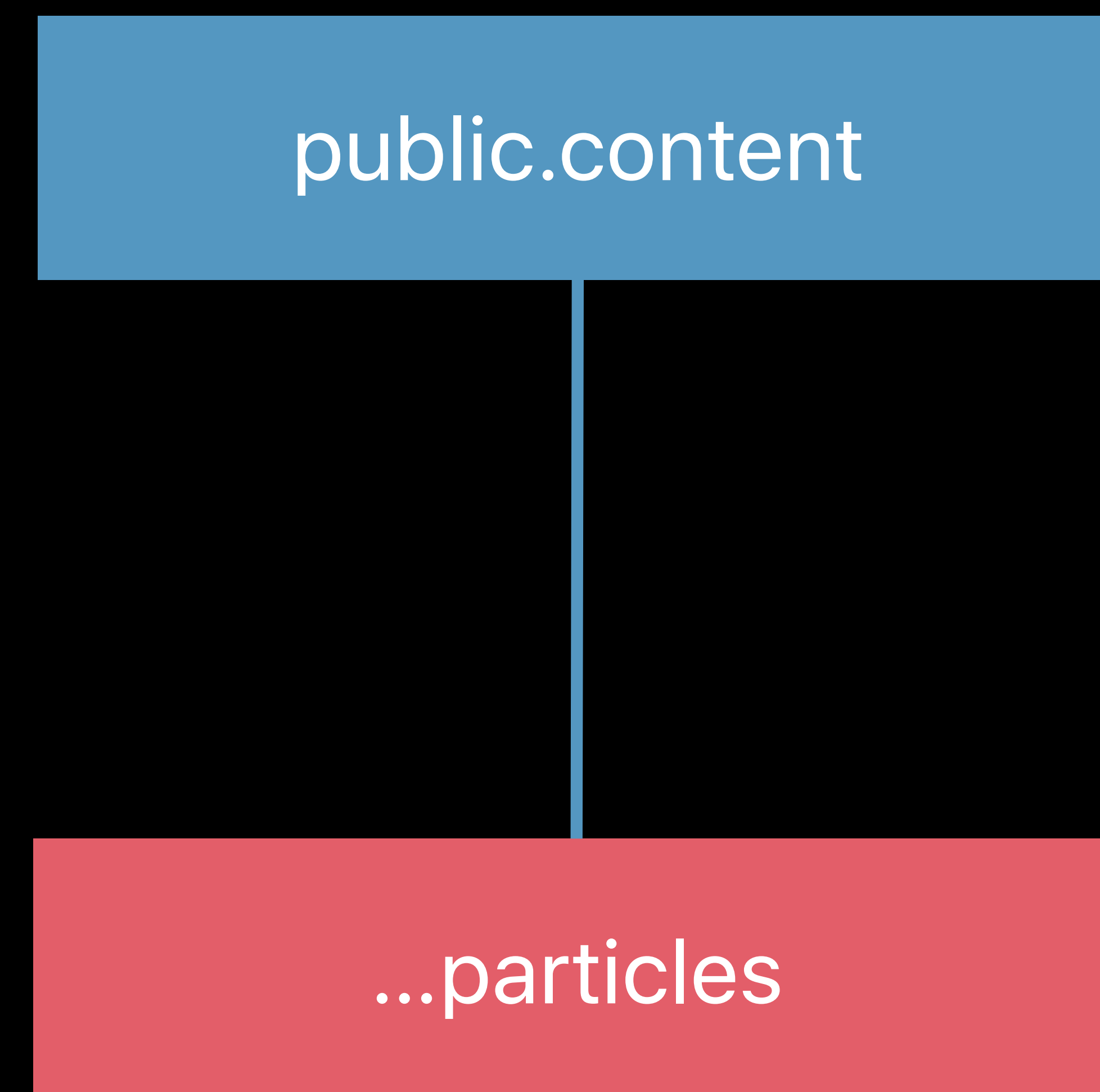
Type Conformance

Types form a tree



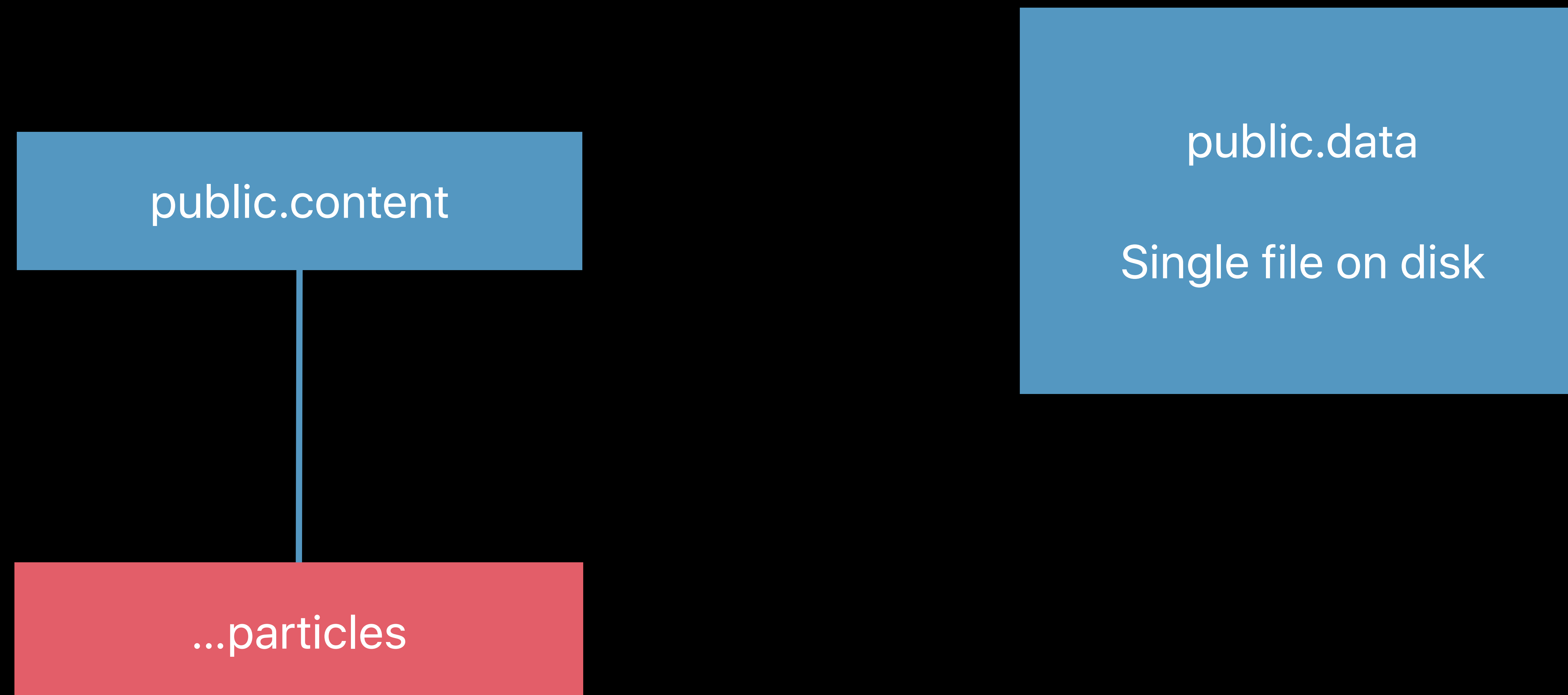
Type Conformance

Second tree to describe the on-disk format



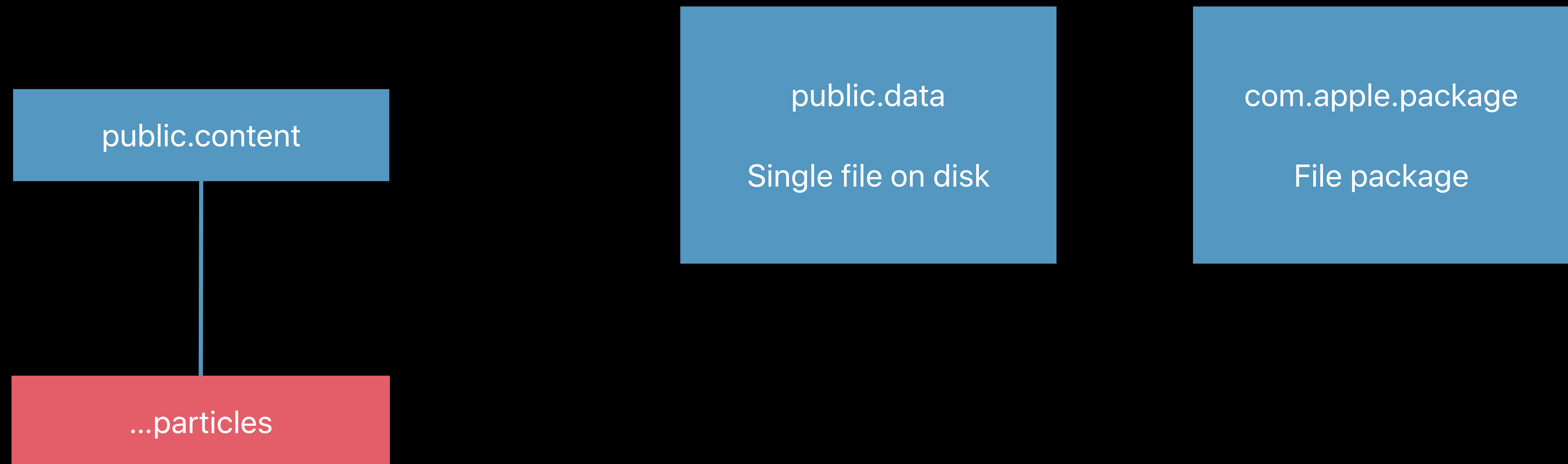
Type Conformance

Second tree to describe the on-disk format



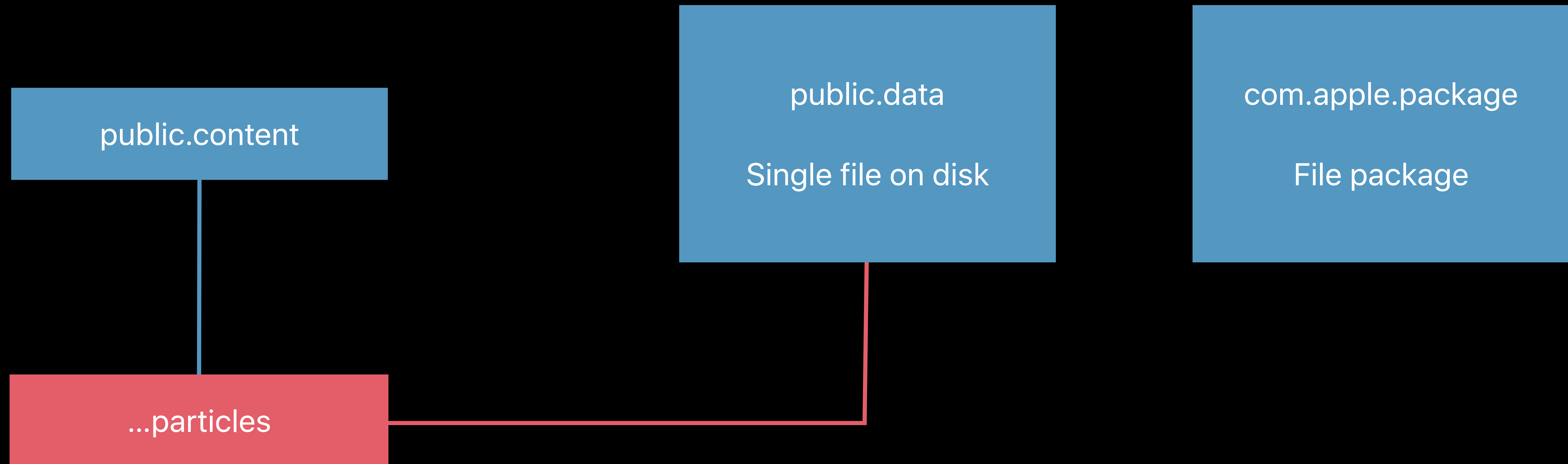
Type Conformance

Second tree to describe the on-disk format



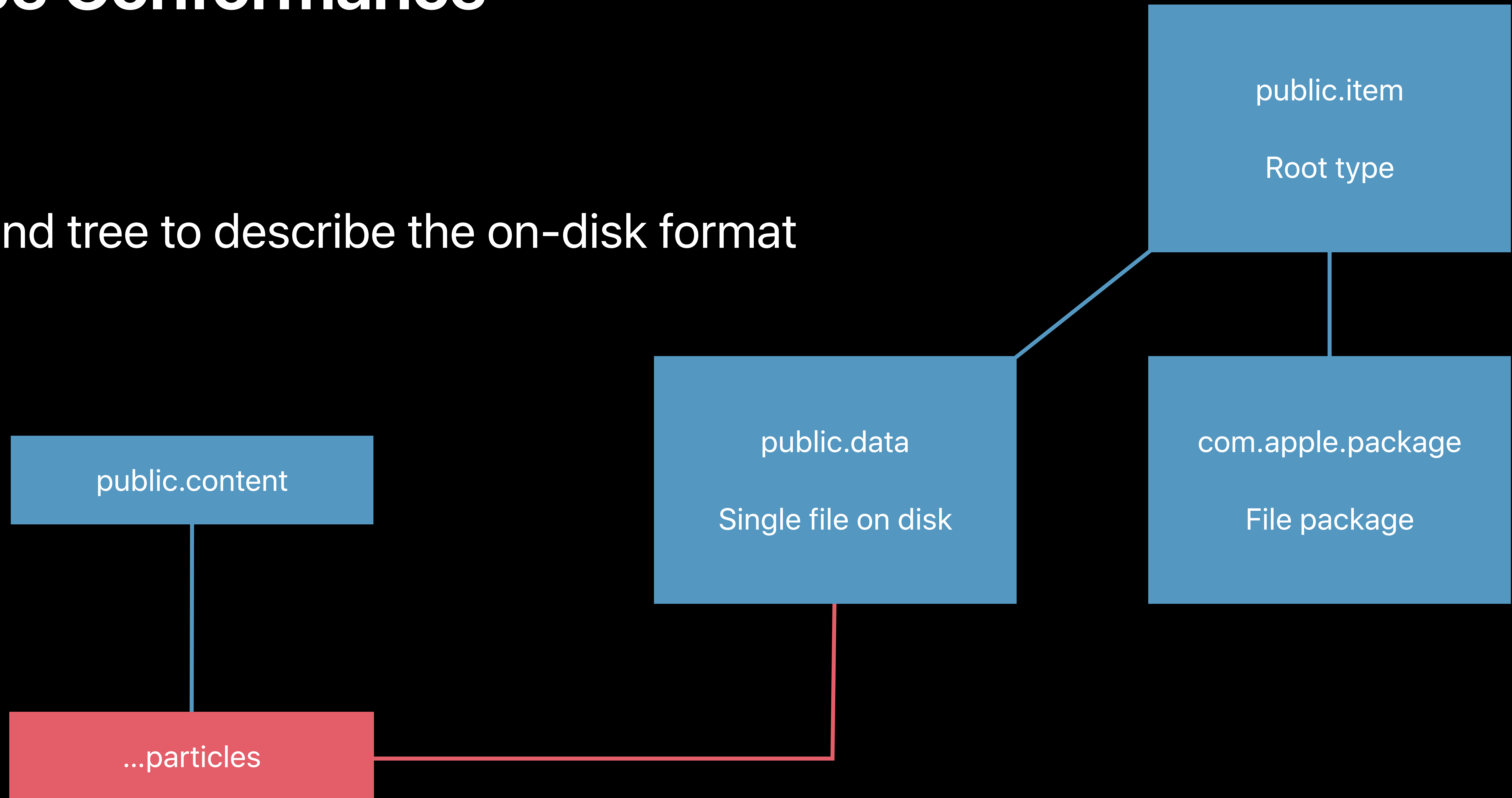
Type Conformance

Second tree to describe the on-disk format



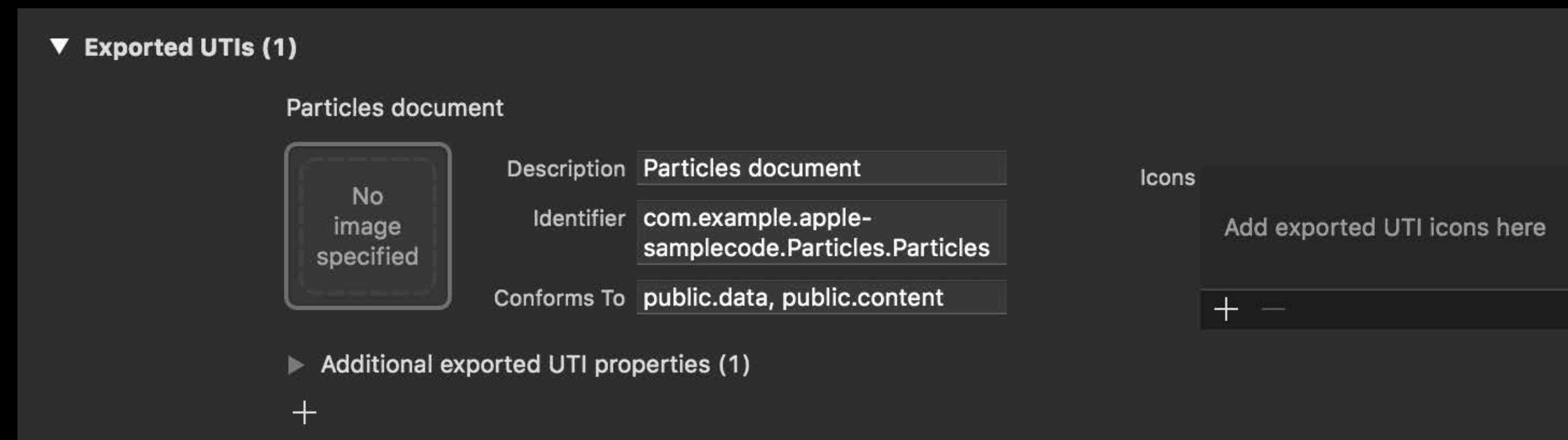
Type Conformance

Second tree to describe the on-disk format



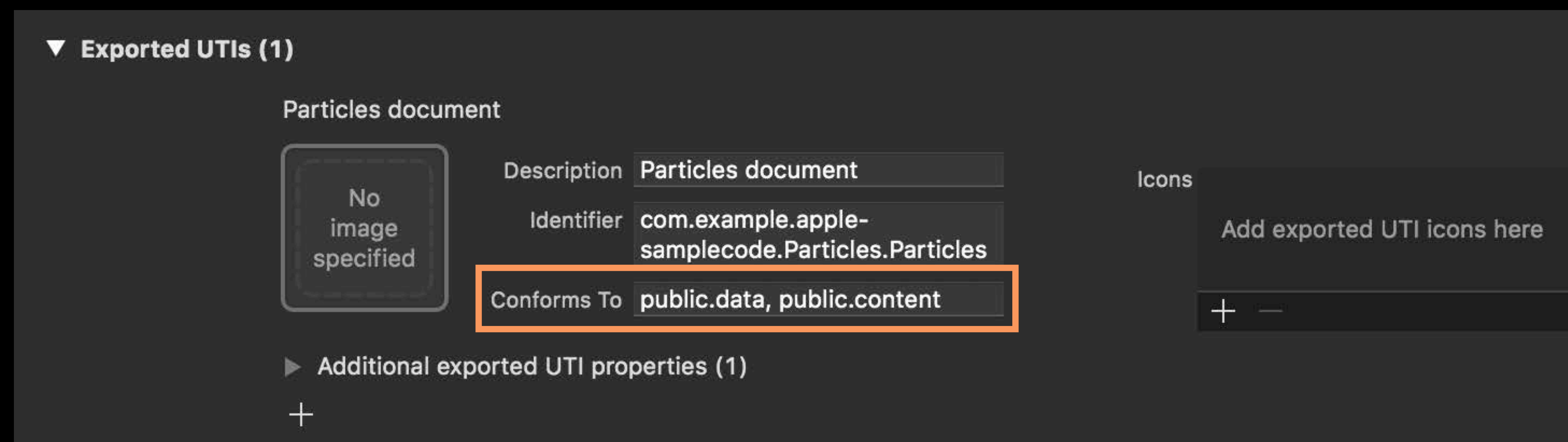
Declaring a New File Type

My type conforms to "public.data, public.content"



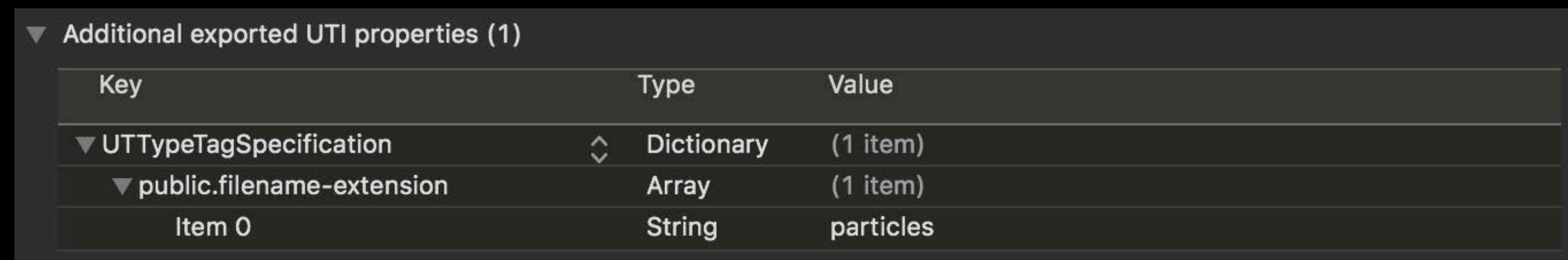
Declaring a New File Type

My type conforms to "public.data, public.content"



Declaring a New File Type

Declaring a file extension—(UTTypeTagSpecification)



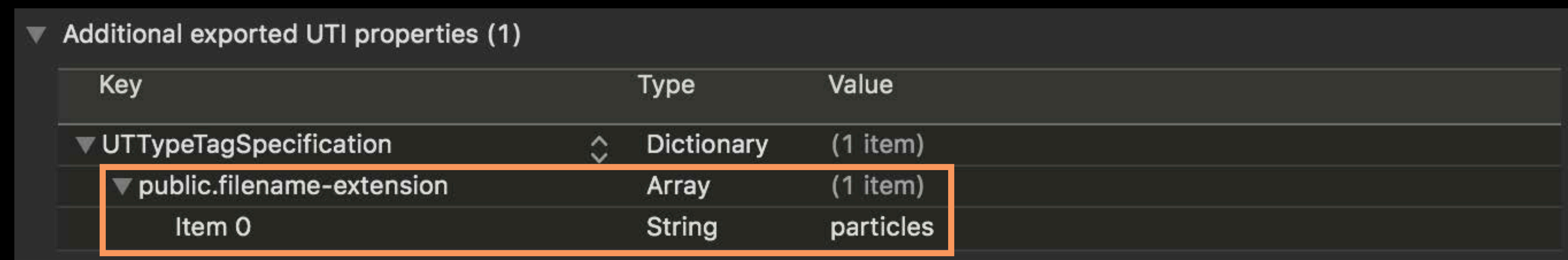
A screenshot of the 'Additional exported UTI properties' table in Xcode. The table has three columns: 'Key', 'Type', and 'Value'. It shows a hierarchy where 'UTTypeTagSpecification' is a Dictionary containing one item, 'public.filename-extension', which is an Array containing one item, 'Item 0', which is a String with the value 'particles'.

