Best Practices for Building Apps Used in Business and Education

Session 304

David M. O'Rourke iOS Managed Configuration Team

Agenda

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Modern App Design Practices

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Architecture Overview of Shared iPad

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Cover What iOS Technologies to Adopt for Shared iPad

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New Opportunities to Enhance Your App

Modernize Your Application

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Customers expect a fully modern and up to date iOS experience

- Stay current, adopt iOS features…

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Some example technologies:

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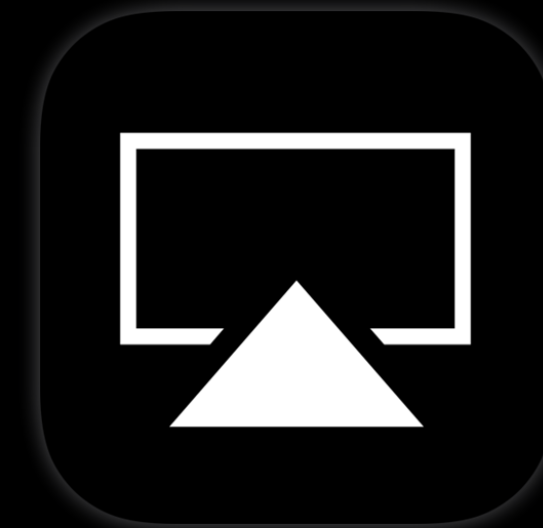• Stay current, adopt iOS features…

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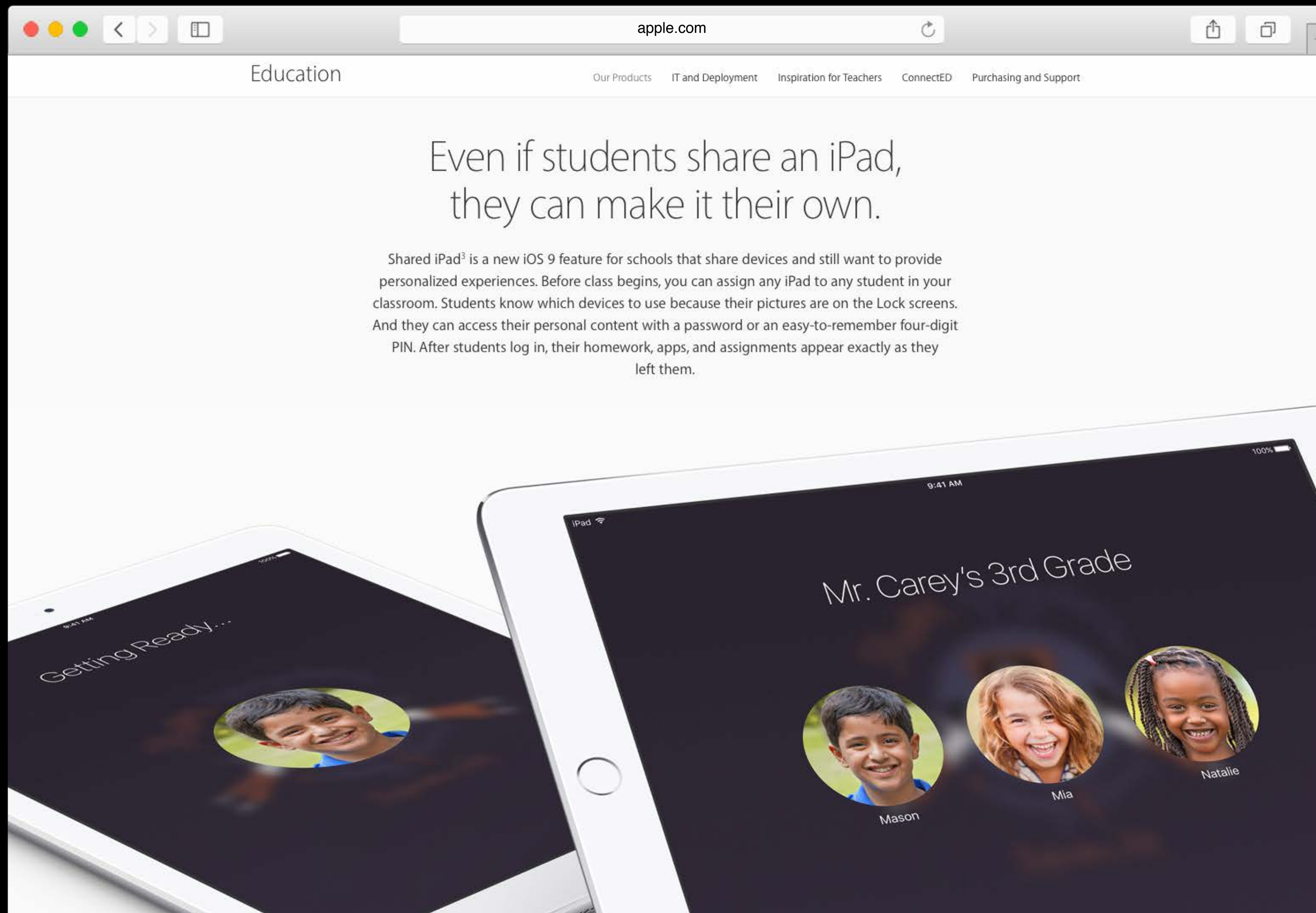
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Managed Apple ID is the user's sign-in