Key	Type	Value
▼ UTTypeTagSpecification	Dictionary	(1 item)
▼ public.filename-extension	Array	(1 item)
Item 0	String	particles

“Files with the .particles extension are of this type”

Declaring a New File Type

Declaring a file extension—(UTTypeTagSpecification)



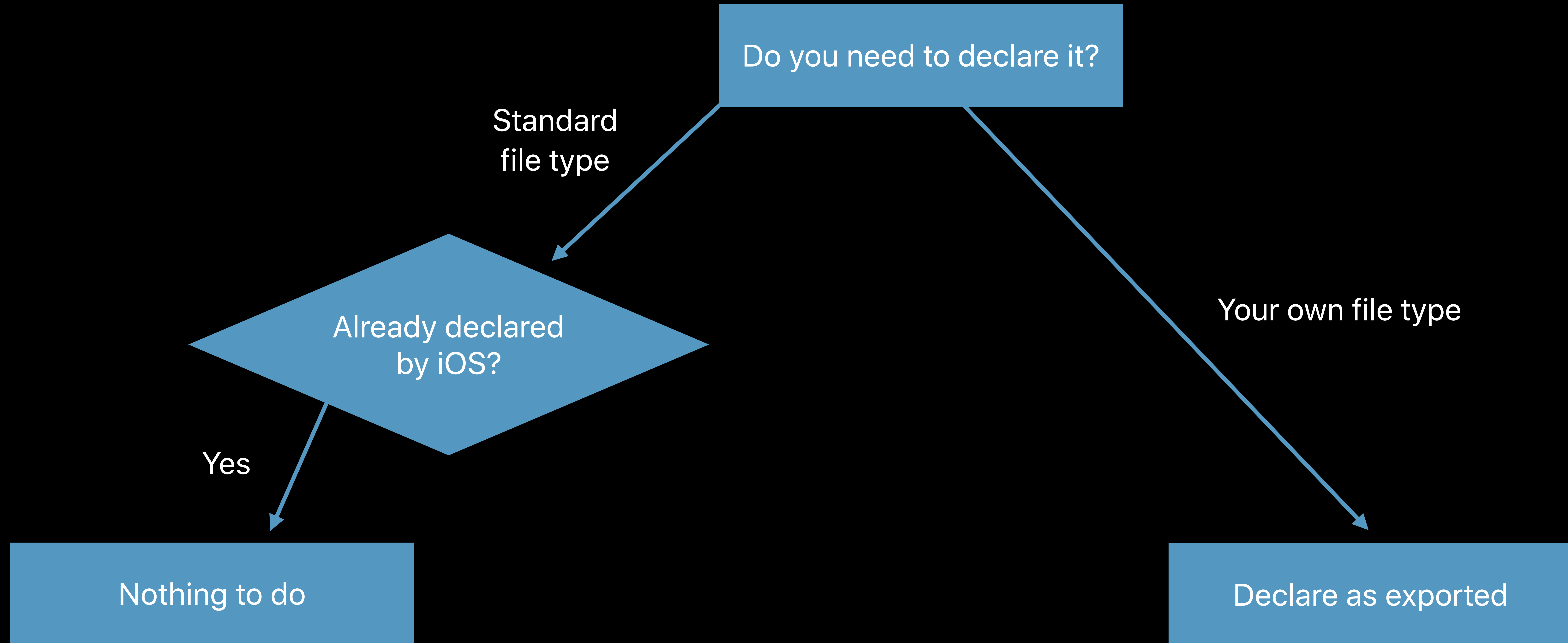
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Key	Type	Value
▼ UTTypeTagSpecification	Dictionary	(1 item)
▼ public.filename-extension	Array	(1 item)
Item 0	String	particles

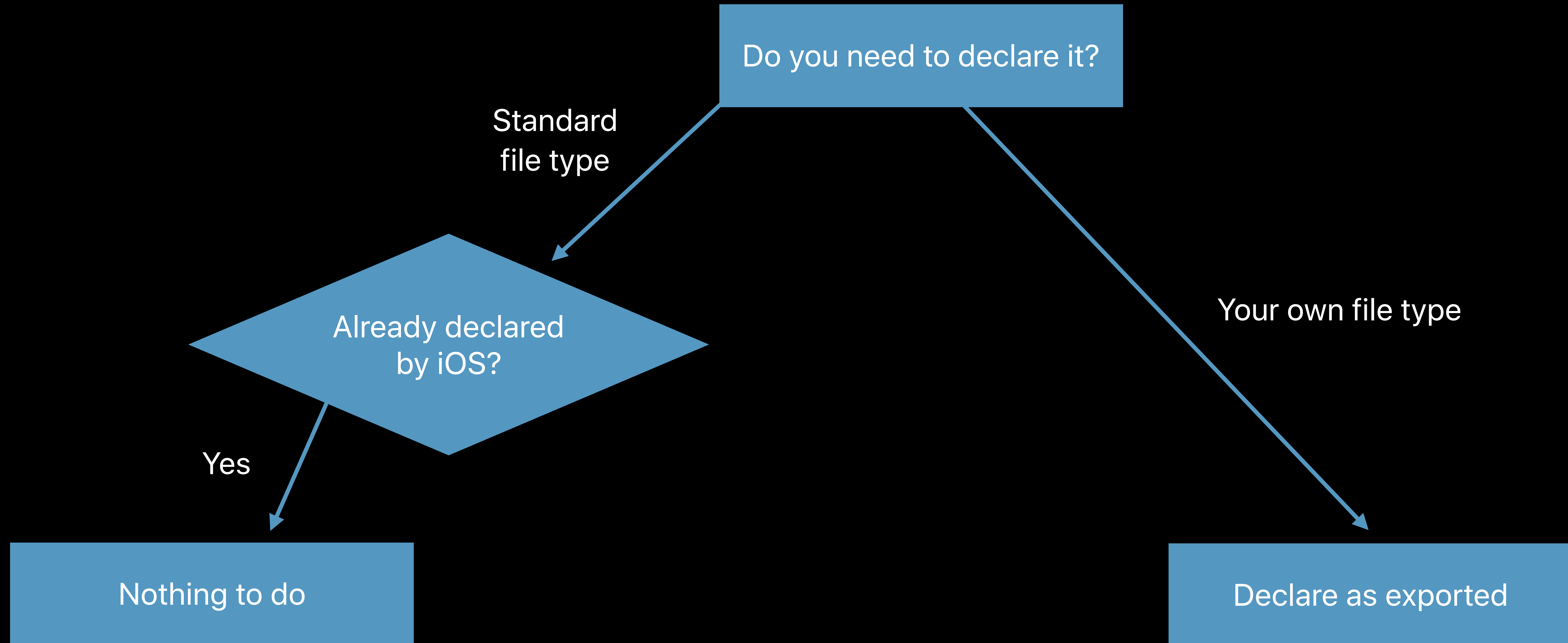
“Files with the .particles extension are of this type”

Declaration—done!

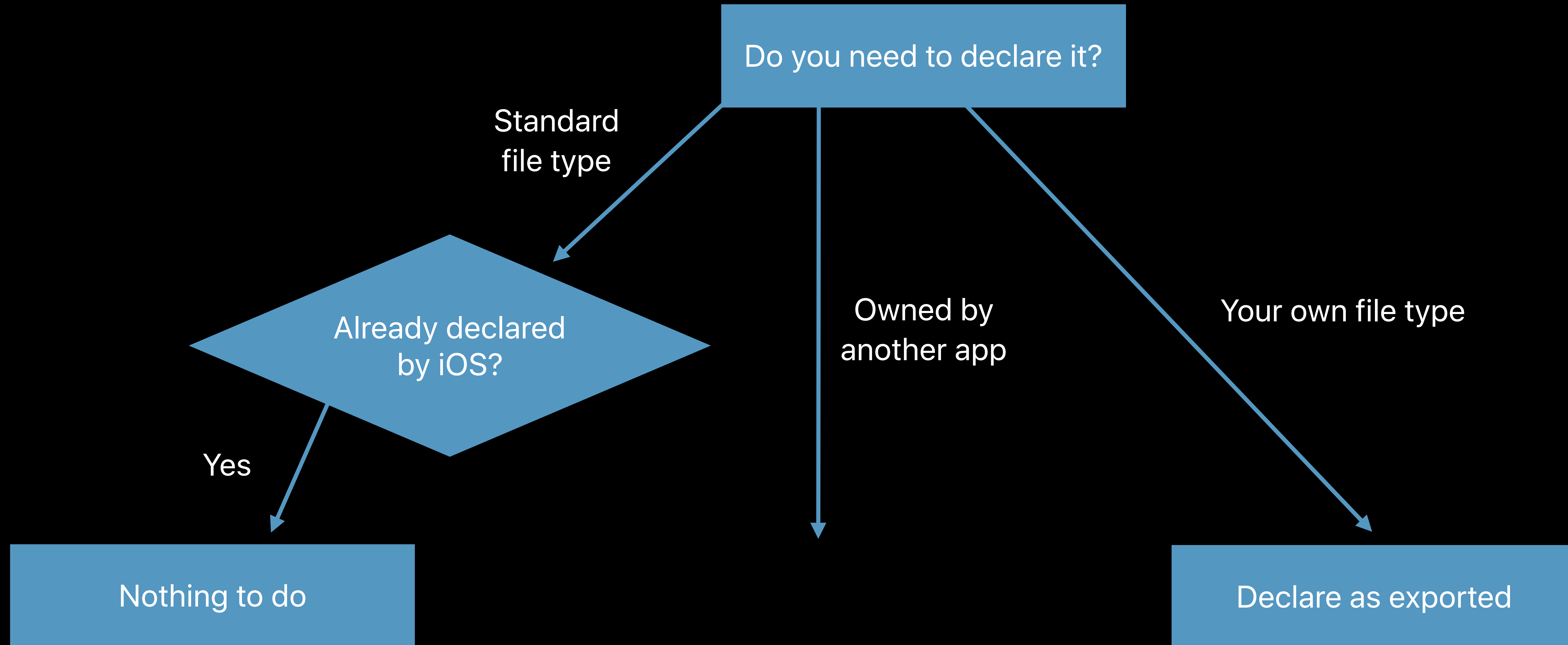
Declaring a Type



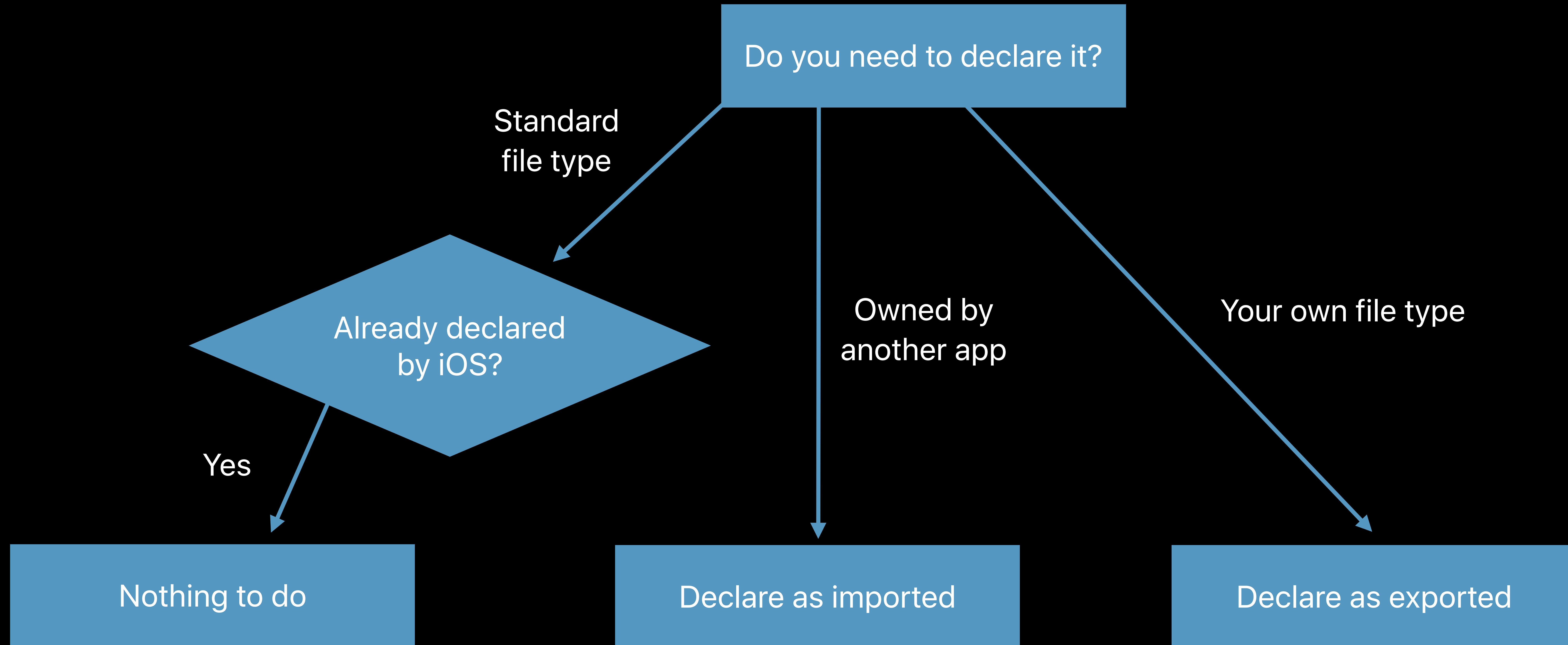
Declaring a Type



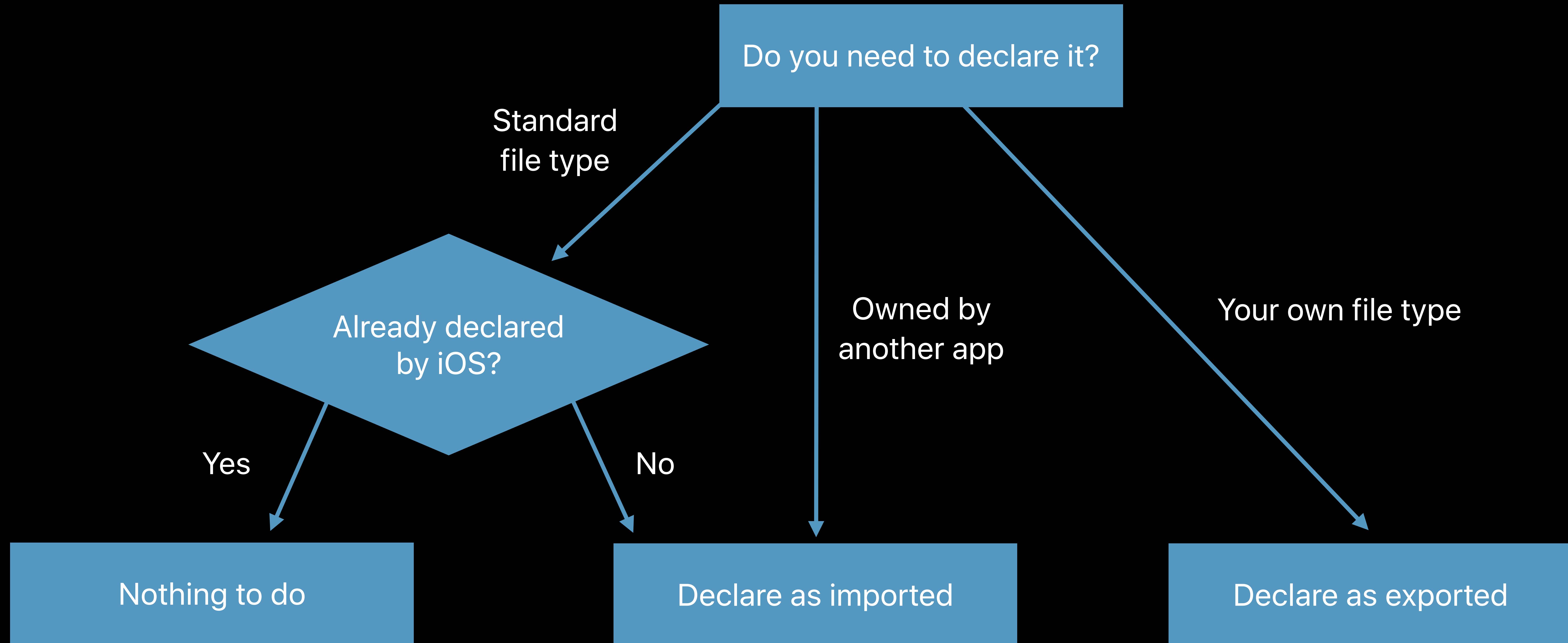
Declaring a Type



Declaring a Type

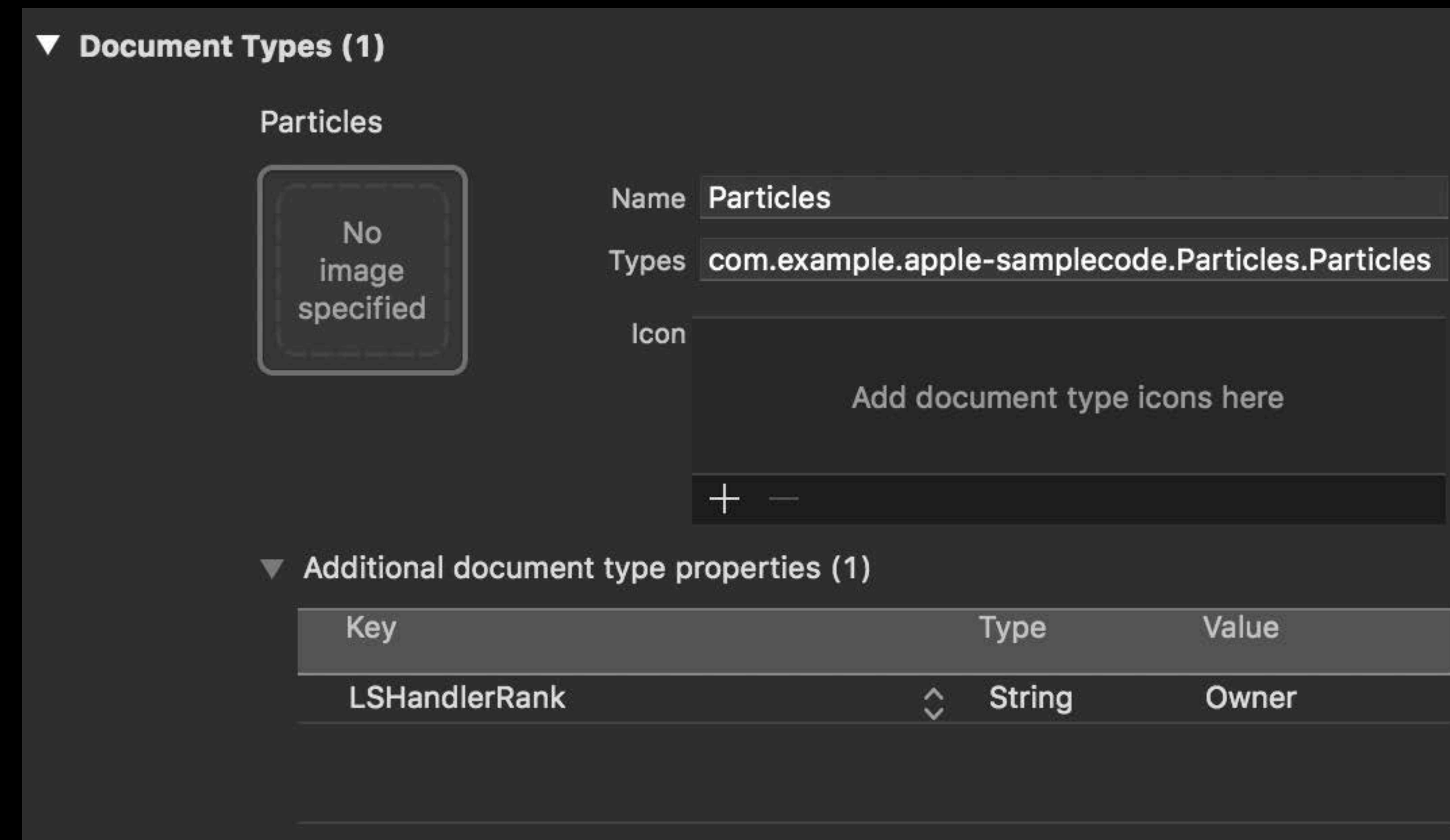


Declaring a Type



Claiming Support for a Type

Once the type is defined, you need to claim support for it in Info.plist



Claiming Support for a Type

Type identifier defined previously

▼ Document Types (1)

Particles

No image specified

Name

Types

Icon

Add document type icons here

+ -

▼ Additional document type properties (1)

Key	Type	Value
LSHandlerRank	String	Owner

Claiming Support for a Type

Type identifier defined previously

The screenshot shows a configuration window for document types. It features a section for 'Particles' with a placeholder for an icon and a table for 'Additional document type properties (1)'. The 'Types' field is highlighted with an orange border.

▼ Document Types (1)

Particles

No image specified

Name: Particles

Types: **com.example.apple-samplecode.Particles.Particles**

Icon

Add document type icons here

+ -

▼ Additional document type properties (1)

Key	Type	Value
LSHandlerRank	String	Owner

Claiming Support for a Type—Handler Rank

▼ Document Types (1)

Particles

Name

Types

Icon

Add document type icons here

+ -

▼ Additional document type properties (1)

Key	Type	Value
LSHandlerRank	String	Owner

Claiming Support for a Type—Handler Rank

▼ Document Types (1)

Particles

No image specified

Name

Types

Icon

Add document type icons here

+ -

▼ Additional document type properties (1)

Key	Type	Value
LSHandlerRank	String	Owner

Claiming Support for a Type—Handler Rank

Three choices

▼ Document Types (1)

Particles

No image specified

Name

Types

Icon

Add document type icons here

+ -

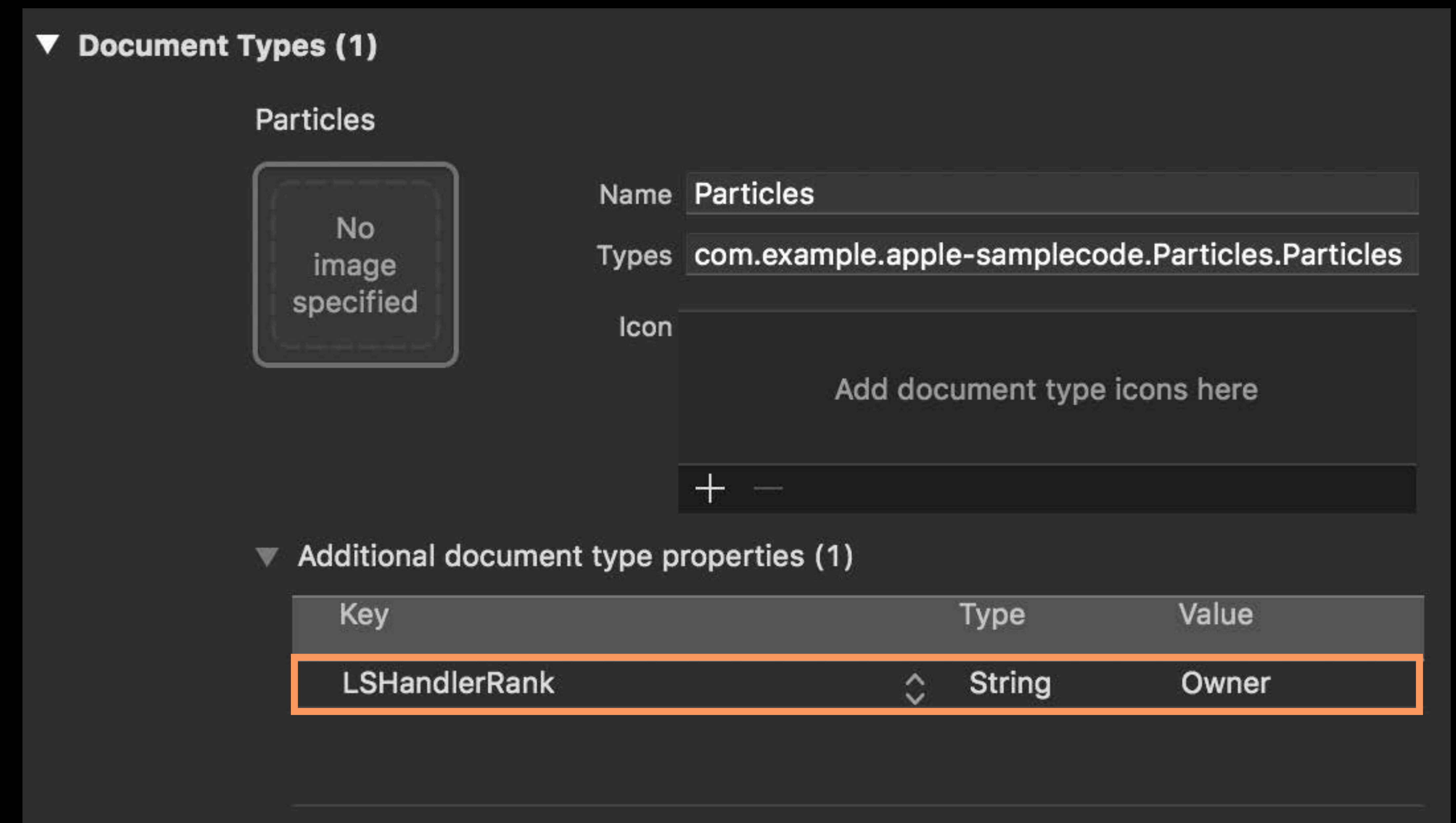
▼ Additional document type properties (1)

Key	Type	Value
LSHandlerRank	String	Owner

Claiming Support for a Type—Handler Rank

Three choices

Owner if you own this type

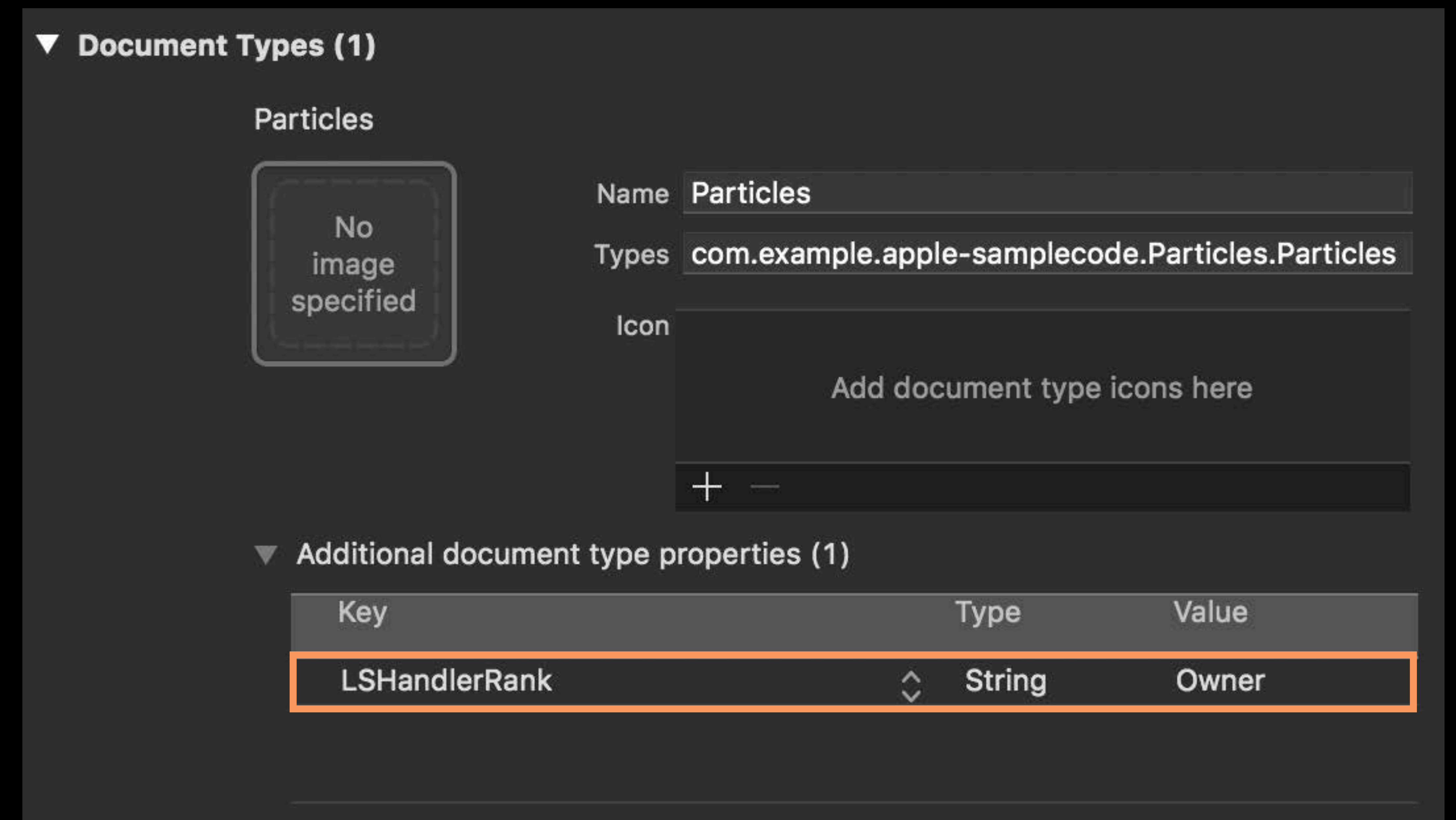


Claiming Support for a Type—Handler Rank

Three choices

Owner if you own this type

Default if you can edit this type



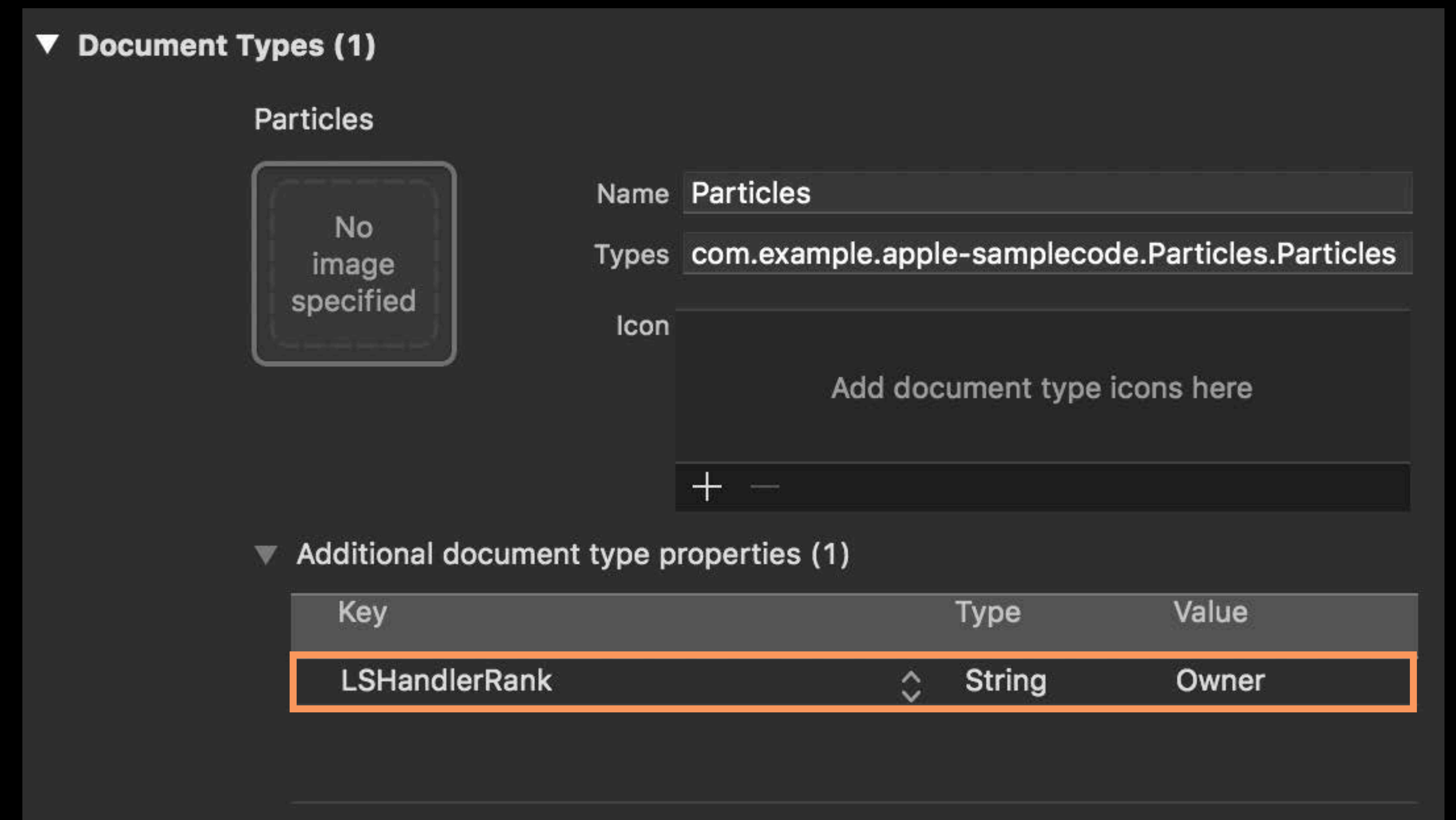
Claiming Support for a Type—Handler Rank

Three choices

Owner if you own this type

Default if you can edit this type

Alternate if you can read it



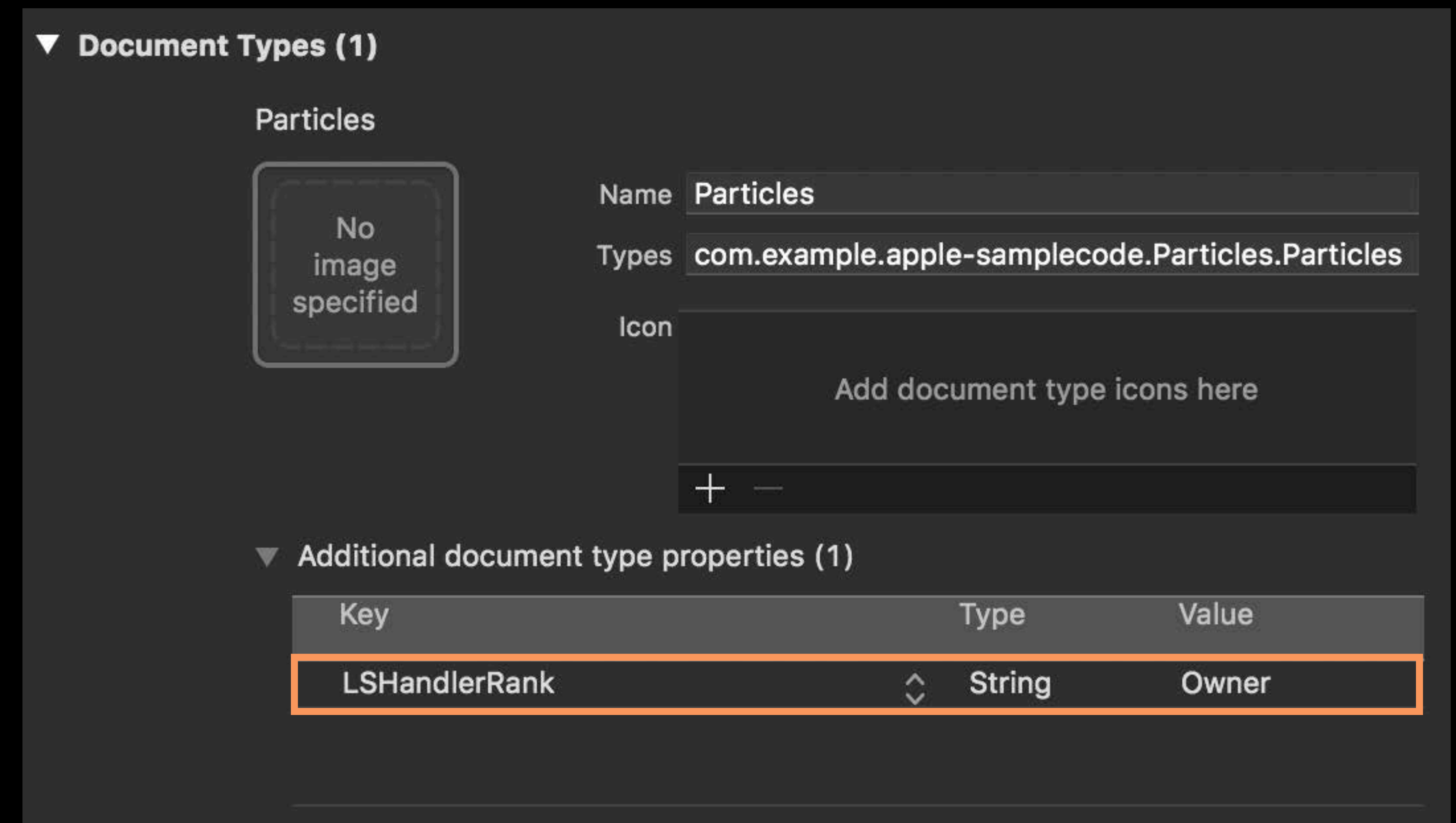
Claiming Support for a Type—Handler Rank

Three choices

Owner if you own this type

Default if you can edit this type

Alternate if you can read it



⚠ Rules are different on macOS

Claiming Support for a Type

Be as specific as possible

Don't claim support for catch-alls like `public.data` or `public.content`

What Can You Do?

What Can You Do?

Use a Document Browser or Document Picker to access documents

What Can You Do?

Use a Document Browser or Document Picker to access documents

Your customers can access their favorite cloud vendor

What Can You Do?

Use a Document Browser or Document Picker to access documents

Your customers can access their favorite cloud vendor

Consider using `UIDocumentBrowserViewController` instead of your custom browser

What Can You Do?

Use a Document Browser or Document Picker to access documents

Your customers can access their favorite cloud vendor

Consider using `UIDocumentBrowserViewController` instead of your custom browser

Configure the Document Types supported by your app in Xcode

Raising the Bar

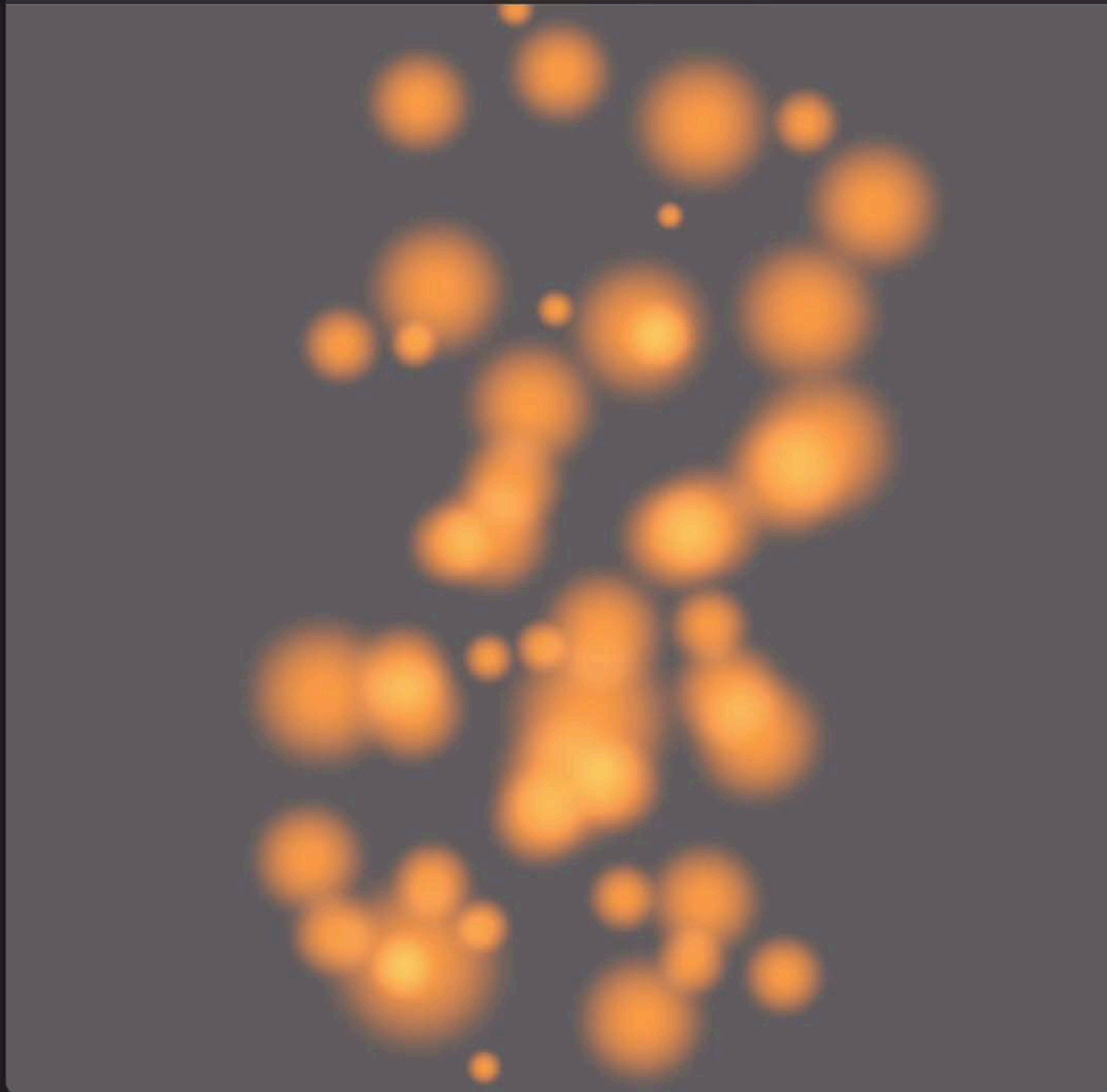
Rony Fadel, Software Engineer

9:41 AM

100 %

Done

Nice Particles.particles



Inspector



Birth Rate



Lifespan



Size



Size Variation



Spreading Angle



Color



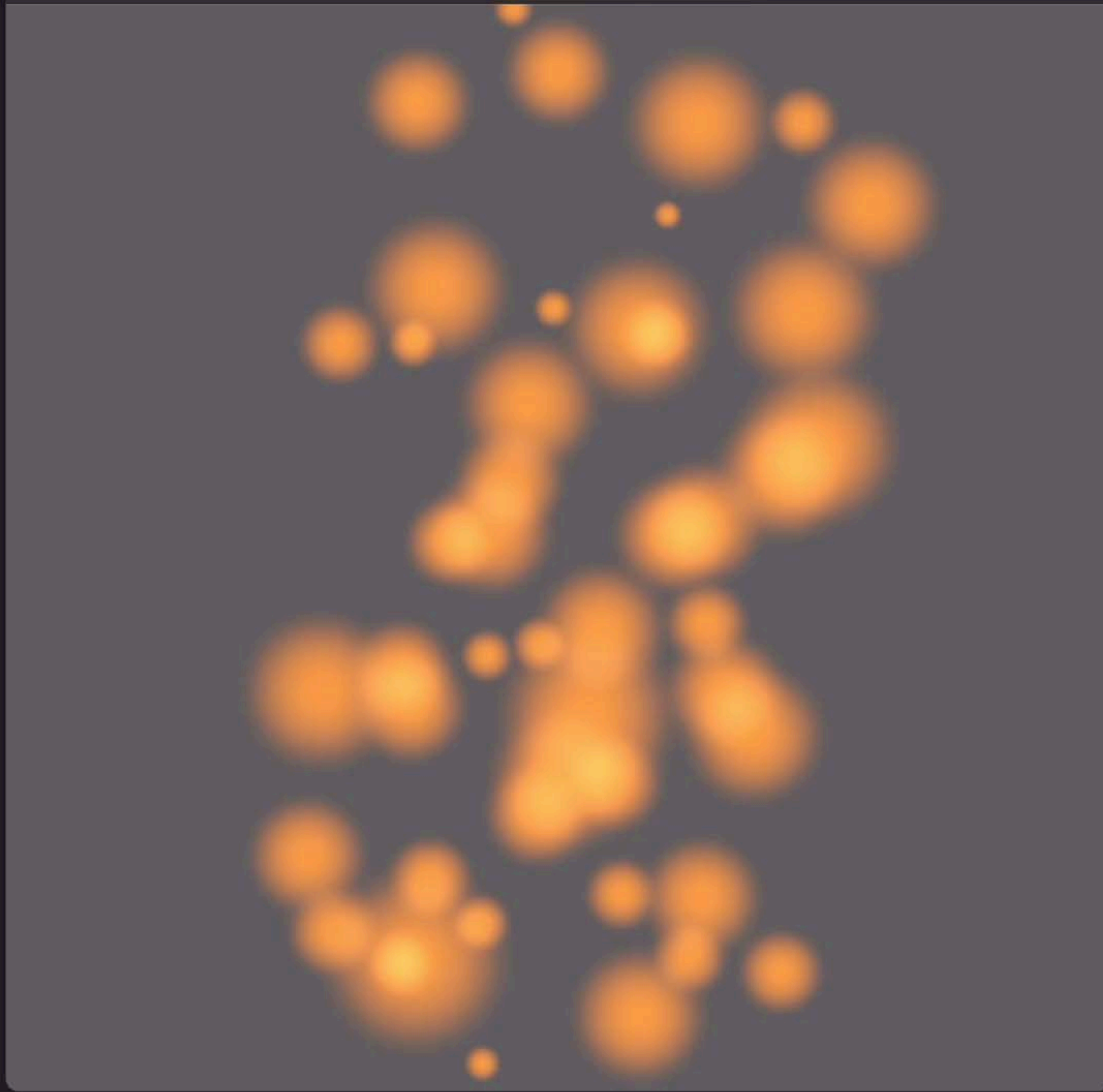
9:41 AM

100 %

Done

Nice Particles.particles

Inspector



Birth Rate



Lifespan



Size



Size Variation



Spreading Angle



Color



Your App and the Sandbox

```
// MARK: UIDocumentBrowserViewControllerDelegate
func documentBrowser(_ controller: UIDocumentBrowserViewController,
                    didPickDocumentURLs documentURLs: [URL])

// MARK: UIDocumentPickerDelegate
func documentPicker(_ controller: UIDocumentPickerViewController,
                  didPickDocumentsAt urls: [URL])
```

Your App and the Sandbox

```
// MARK: UIDocumentBrowserViewControllerDelegate
func documentBrowser(_ controller: UIDocumentBrowserViewController,
                    didPickDocumentURLs documentURLs: [URL])

// MARK: UIDocumentPickerDelegate
func documentPicker(_ controller: UIDocumentPickerViewController,
                  didPickDocumentsAt urls: [URL])
```