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Account data must be cloud based

- Student experience is the same on all Shared iPad

3rd Grade

Addison Aiden Anthony Ava Avery Brayden

Brooklyn Chloe Claire Ella Gabriel Gavin

Isabella Jordan Julia Kaelyn Landon Liam

Logan Lucas Mason Mia Natalie Noah

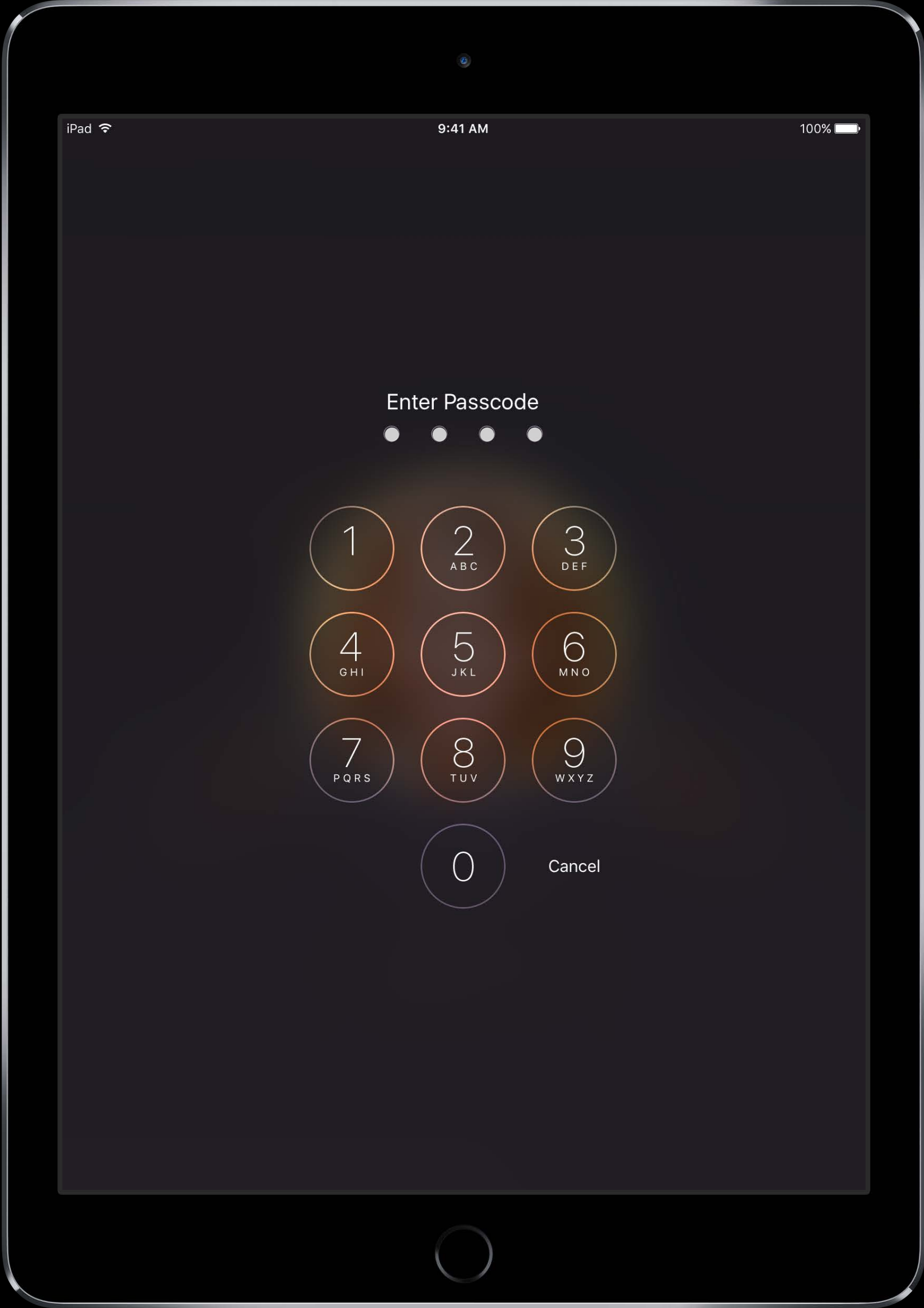Owen Riley Savannah Sophia Tristan Zoe
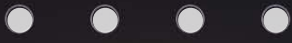
This iPad is managed by Township Schools.
Learn More...
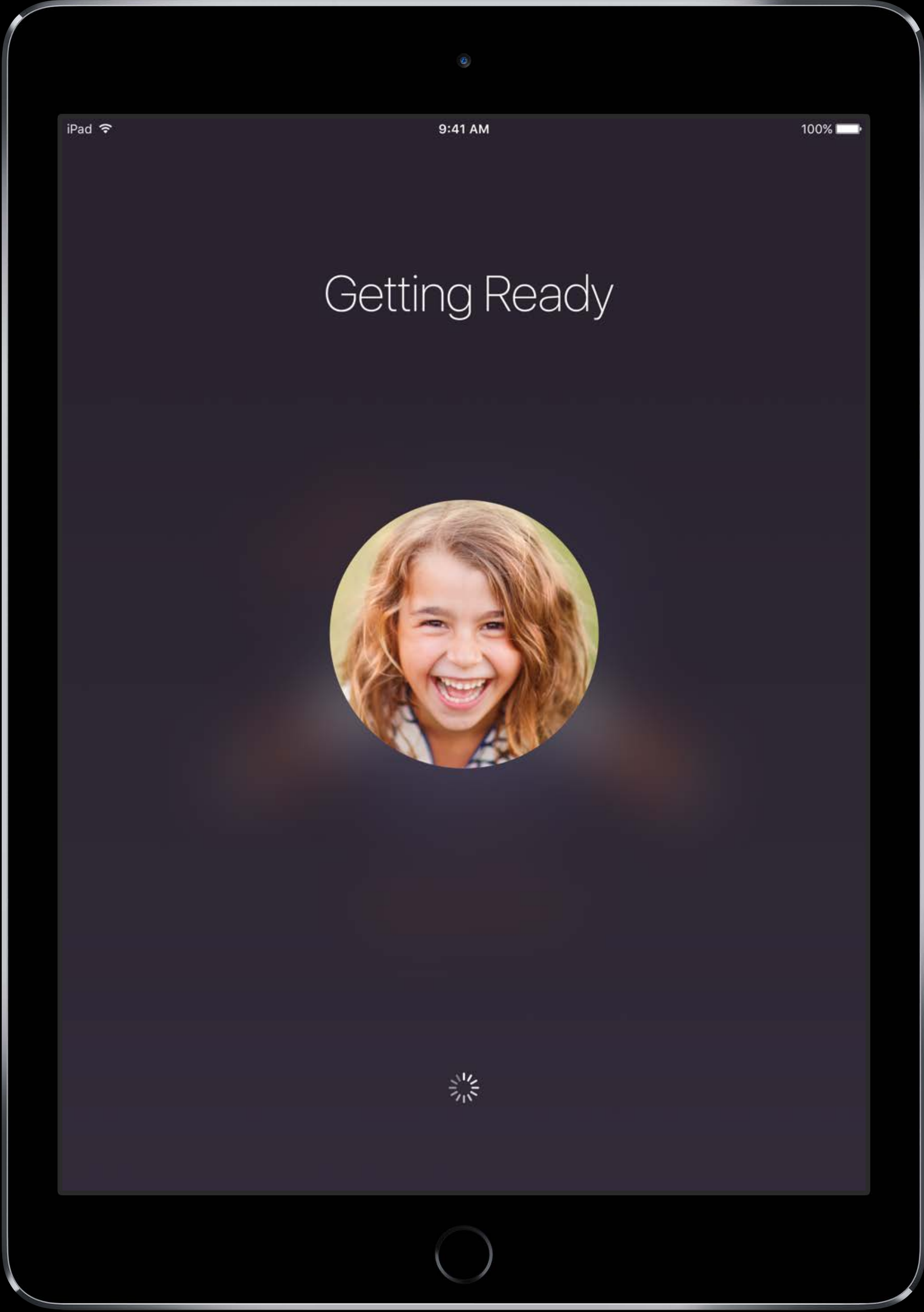
Enter Passcode