Your App and the Sandbox

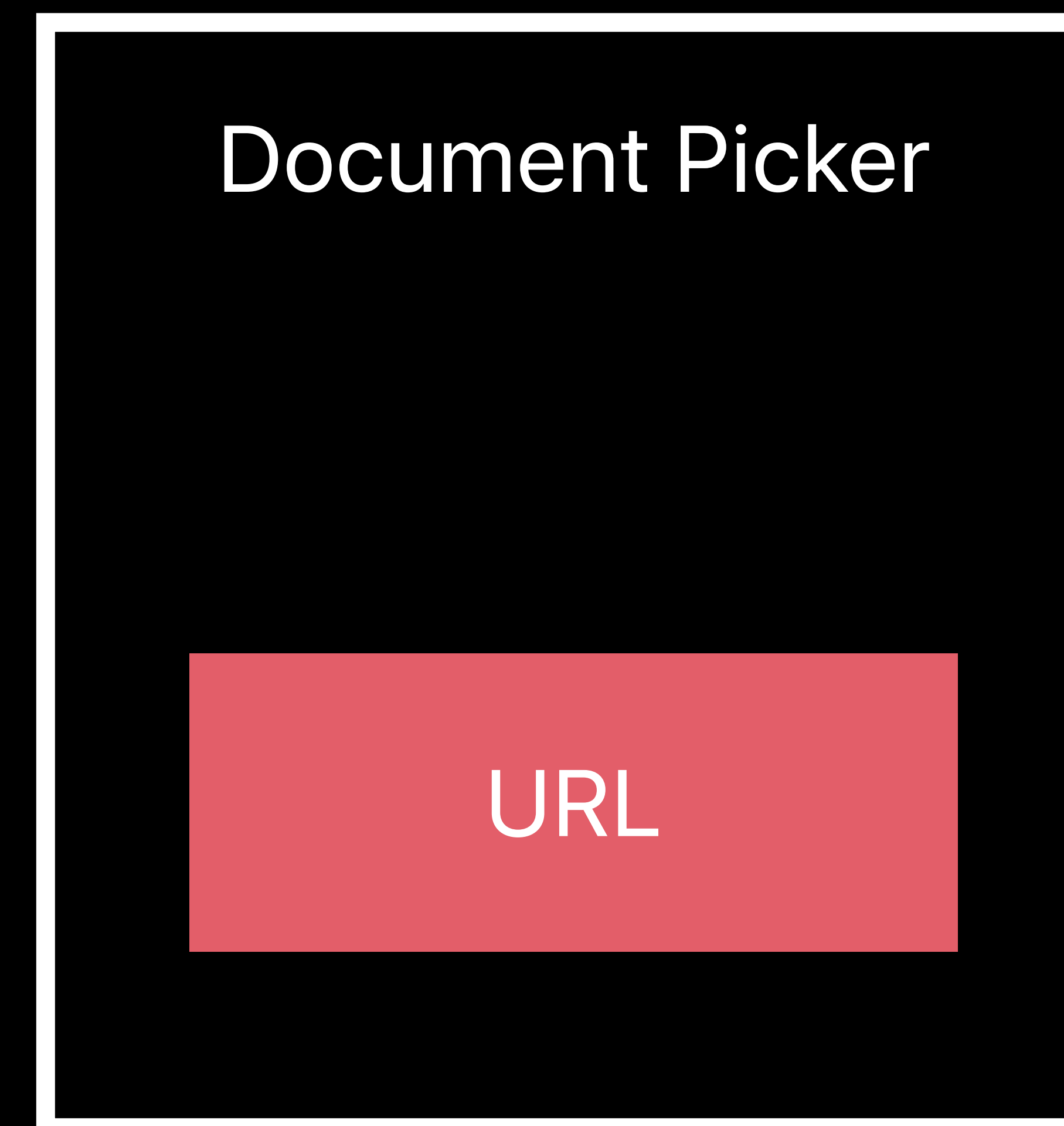
```
// MARK: UIDocumentBrowserViewControllerDelegate
func documentBrowser(_ controller: UIDocumentBrowserViewController,
                    didPickDocumentURLs documentURLs: [URL])

// MARK: UIDocumentPickerDelegate
func documentPicker(_ controller: UIDocumentPickerViewController,
                  didPickDocumentsAt urls: [URL])
```

Your App and the Sandbox



Your App



Your App and the Sandbox



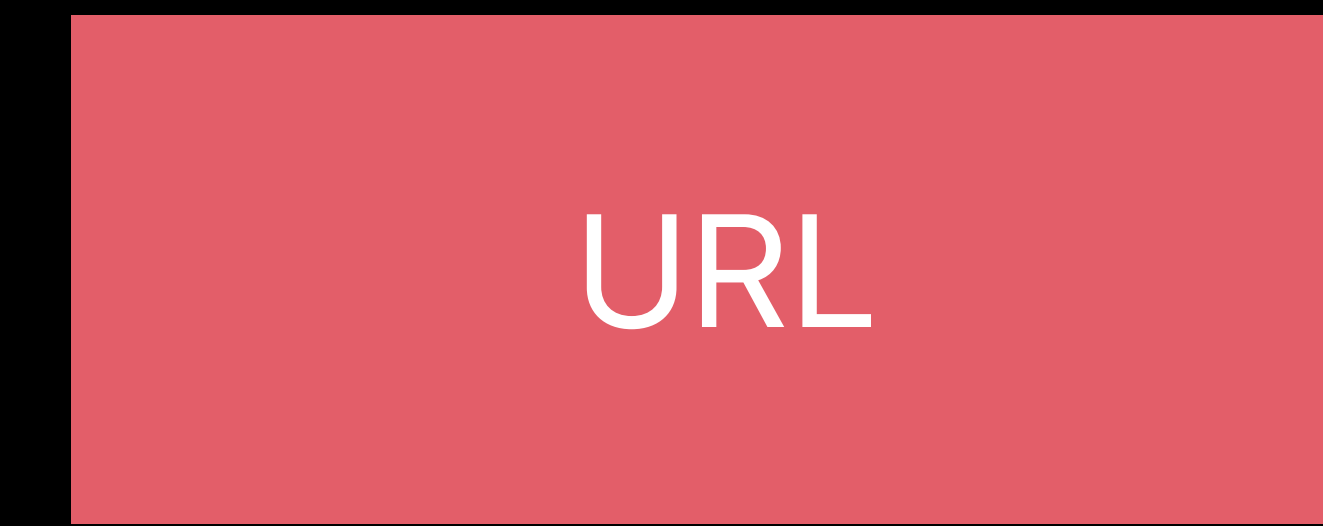
Your App

URL

Your App and the Sandbox

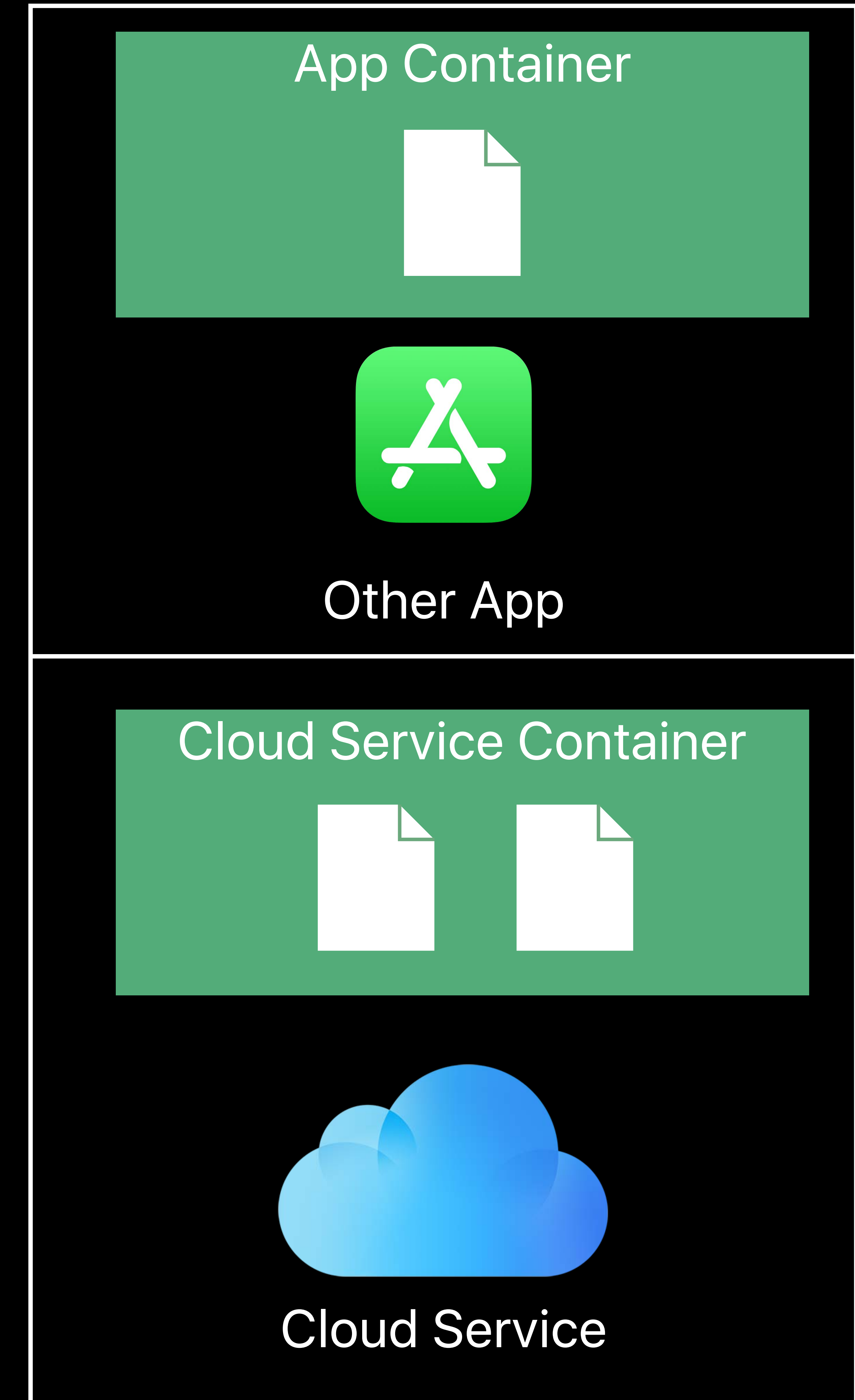
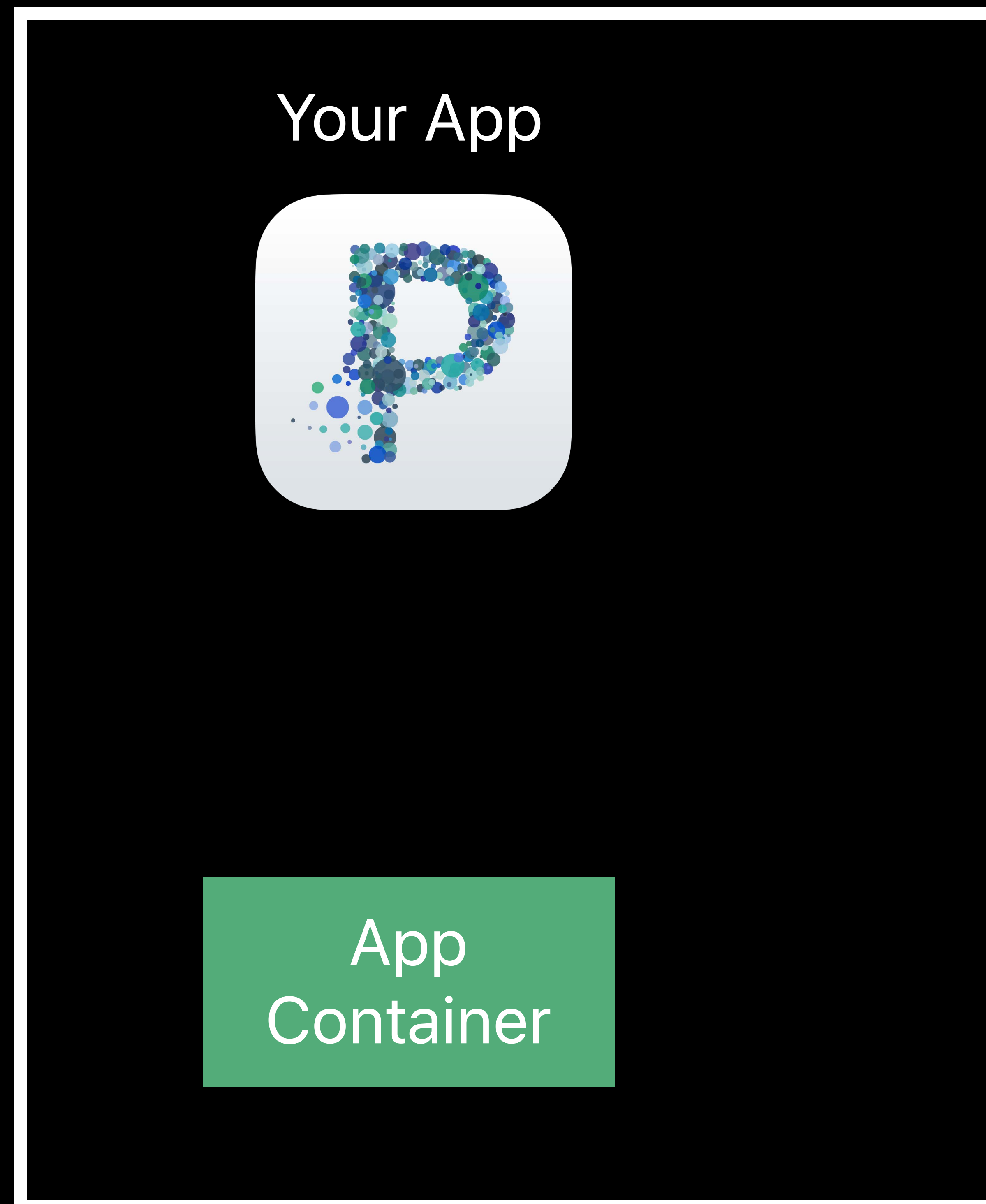


Your App

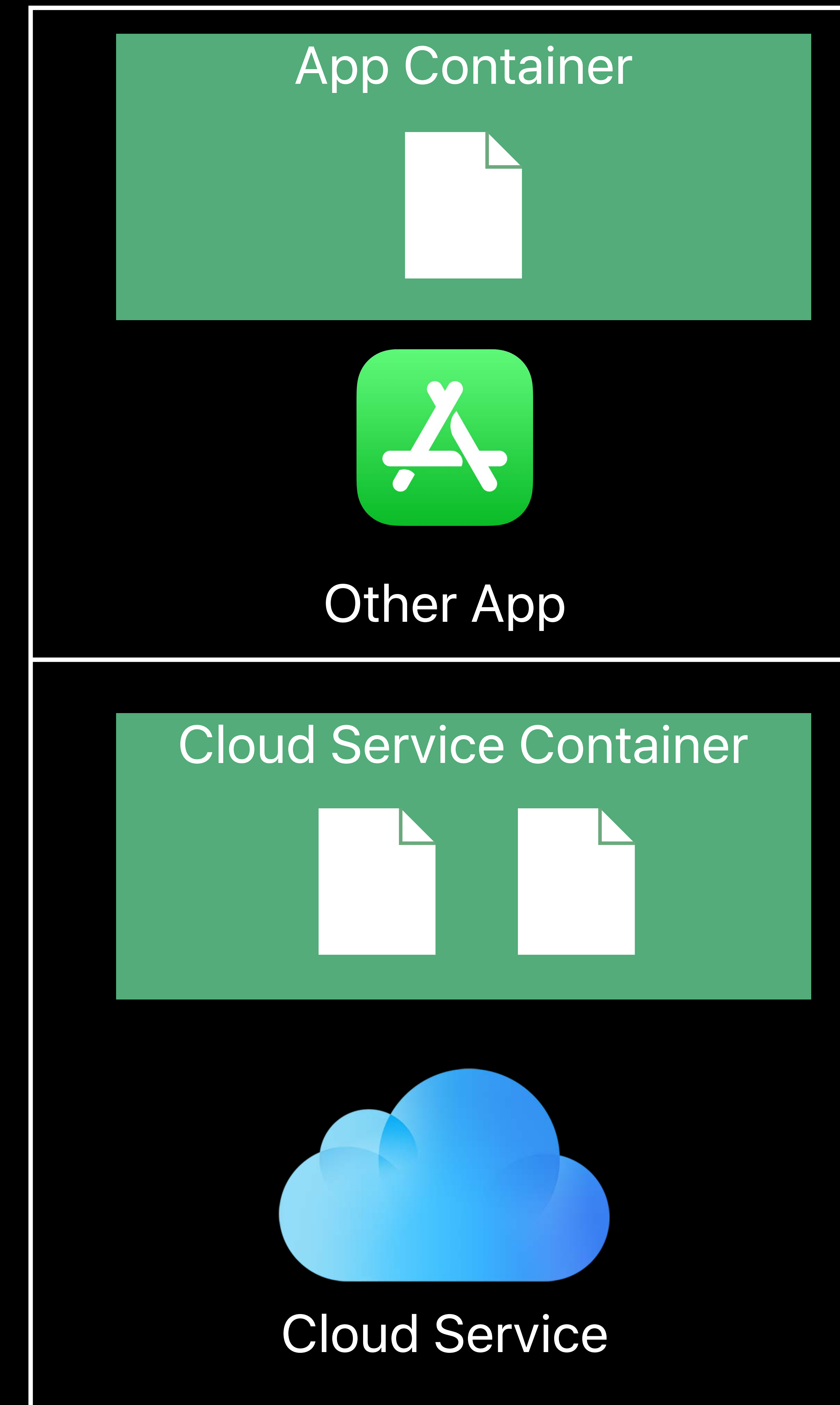
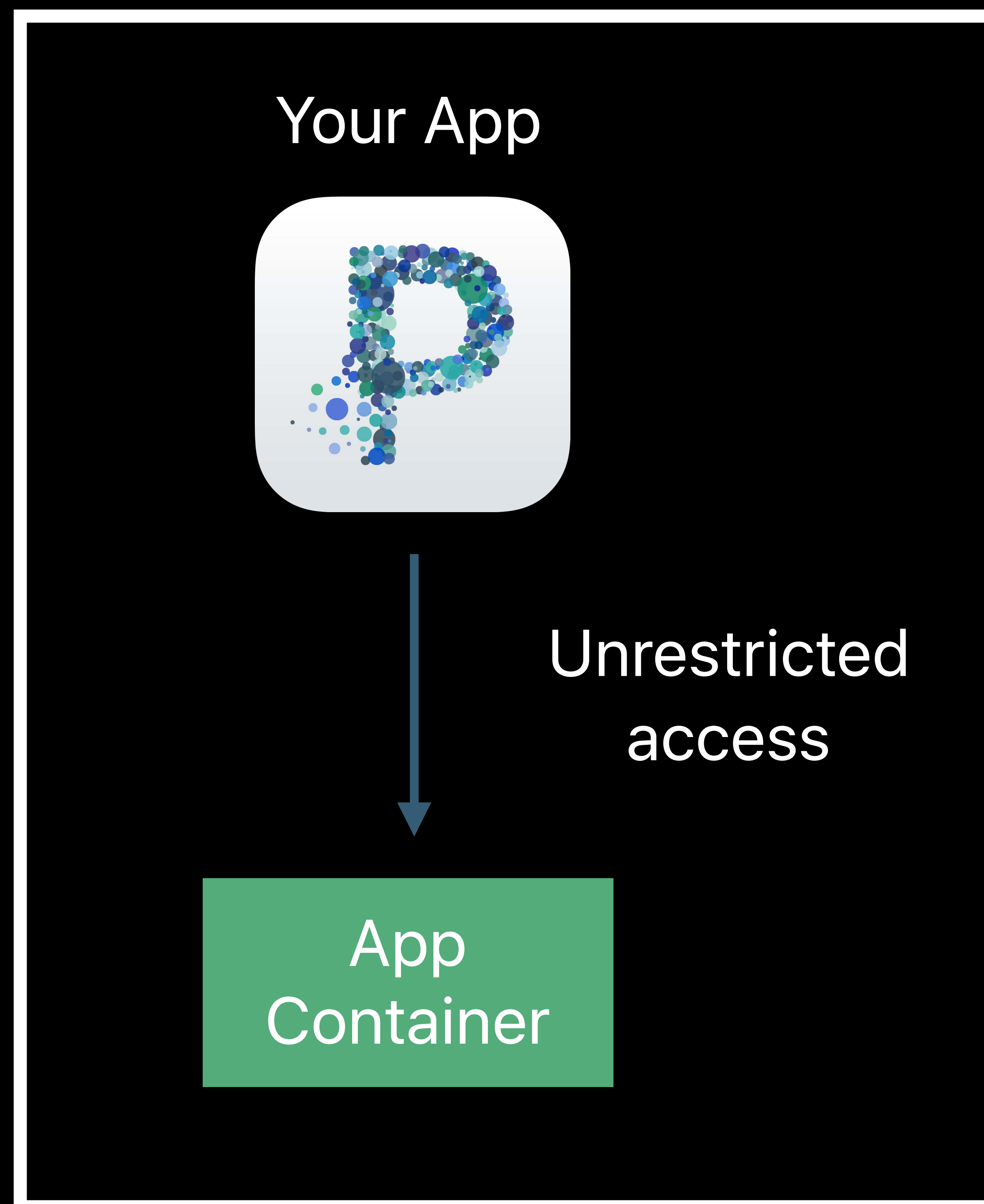


```
Error Domain=NSCocoaErrorDomain Code=257 "The file "<filename>" couldn't be opened because you don't have permission to view it." UserInfo={NSFilePath=<path-to-document>, NSUnderlyingError=0xFFFFFFFF {Error Domain=NSPOSIXErrorDomain Code=1 "Operation not permitted"}}
```

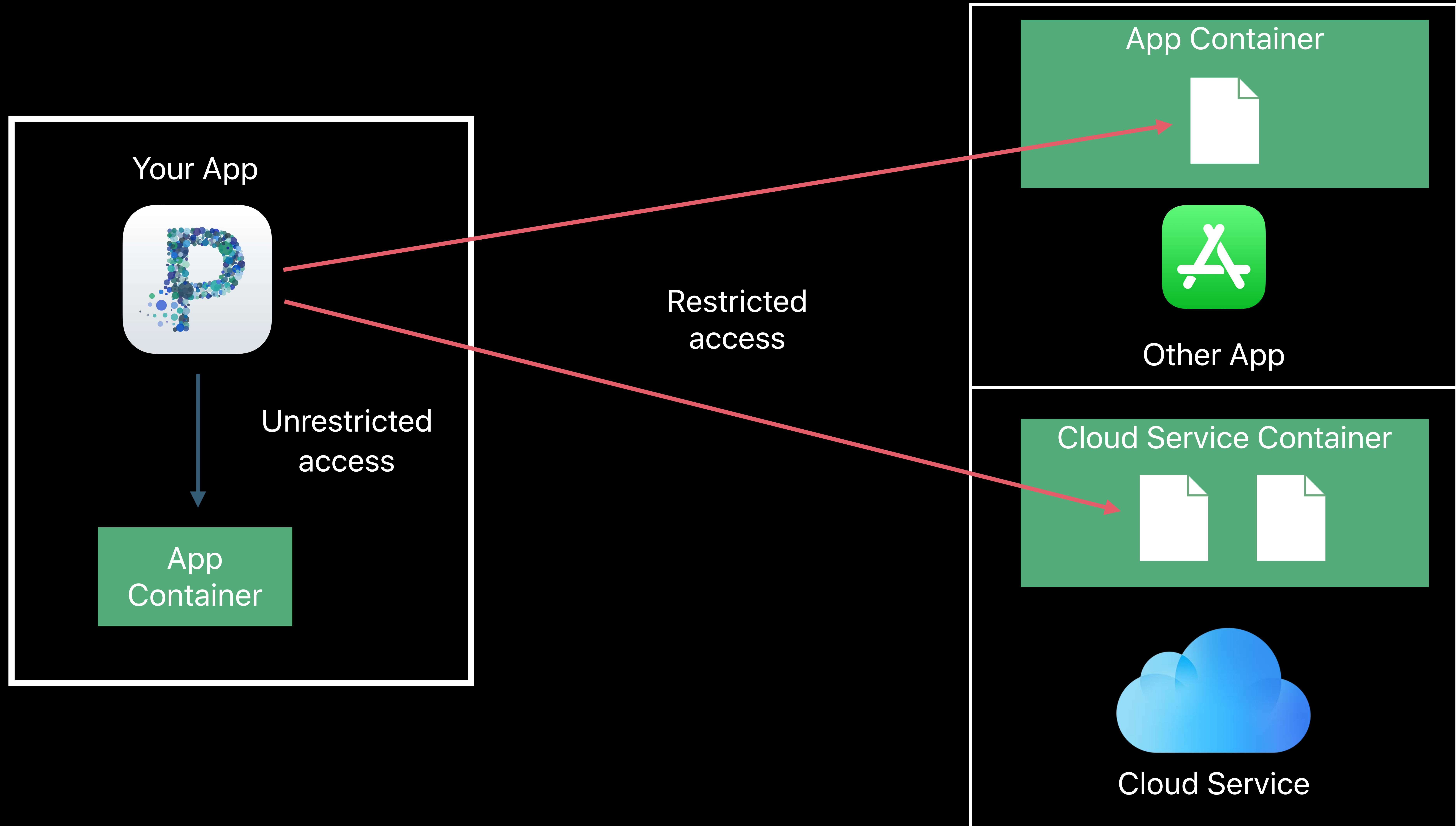
Your App and the Sandbox



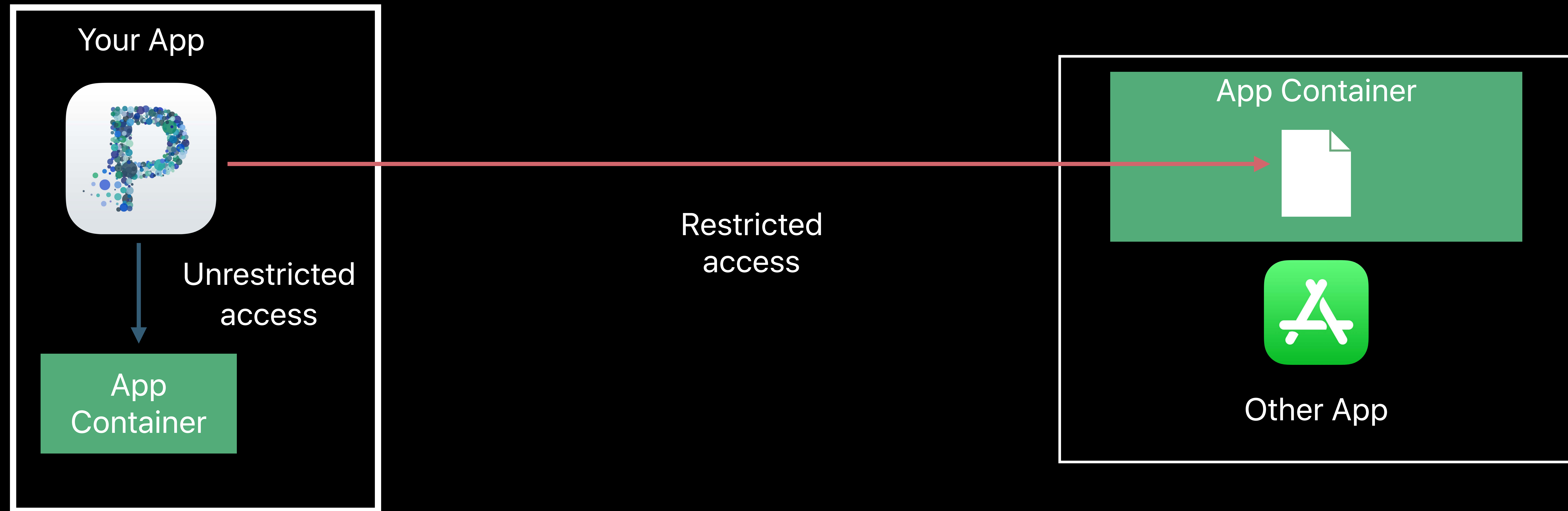
Your App and the Sandbox



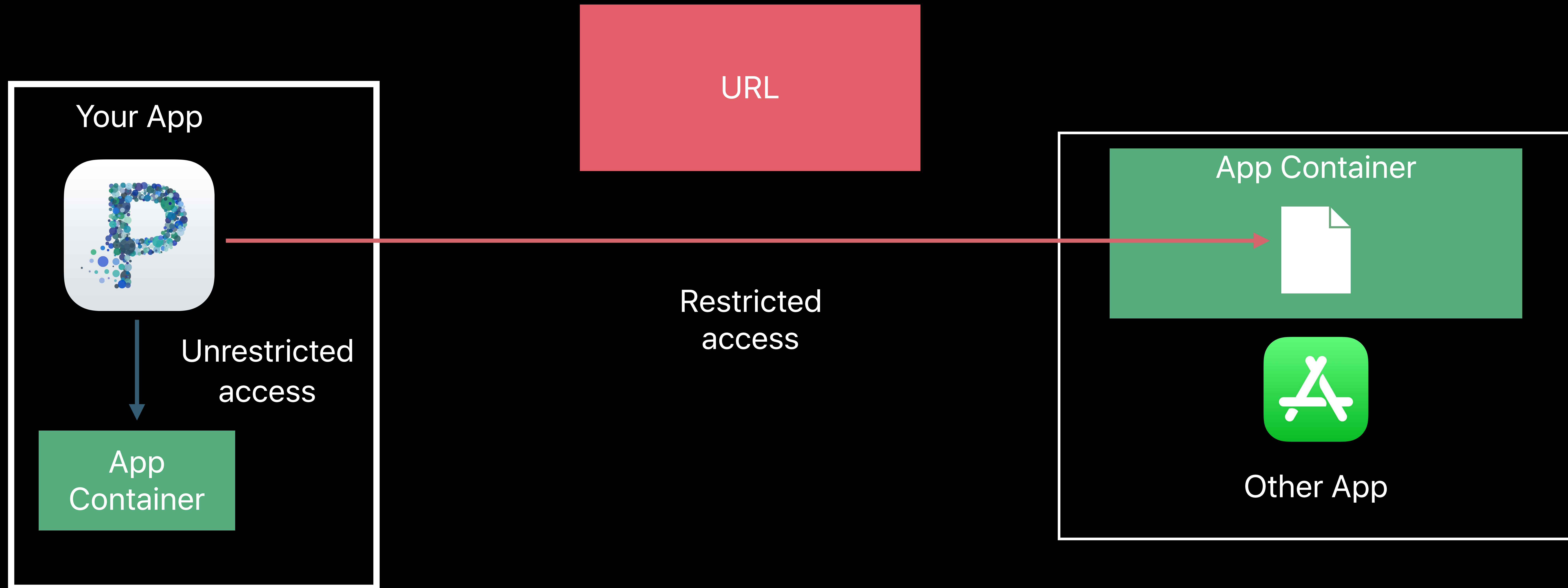
Your App and the Sandbox



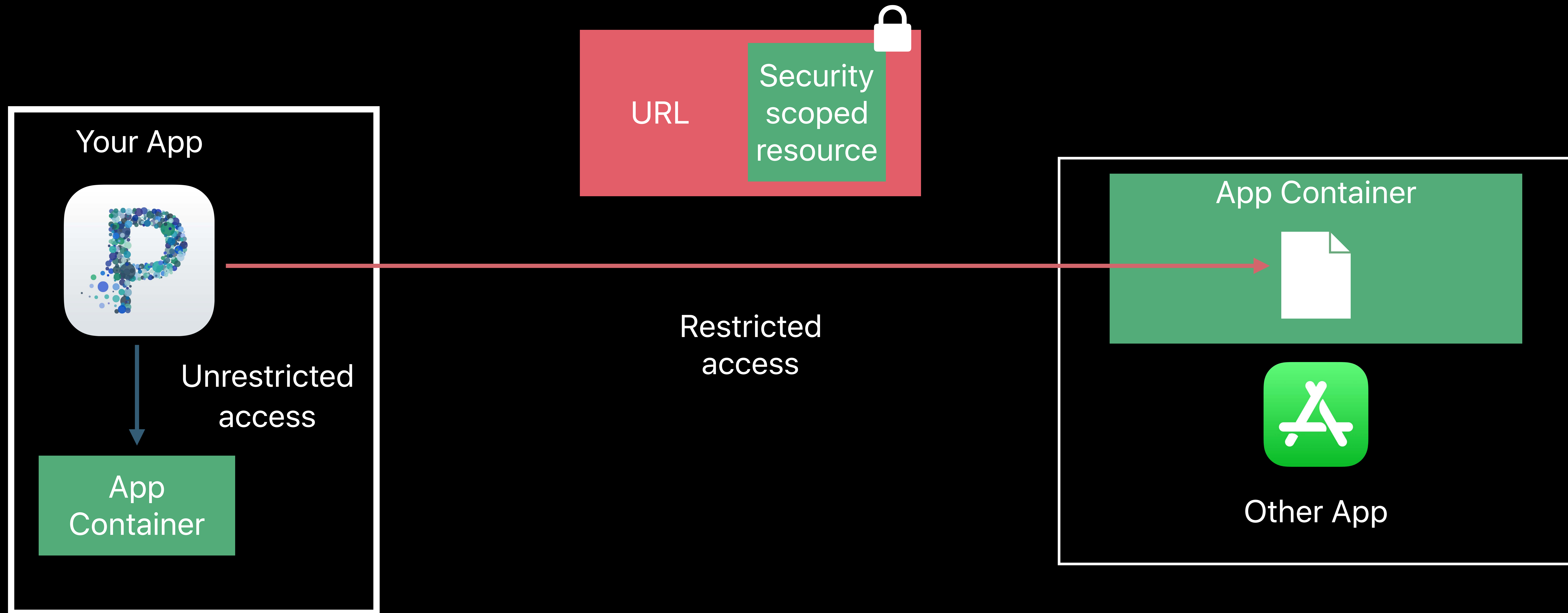
Your App and the Sandbox



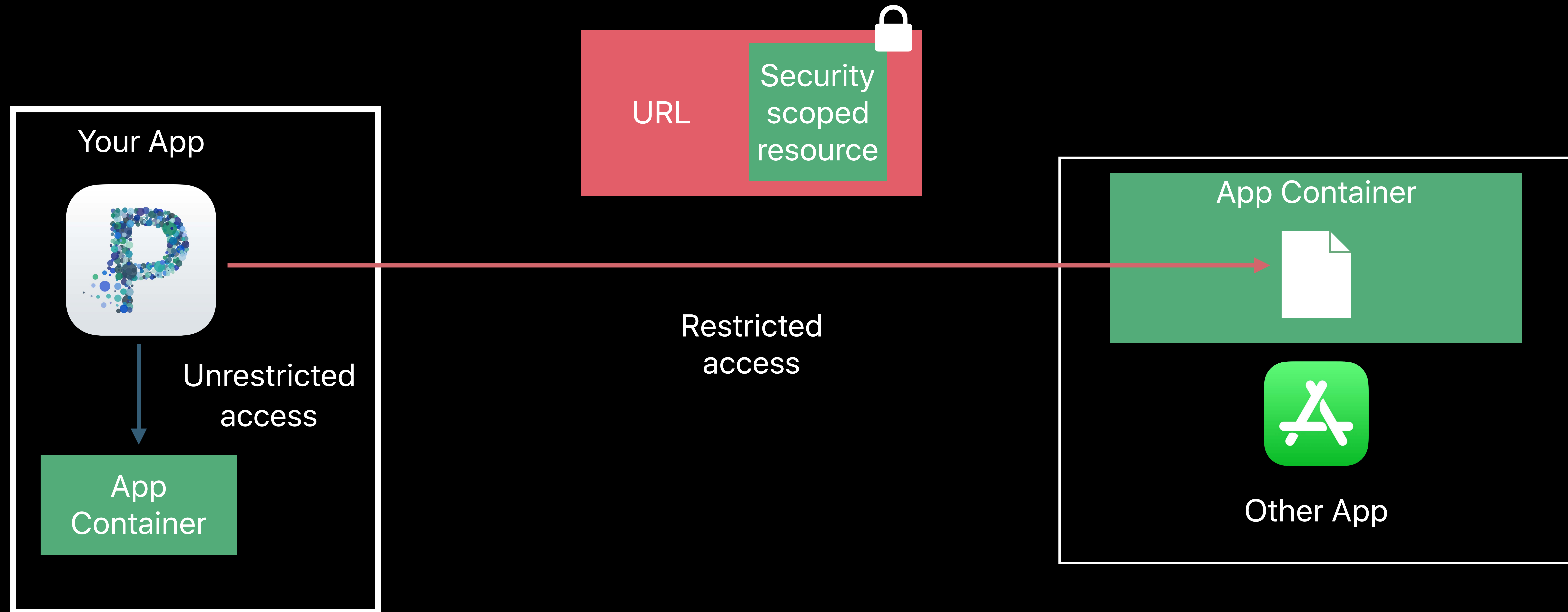
Your App and the Sandbox



Your App and the Sandbox



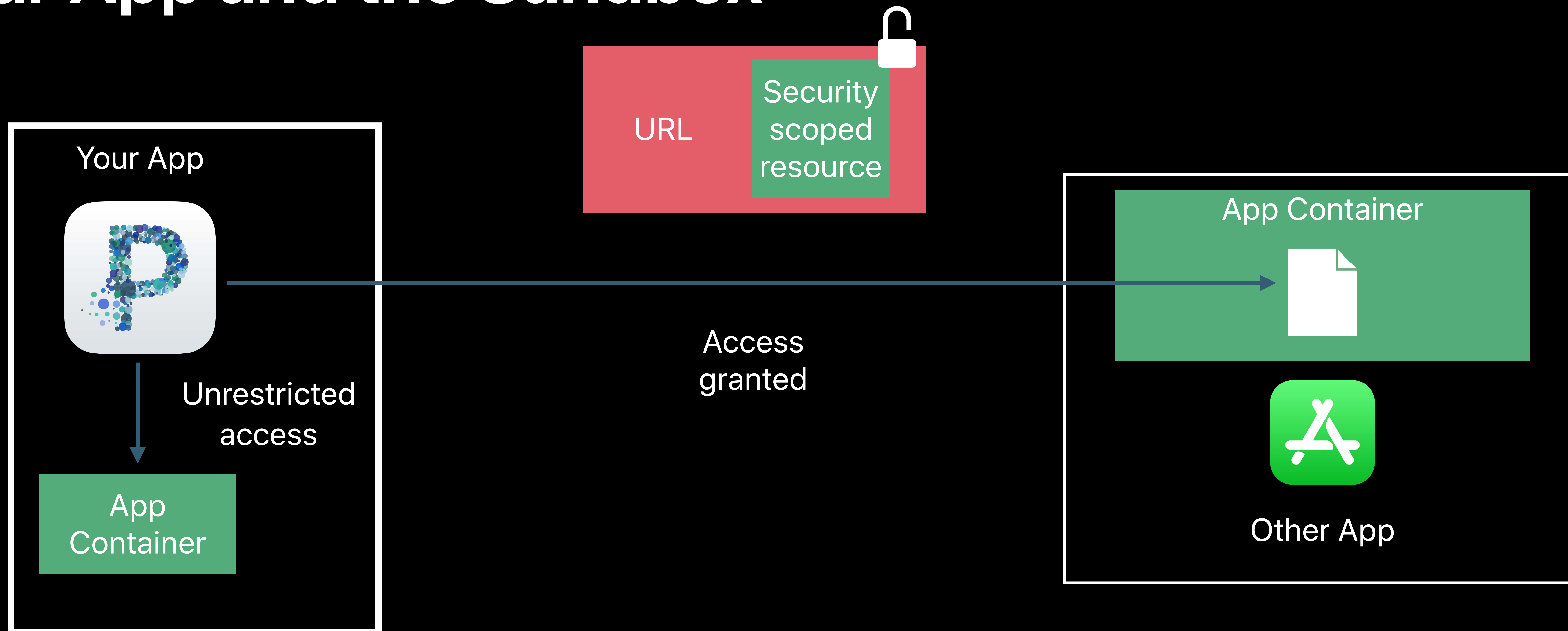
Your App and the Sandbox



```
func startAccessingSecurityScopedResource() -> Bool
```

```
func stopAccessingSecurityScopedResource()
```

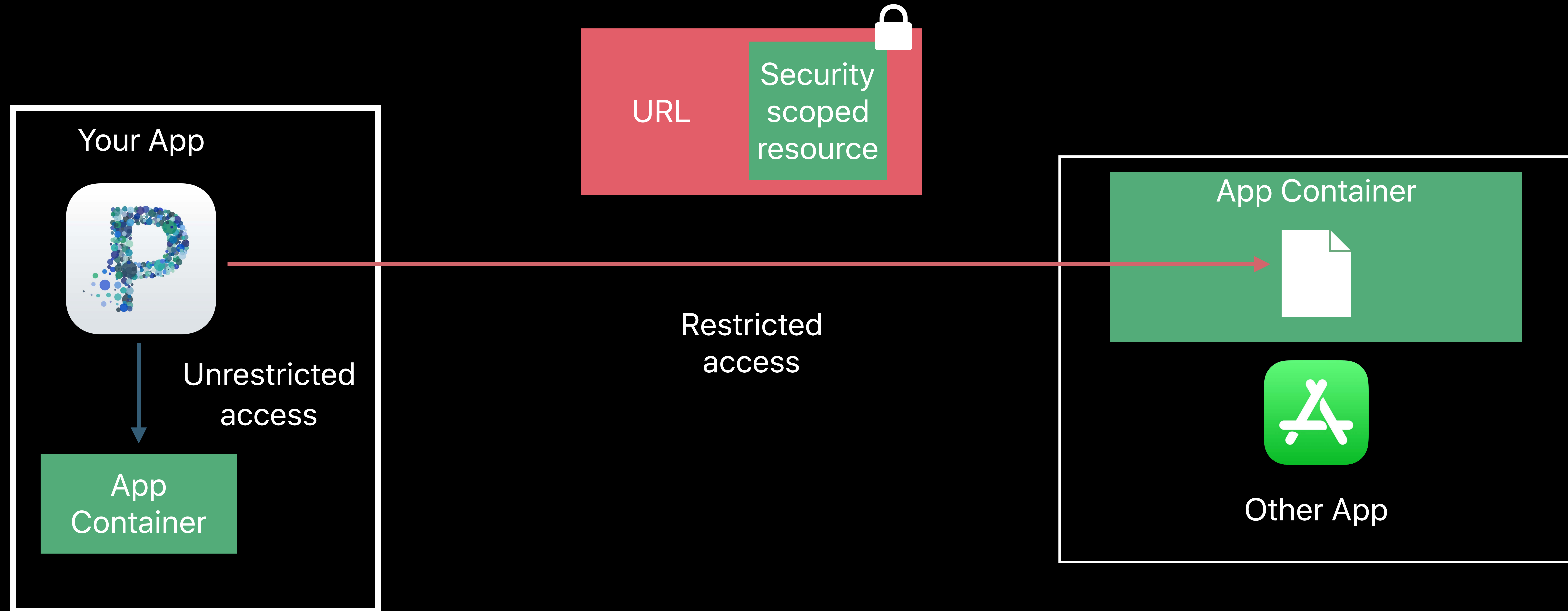
Your App and the Sandbox



```
func startAccessingSecurityScopedResource() -> Bool
```

```
func stopAccessingSecurityScopedResource()
```

Your App and the Sandbox



```
func startAccessingSecurityScopedResource() -> Bool
```

```
func stopAccessingSecurityScopedResource()
```

Your App and the Sandbox

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Balance `start/stopAccessing` calls

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Balance `start/stopAccessing` calls

Only call `stopAccessing` if `startAccessing` returns `true`

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Balance `start/stopAccessing` calls

Only call `stopAccessing` if `startAccessing` returns `true`

Keep resource access time as small as possible

Your App and the Sandbox



```
let didStartAccessing = url.startAccessingSecurityScopedResource()  
defer {  
    if didStartAccessing {  
        url.stopAccessingSecurityScopedResource()  
    }  
}  
// do something with URL
```

Balance `start/stopAccessing` calls

Only call `stopAccessing` if `startAccessing` returns `true`

Keep resource access time as small as possible

When in doubt, call these APIs

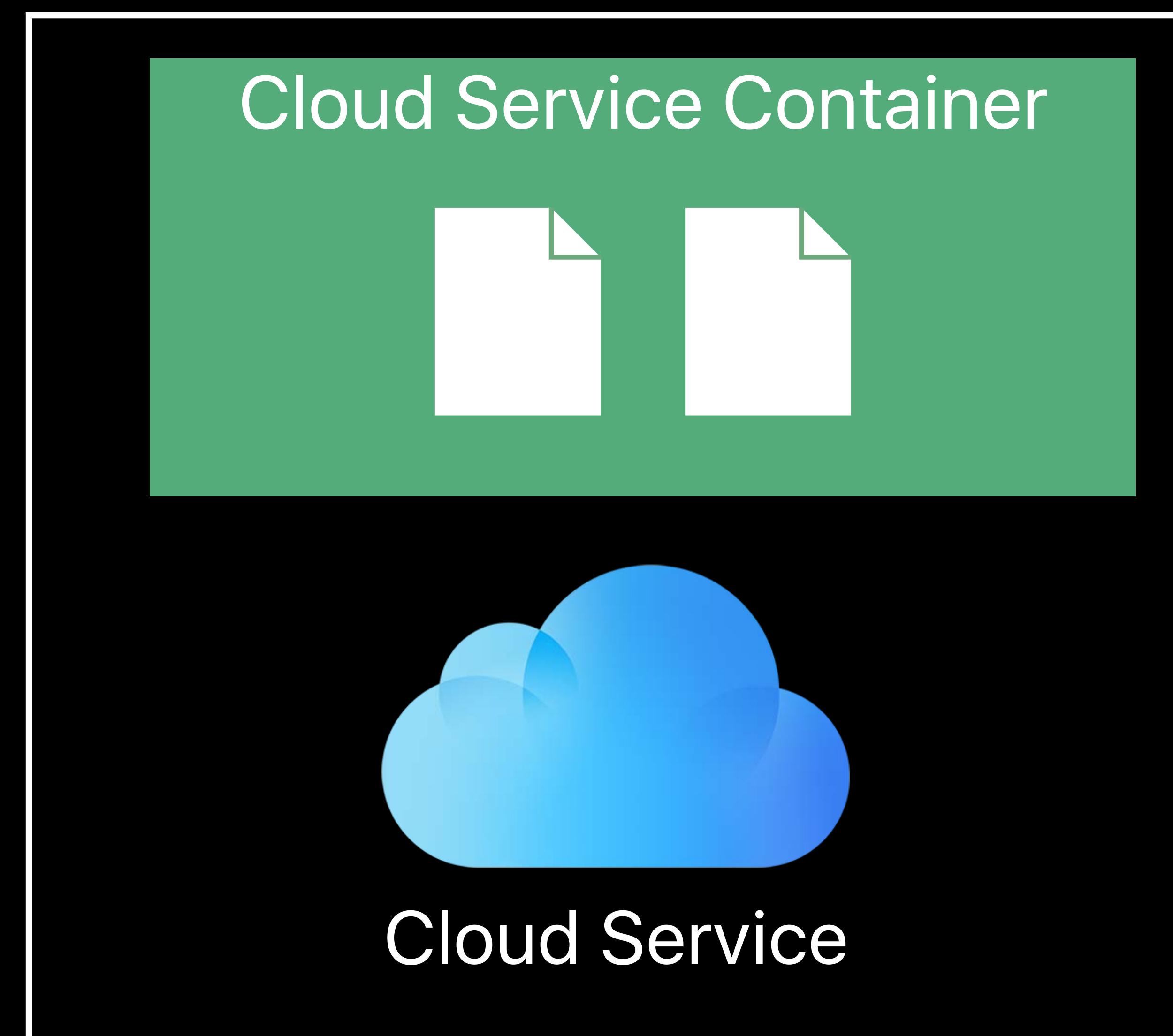
Coordinating File Access



Your App



Other App



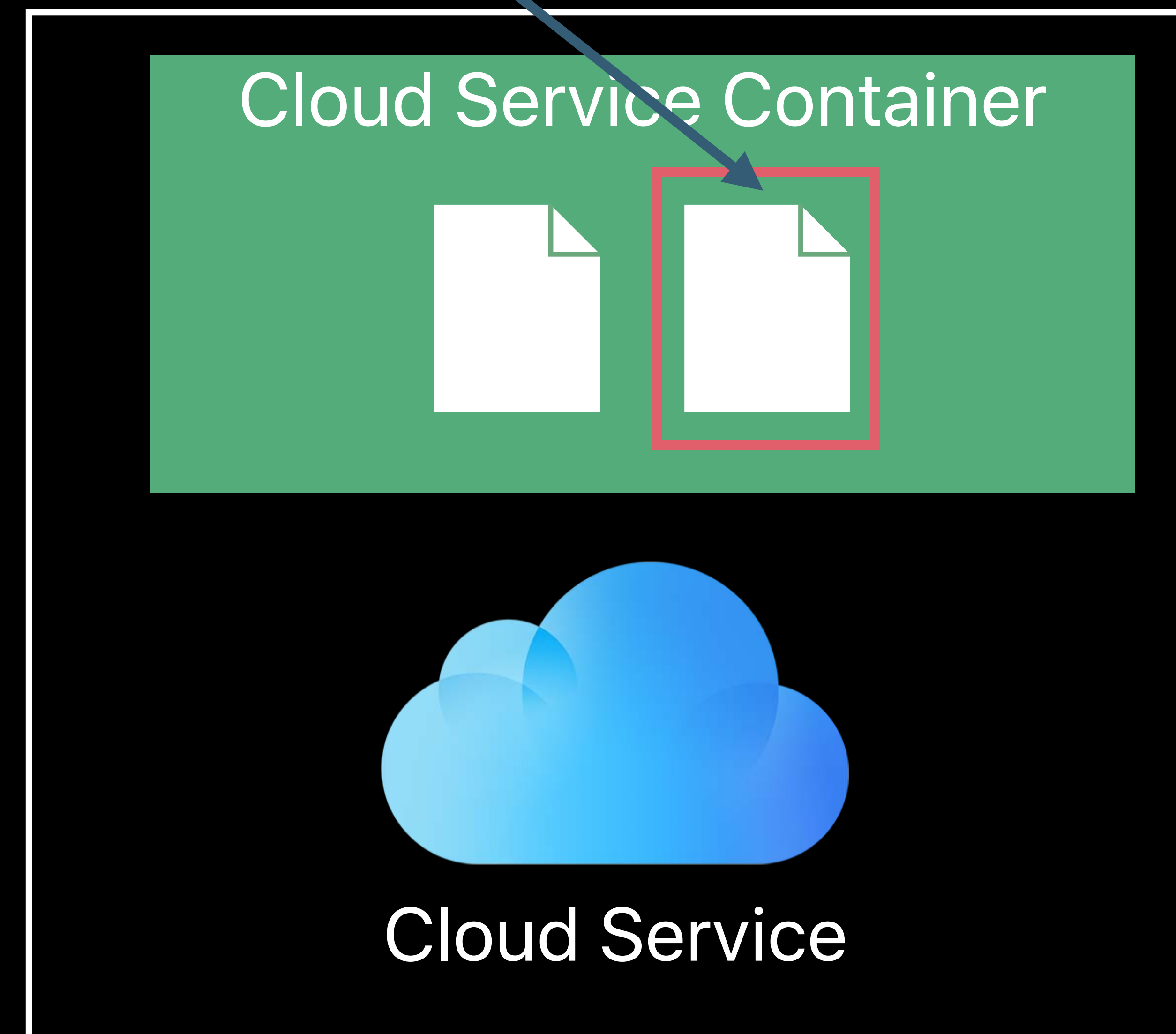
Coordinating File Access



Your App



Other App



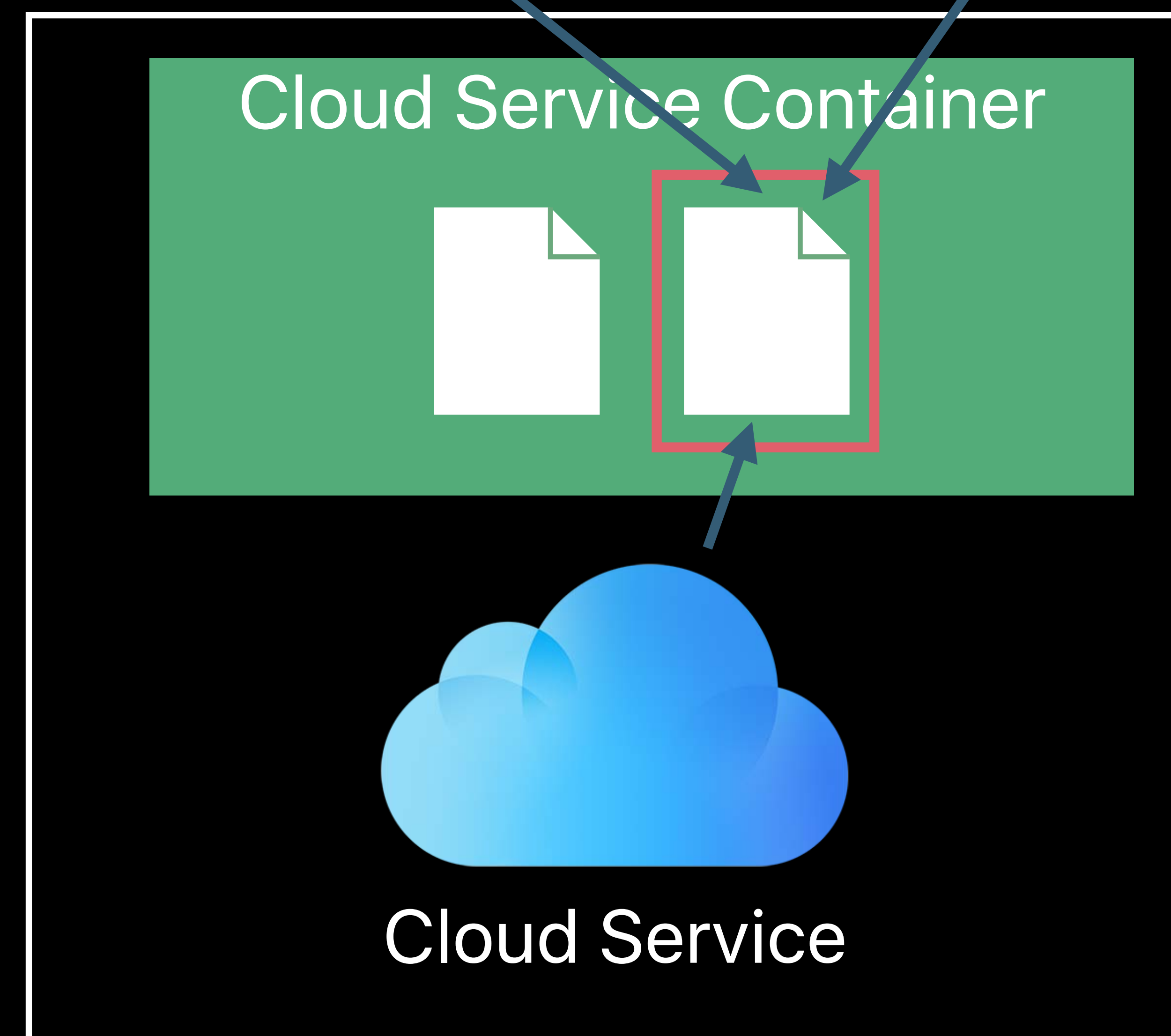
Coordinating File Access



Your App



Other App



Coordinating File Access

Coordinating File Access

File Coordination—`NSFileCoordinator` and `NSFilePresenter`

Coordinating File Access

File Coordination—`NSFileCoordinator` and `NSFilePresenter`

System-wide multiple reader/single writer lock

Coordinating File Access

File Coordination—`NSFileCoordinator` and `NSFilePresenter`

System-wide multiple reader/single writer lock

Instructs the system to download the document

Make My Life Simpler!

UIDocument

Make My Life Simpler!

UIDocument

Available since iOS 5

Make My Life Simpler!

UIDocument

Available since iOS 5

Recommended way for displaying and editing your documents

Make My Life Simpler!

UIDocument

Available since iOS 5

Recommended way for displaying and editing your documents

No need to call `start/stopAccessingSecurityScopedResource`

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UIDocument

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Recommended way for displaying and editing your documents

No need to call `start/stopAccessingSecurityScopedResource`

Handles file coordination for you

Make My Life Simpler!

UIDocument

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Handles file coordination for you

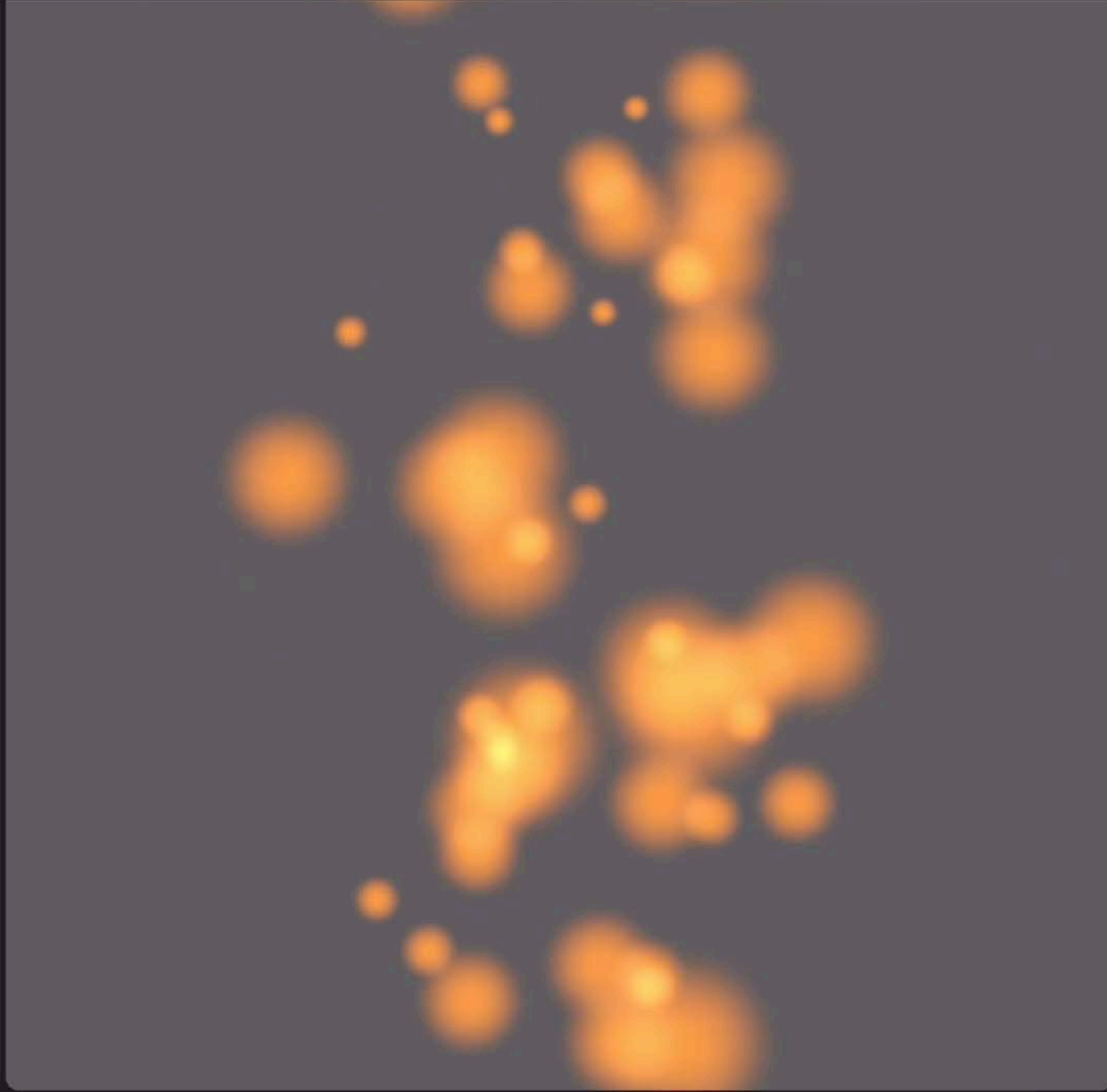
9:41 AM

100 % 

Done

Nice Particles.particles

Inspector 



Birth Rate



Lifespan



Size



Size Variation



Spreading Angle



Color

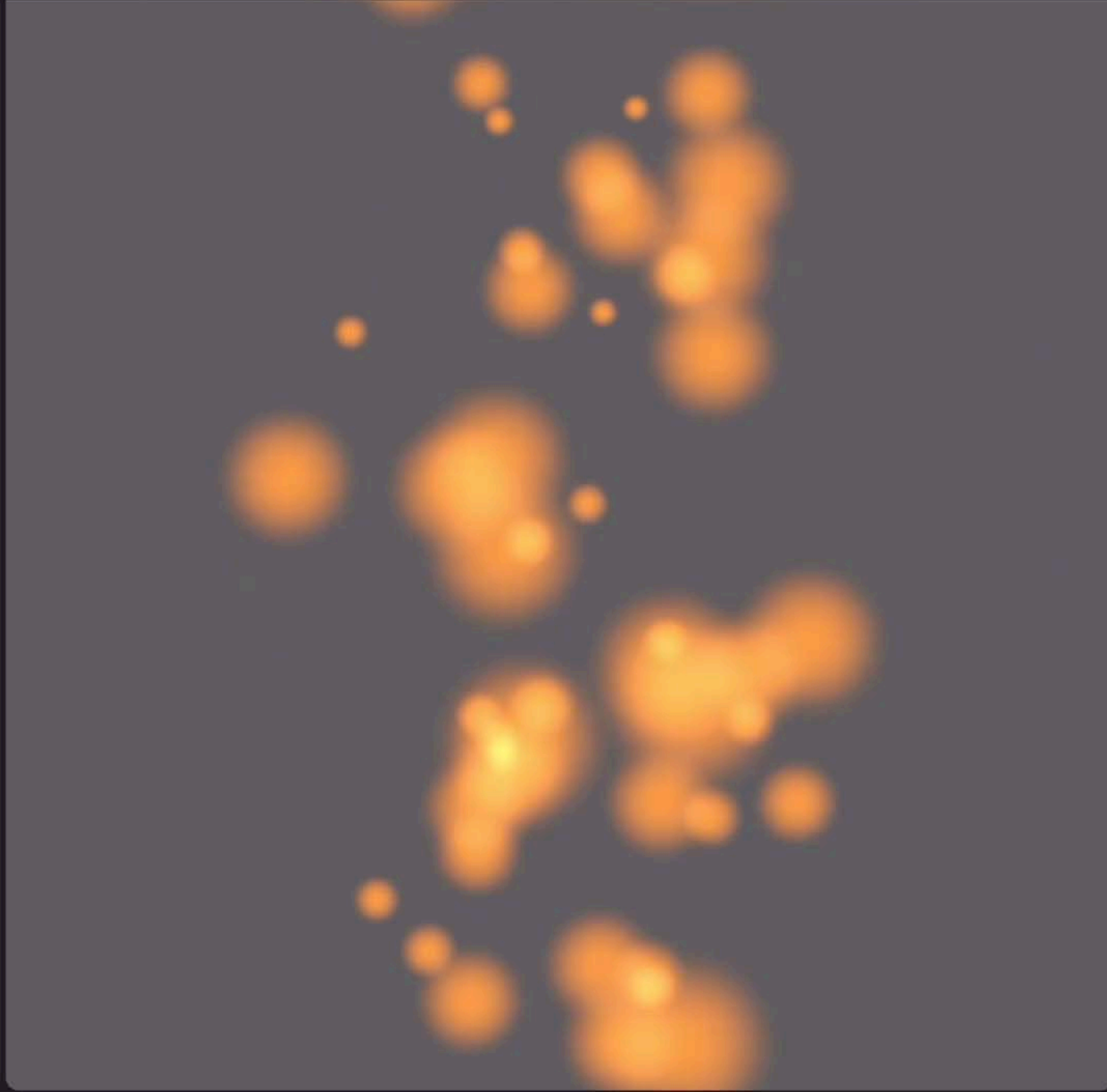


9:41 AM

100 % 

Done

Nice Particles.particles



Inspector 

Birth Rate



Lifespan



Size



Size Variation



Spreading Angle



Color



Your App



Your App



Your App



Foreground

Background

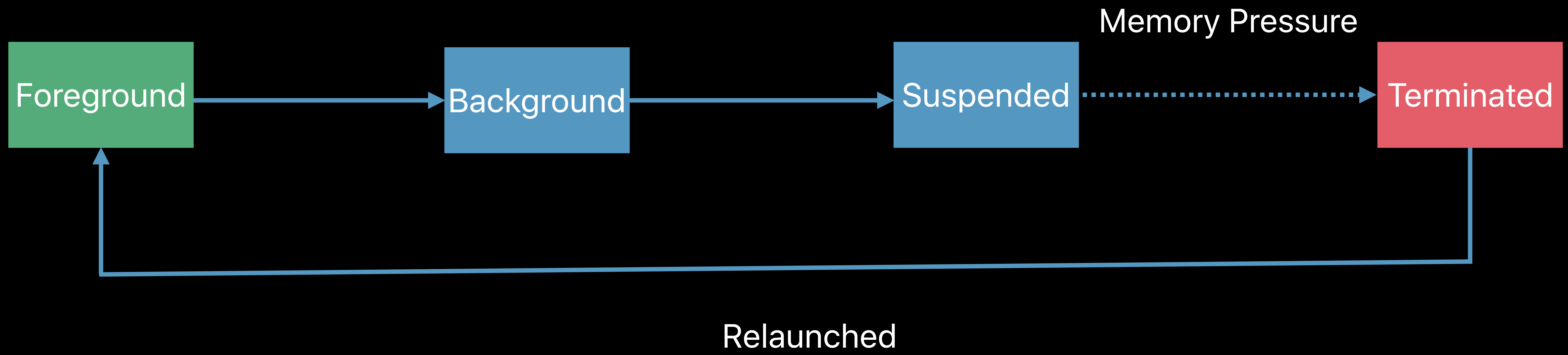
Suspended



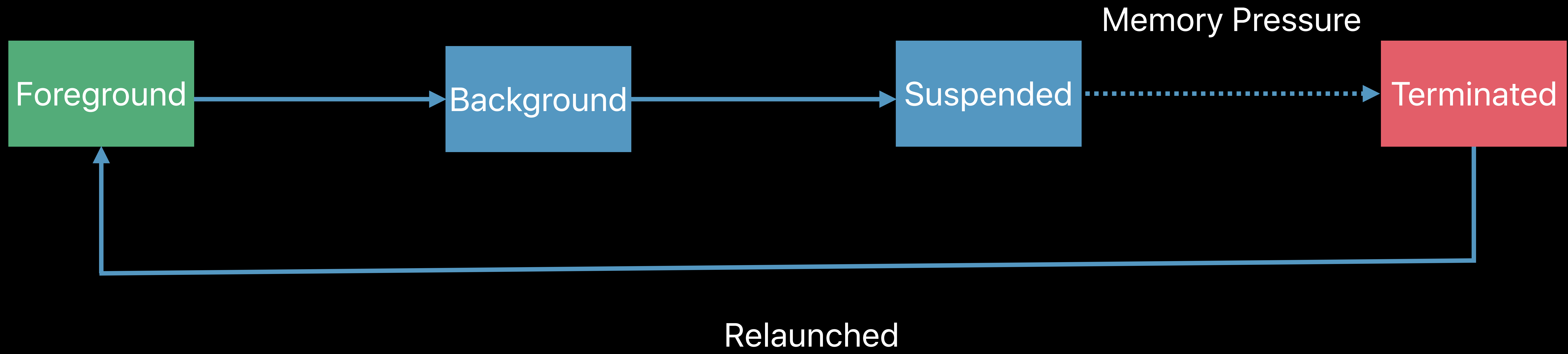
Your App



Your App



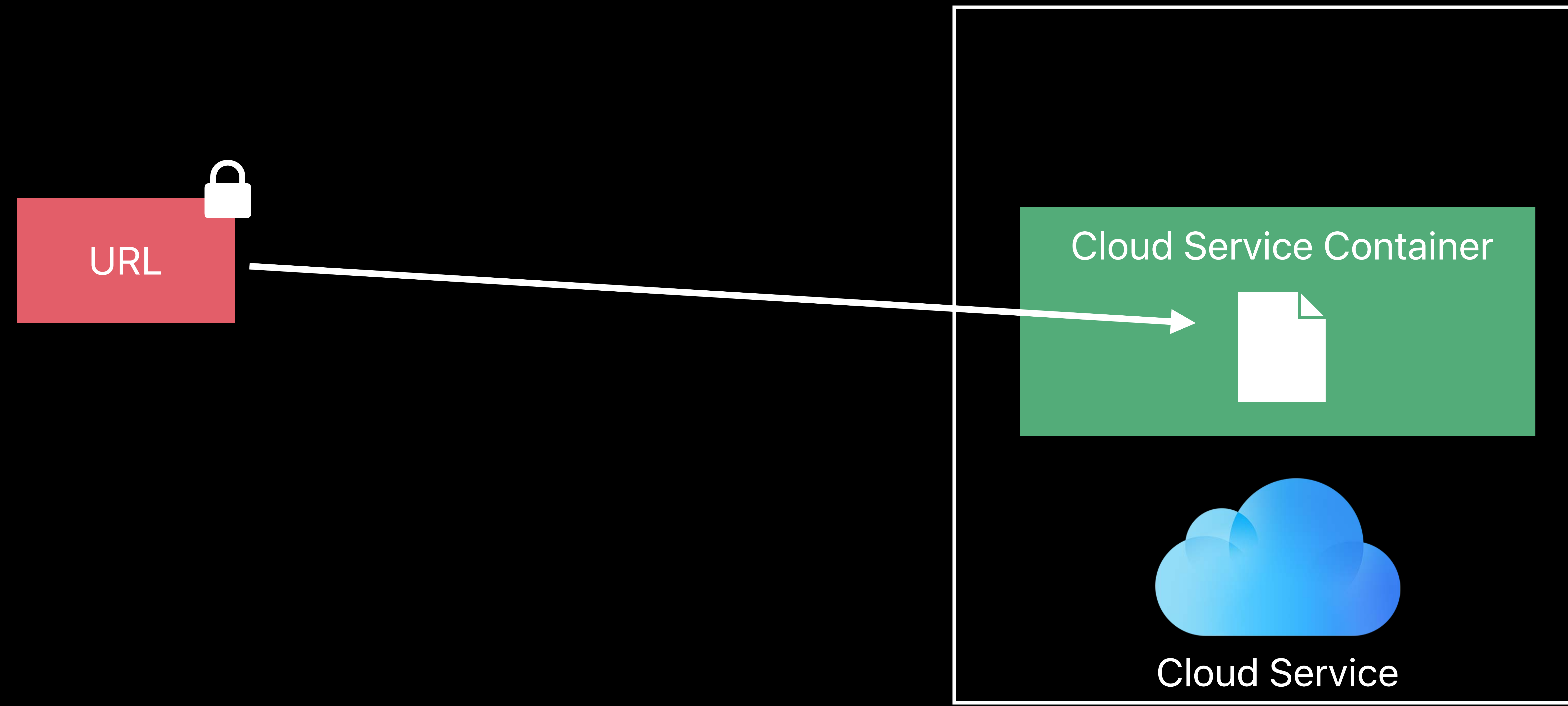
Your App



Restore the UI State

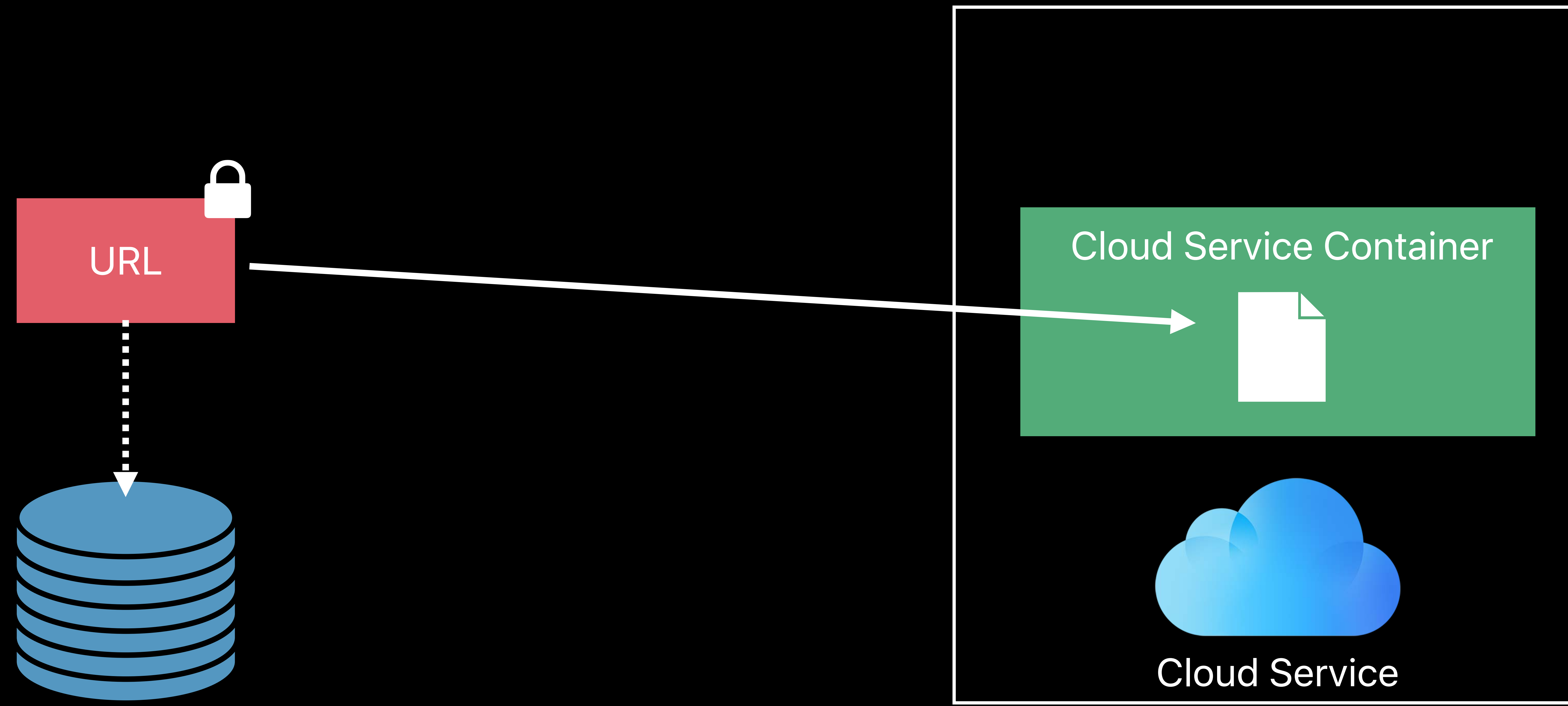
State Restoration

How do we implement it?



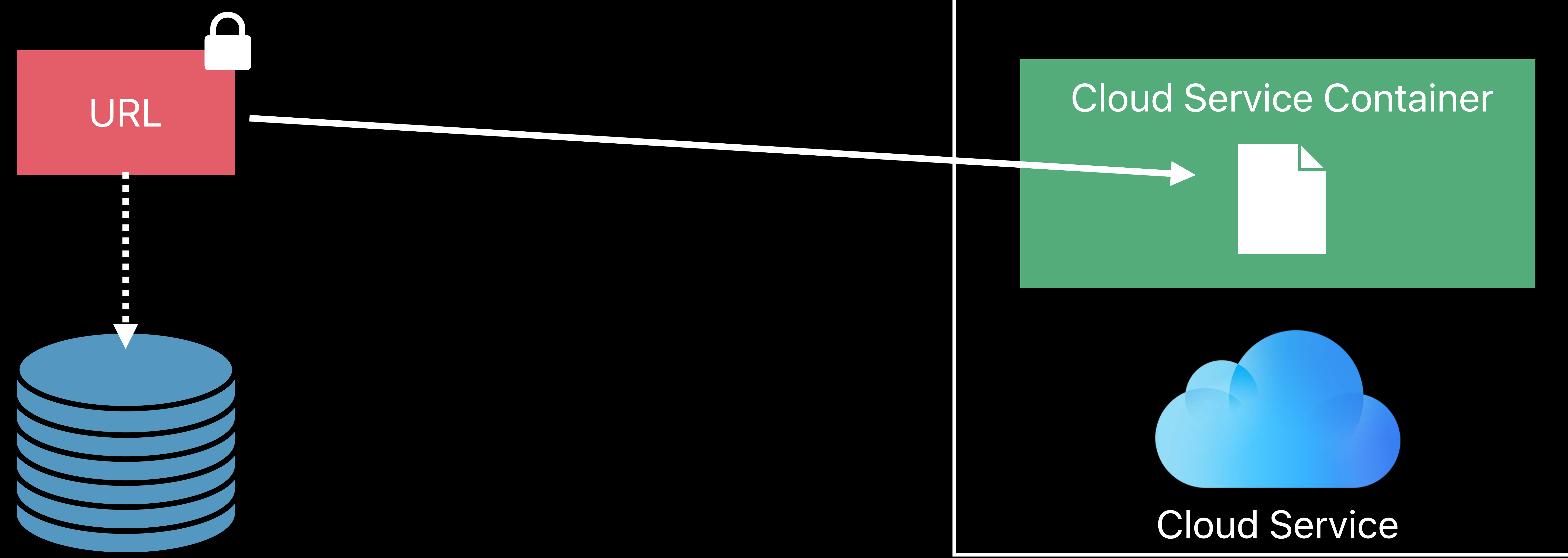
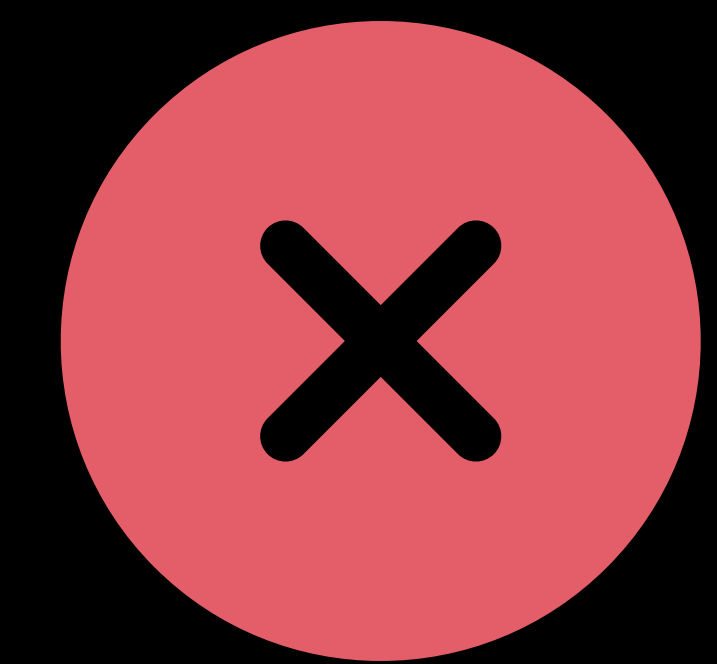
State Restoration

How do we implement it?



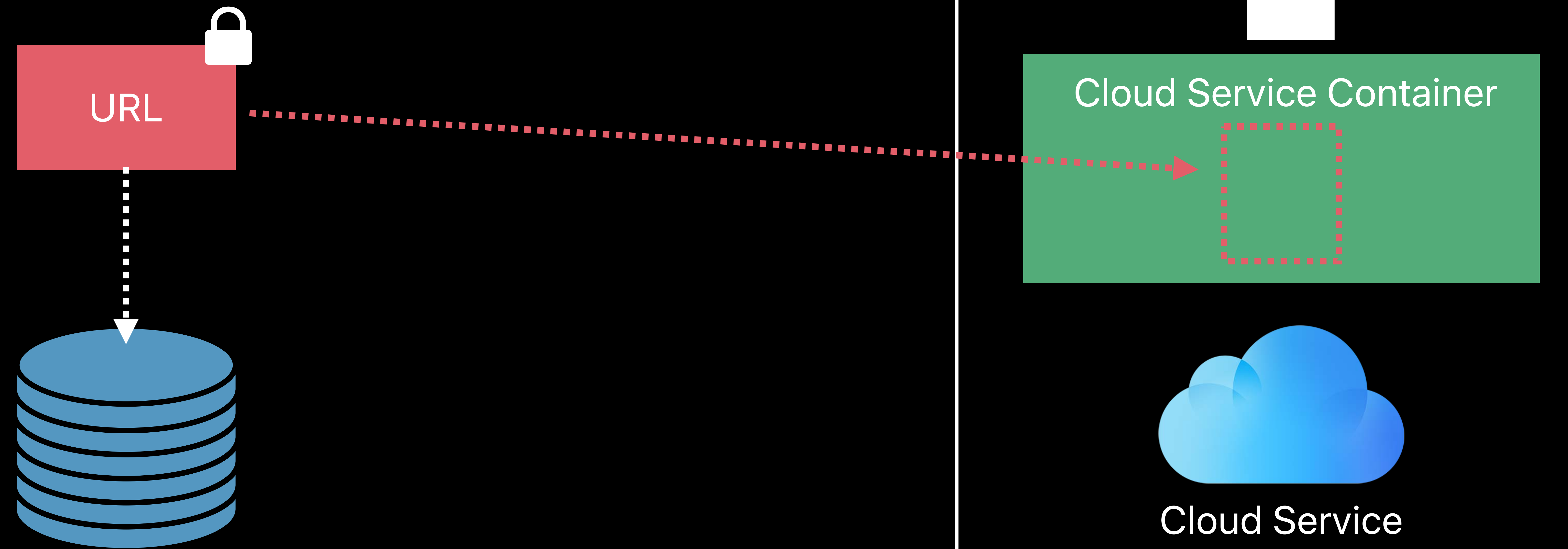
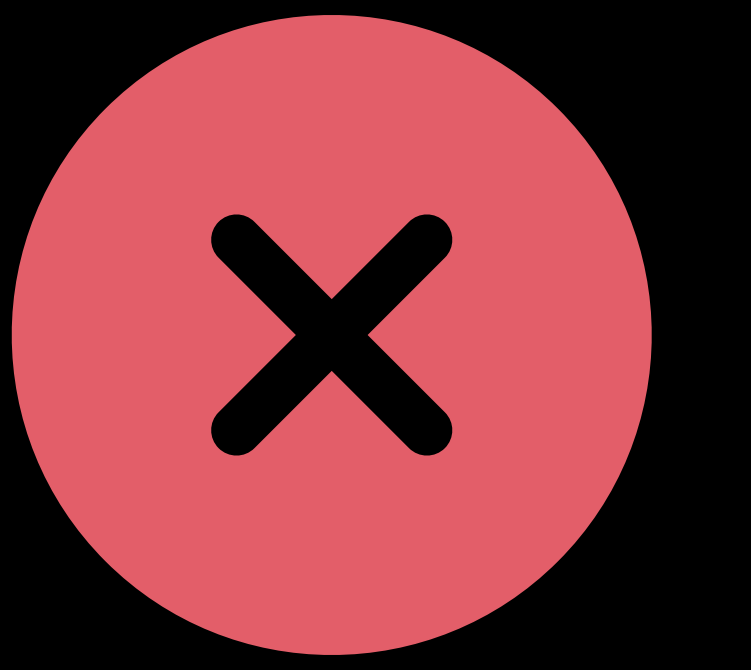
State Restoration

How do we implement it?



State Restoration

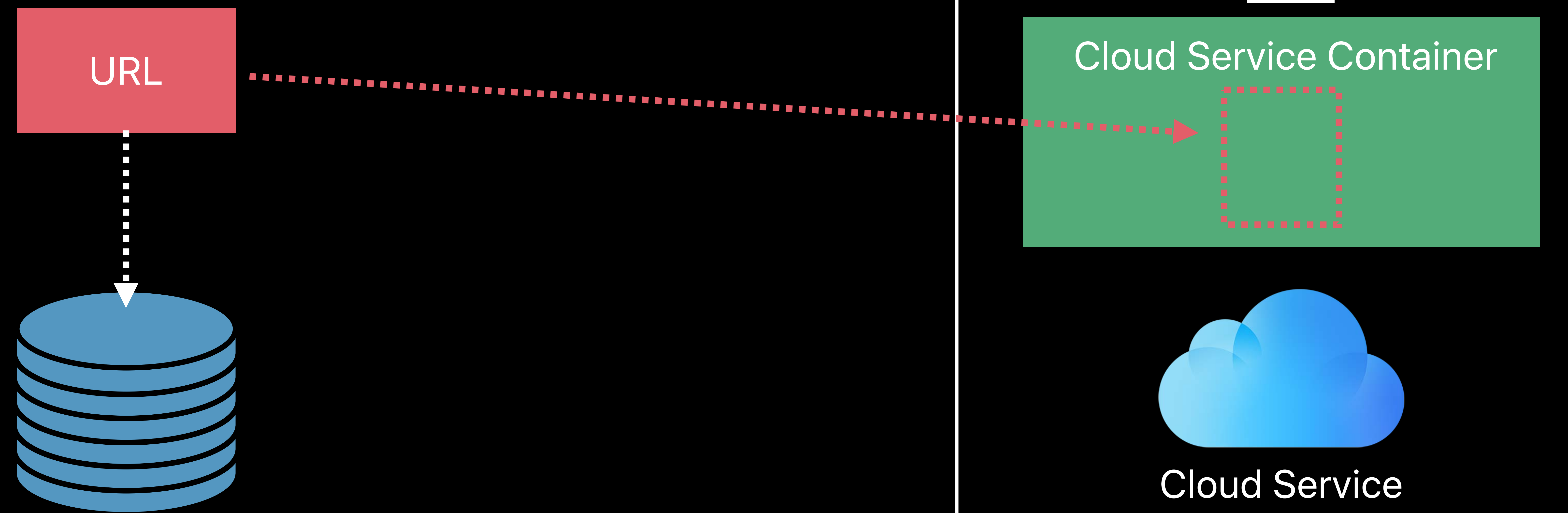
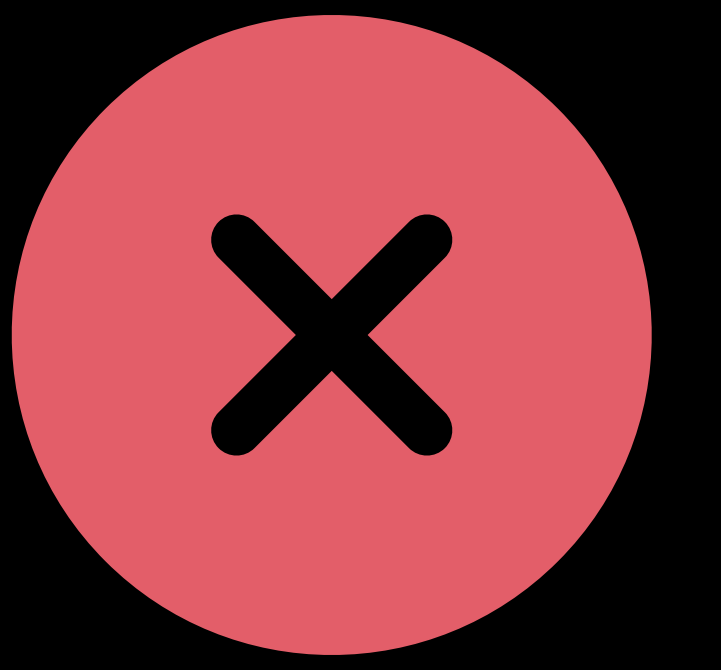
How do we implement it?



Document could have been moved or renamed

State Restoration

How do we implement it?

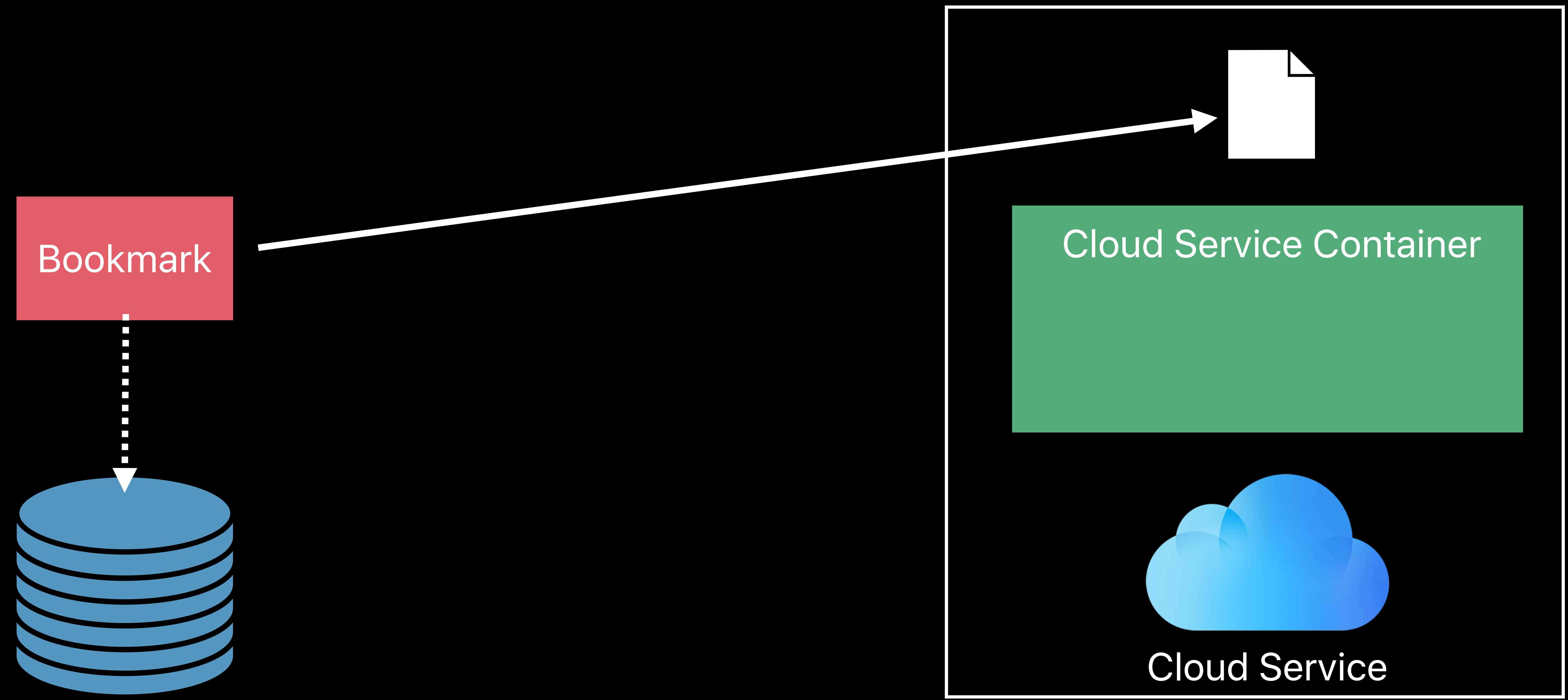


Document could have been moved or renamed

URL loses security scope when encoded

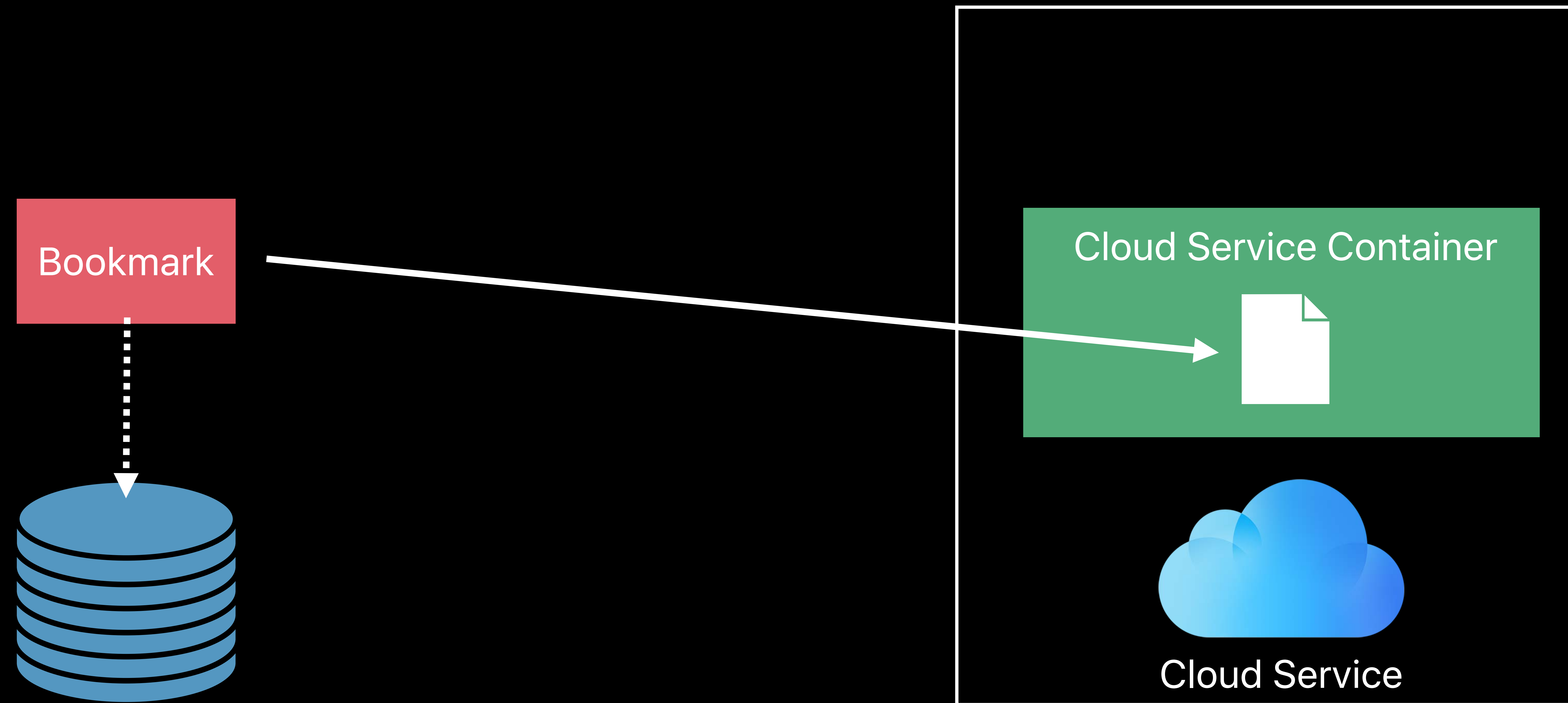
State Restoration

How do we implement it?



State Restoration

How do we implement it?



State Restoration

How do we implement it?

```
// Save security scoped bookmark
let bookmarkData = try? url.bookmarkData()

// Restore security scoped bookmark
var bookmarkDataIsStale = false
let documentURL = try? URL(resolvingBookmarkData: bookmarkData,
                           bookmarkDataIsStale: &bookmarkDataIsStale)
```

State Restoration

How do we implement it?

```
// Save security scoped bookmark
let bookmarkData = try? url.bookmarkData()

// Restore security scoped bookmark
var bookmarkDataIsStale = false
let documentURL = try? URL(resolvingBookmarkData: bookmarkData,
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```

State Restoration

How do we implement it?

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// Restore security scoped bookmark
var bookmarkDataIsStale = false
let documentURL = try? URL(resolvingBookmarkData: bookmarkData,
                           bookmarkDataIsStale: &bookmarkDataIsStale)
```

Demo

9:41



Recents

Search

See All



Beautiful Particles

iCloud Drive

+Tag



AirDrop. Tap to turn on Wi-Fi and Bluetooth to share with AirDrop.



Mail



Add to Notes



Copy to Particles



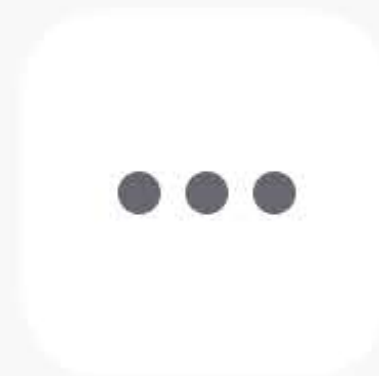
More



Add People

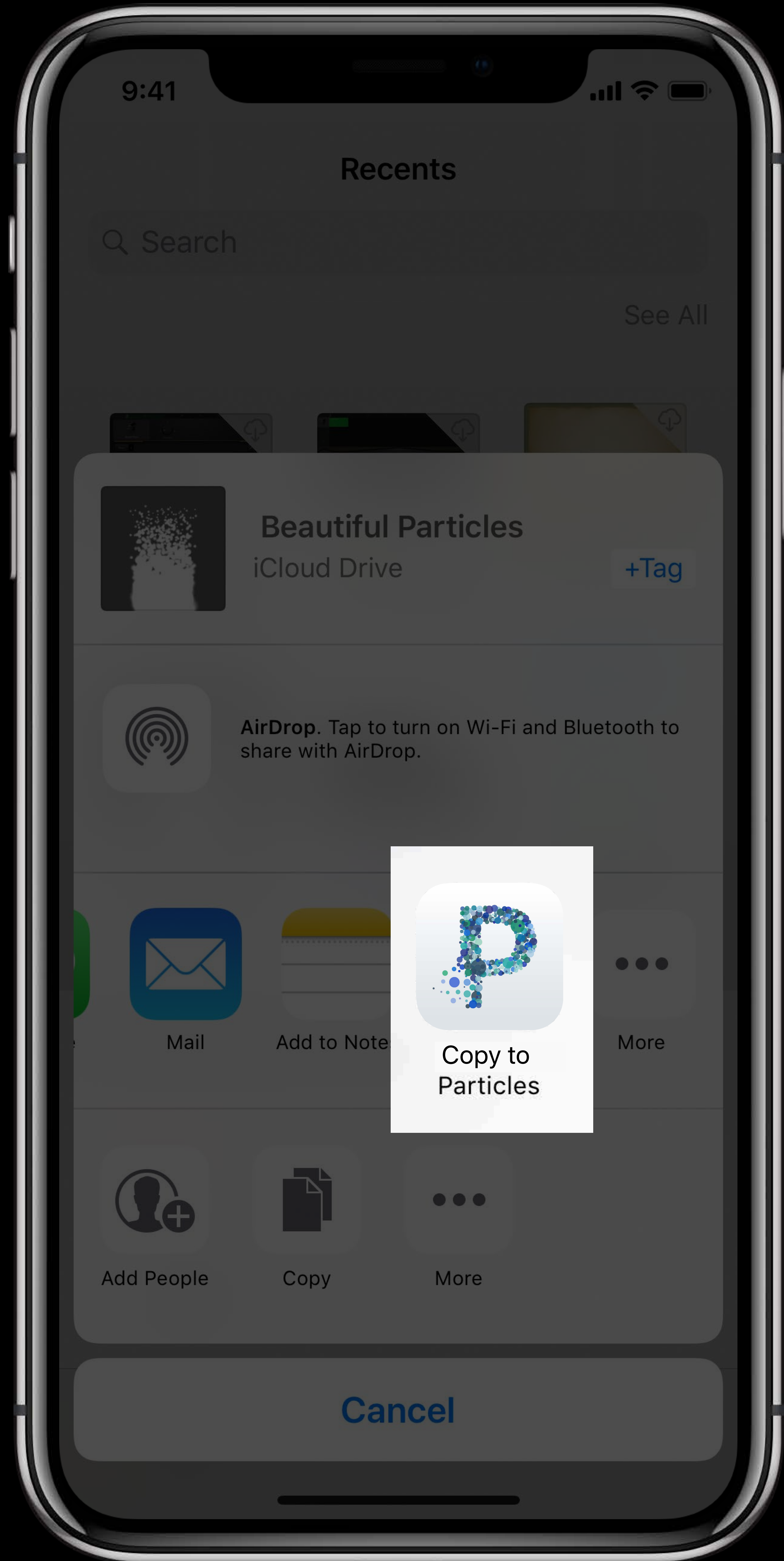


Copy



More

Cancel



9:41



Recents

Search

See All



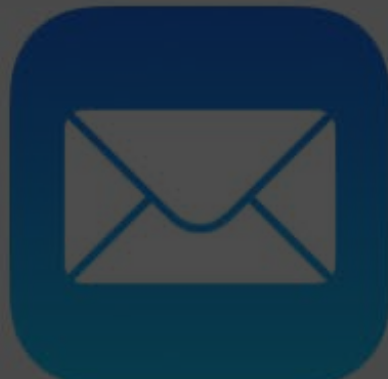
Beautiful Particles

iCloud Drive

+Tag



AirDrop. Tap to turn on Wi-Fi and Bluetooth to share with AirDrop.



Mail



Add to Note



Copy to Particles



More



Add People



Copy



More

Cancel

9:41



Recents

Search

See All



Beautiful Particles

iCloud Drive

+Tag



AirDrop. Tap to turn on Wi-Fi and Bluetooth to share with AirDrop.



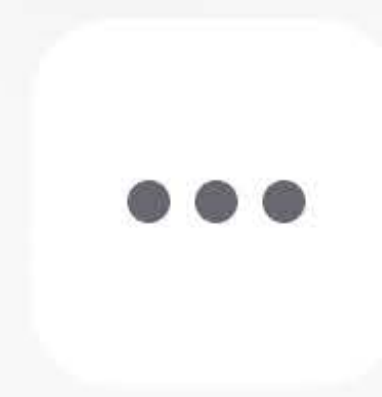
Mail



Add to Notes



Open in Particles



More



Add People

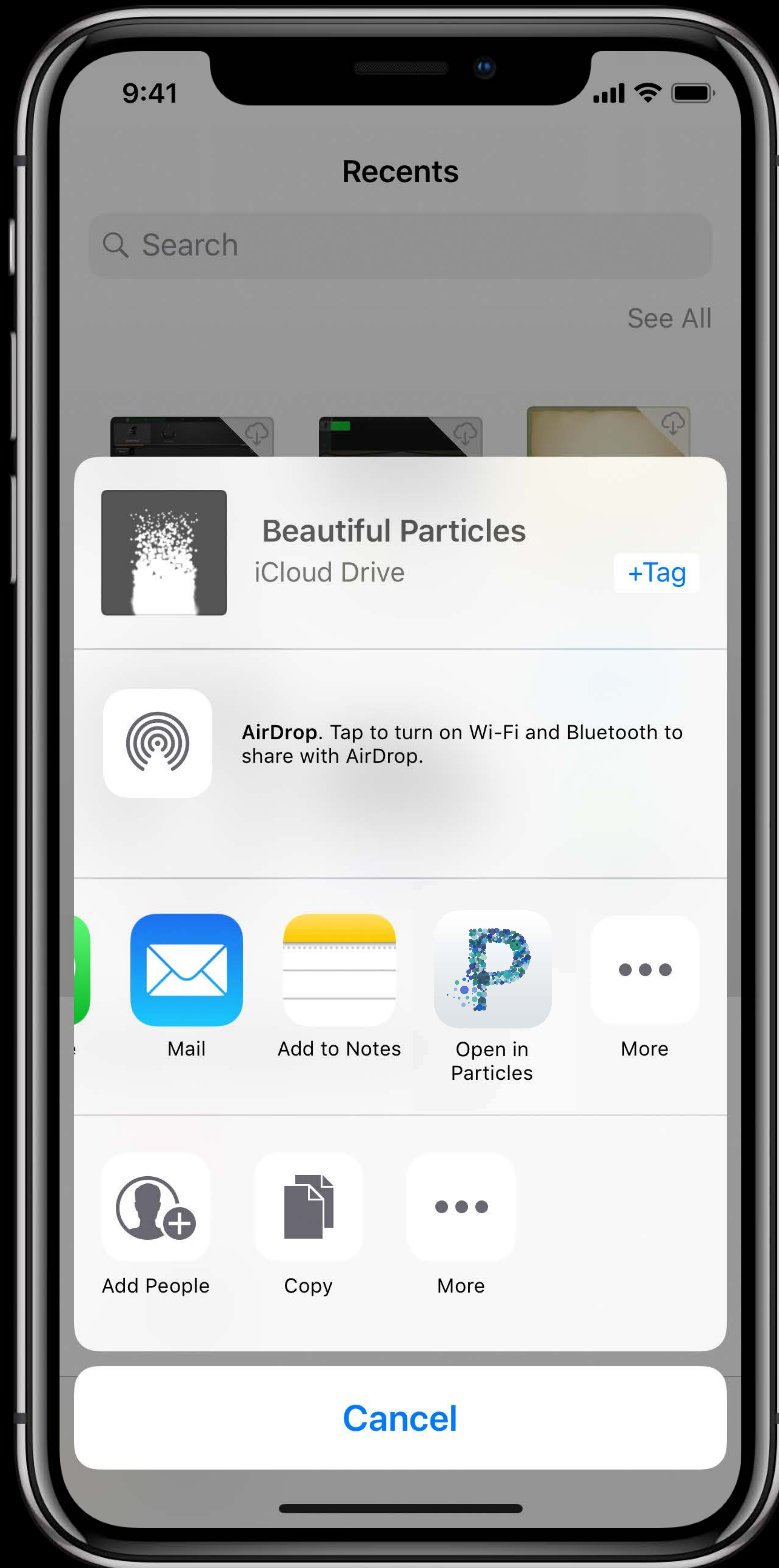


Copy

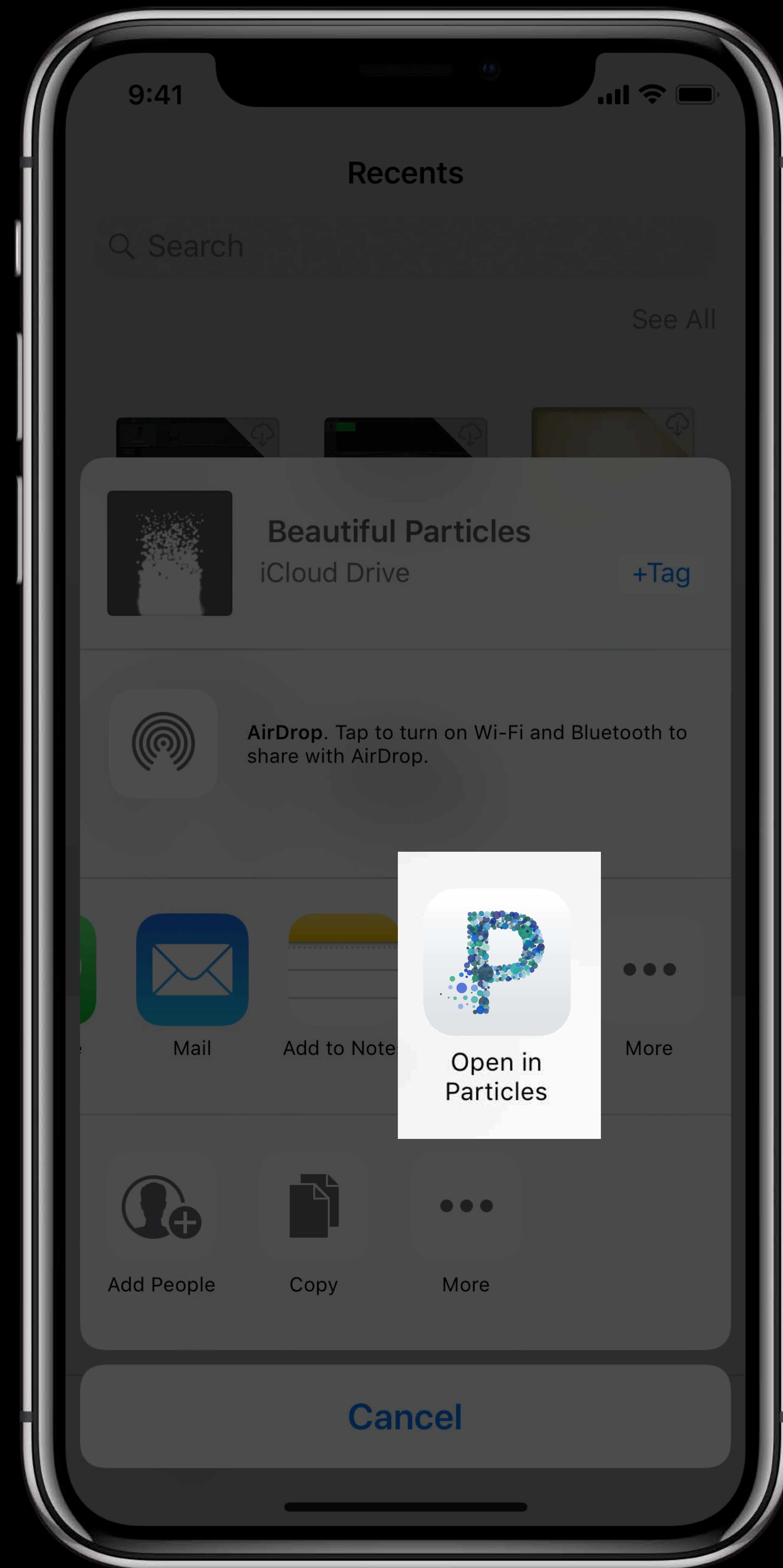


More

Cancel



Open in place



Open in place

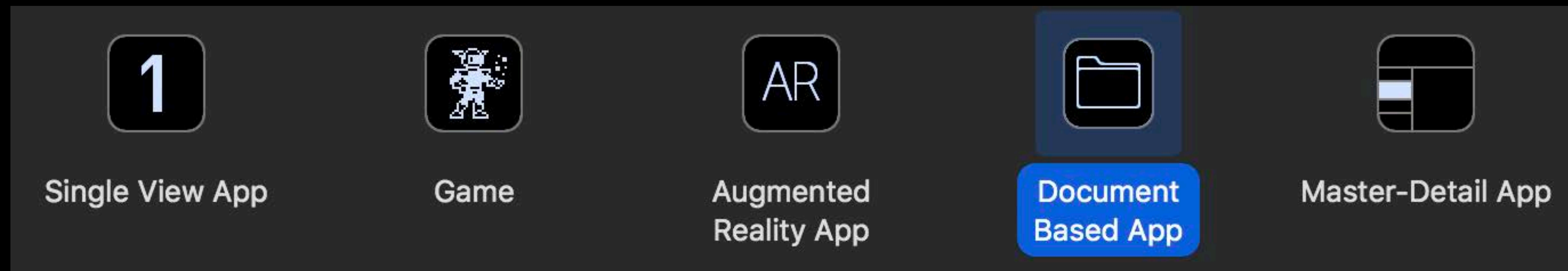
Open In Place

Adoption

Open In Place

Adoption

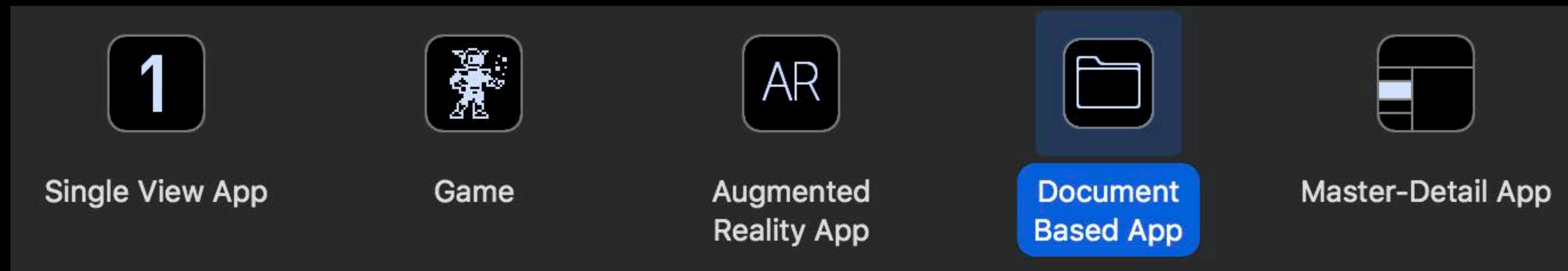
Already enabled in "Document Based App" template



Open In Place

Adoption

Already enabled in "Document Based App" template



Add `LSupportsOpeningDocumentsInPlace` key to Info.plist

Supports opening documents in place	⌵	Boolean	YES
▶ Exported Type UTIs	⌵	Array	(1 item)
▶ Imported Type UTIs	⌵	Array	(1 item)

Open In Place

Adoption

Open In Place

Adoption

```
func application(_ app: UIApplication, open inputURL: URL,  
                options: [UIApplicationOpenURLOptionsKey : Any] = [:]) -> Bool
```

Open In Place

Adoption

```
func application(_ app: UIApplication, open inputURL: URL,  
                options: [UIApplicationOpenURLOptionsKey : Any] = [:]) -> Bool
```

Document Browser based apps

```
func revealDocument(at url: URL, importIfNeeded: Bool,  
                   completion: ((URL?, Error?) -> Void)? = nil)
```

```
// Present the document in the completion handler
```

9:41



Cancel

Visual Report

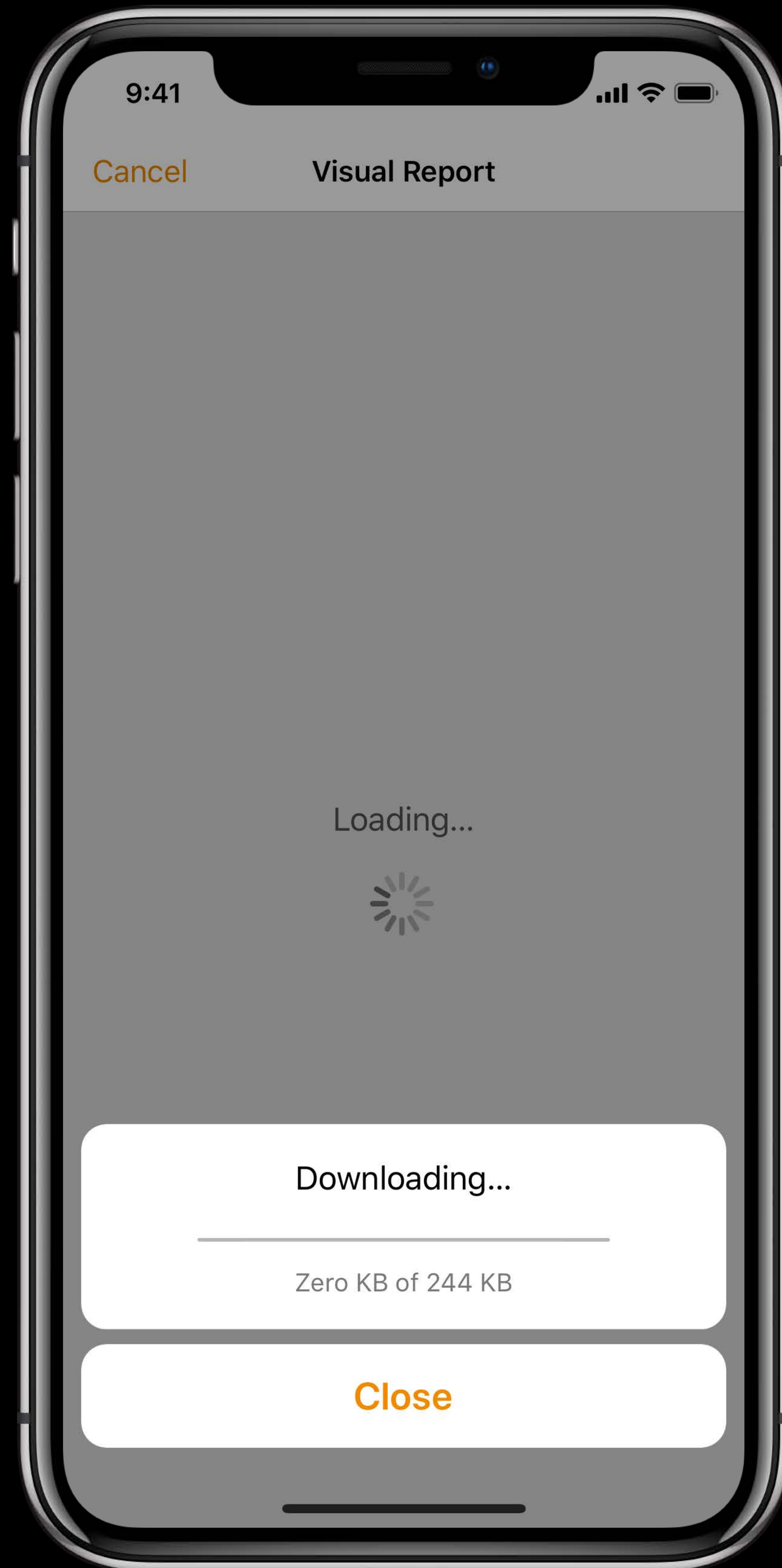
Loading...



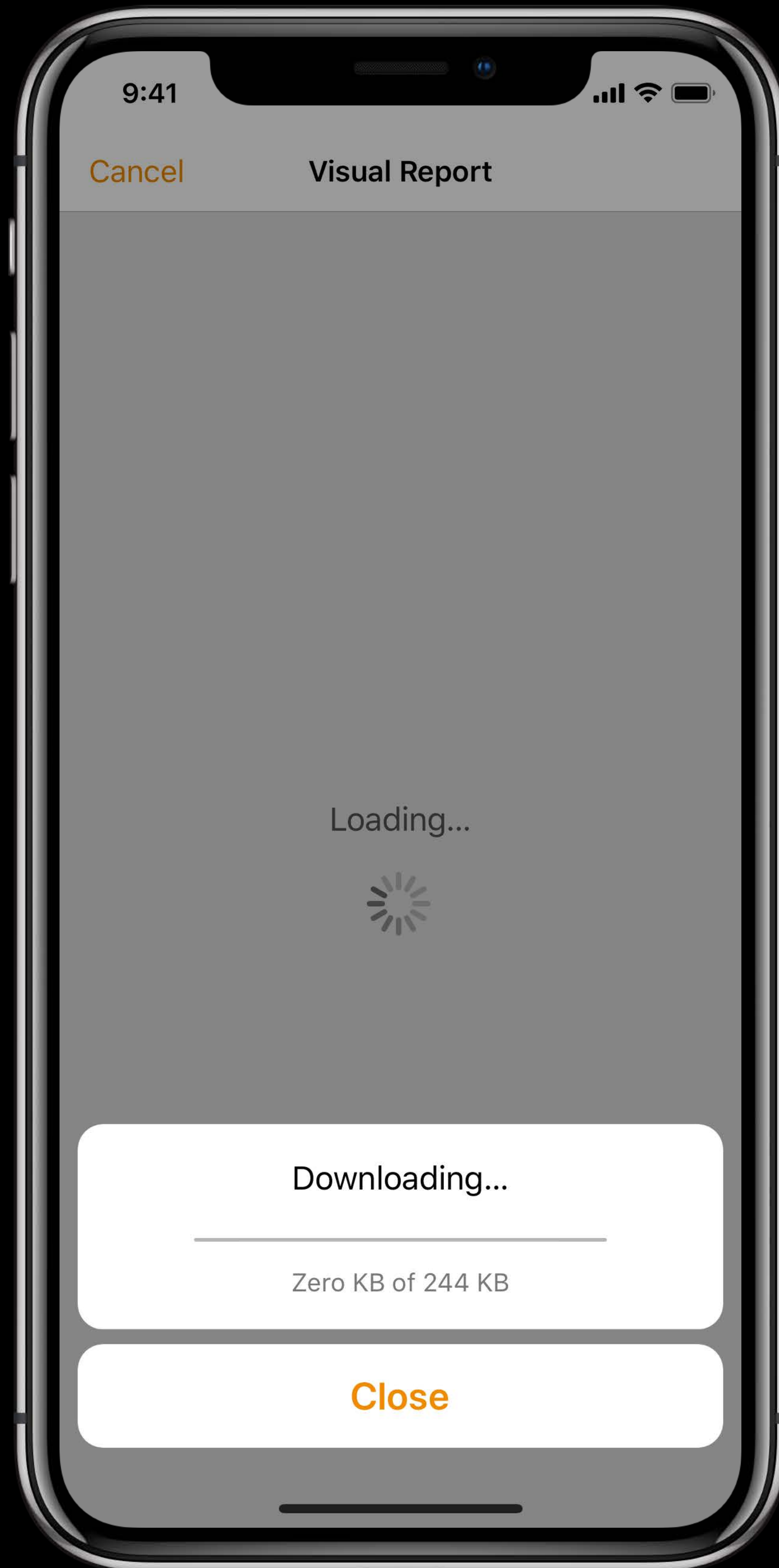
Downloading...

Zero KB of 244 KB

Close



Progress reporting



Progress reporting

Support cancellation

Open In Place

Progress reporting

Open In Place

Progress reporting

Free when you call `revealDocument` on `UIDocumentBrowserViewController`

Open In Place

Progress reporting

Free when you call `revealDocument` on `UIDocumentBrowserViewController`

UIDocument conforms to `ProgressReporting`

```
extension UIDocument: ProgressReporting {  
    var progress: Progress? { get }  
}
```


Open In Place

Progress reporting

Free when you call `revealDocument` on `UIDocumentBrowserViewController`

UIDocument conforms to `ProgressReporting`

```
extension UIDocument: ProgressReporting {  
    var progress: Progress? { get }  
}
```

Ship it!

Raising the Bar

Raising the Bar

Adopt UIDocument

Raising the Bar

Adopt UIDocument

Adopt `start/stopAccessing` best practices

Raising the Bar

Adopt UIDocument

Adopt `start/stopAccessing` best practices

Coordinate file access

Raising the Bar

Adopt UIDocument

Adopt `start/stopAccessing` best practices

Coordinate file access

Implement state restoration

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Implement state restoration

Implement Open In Place and report progress

Summary

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- Document browser and document picker

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- Siri Shortcuts

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- Document browser and document picker
- Raising the bar
- Siri Shortcuts
- FileProvider and FileProviderUI

More Information

<https://developer.apple.com/wwdc18/216>

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