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1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
	0	Cancel

Shared iPad

All of Mia's data in the cloud

"Mia" may use a different iPad tomorrow

· Data may be purged by iOS

iOS provides four core cloud technologies

Quick overview of Shared iPad expectations

Shared iPad Behind the Scenes

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User switching

- Only one active user

- Sign out to switch to another user

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User data from the cloud is cached on device

- Improves performance

- Offline for field trips

- Cache data is purged by iOS if necessary

Move Your App Data Into the Cloud

Consistent user experience on different devices

Move Your App Data Into the Cloud
Consistent user experience on different devices

iOS cloud technologies

- CloudKit, iCloud Drive, `NSUbiquitousKeyValueStore`, KeyChain

- `NSURLSession` for all networking

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Flush data to cloud opportunistically

- Sync data before `applicationWillResignActive` events

- iOS will sync pending data when a user is not active

  - Background sync process for pending sync

CloudKit and iCloud Drive

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CloudKit can store structured app and user data

- Syncing of data is taken care of automatically

- "LongLivedOperations" from the CKOperation Class will flush in background

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CloudKit is suitable for larger data sets

NSUbiquitousKeyValueStore

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Requires an entitlement

- Drop in replacement for NSUserDefaults

- Easy to adopt for your app data

  - NSDictionary style data

  - Smaller payloads only please

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Data fetched as part of account sign-in

- Prepares your app to be managed via Application Management

- MDM deployments can provide initial application state

NSUbiquitousKeyValueStore

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Example use case for Shared iPad

- Store your initial app setup data in NSUbiquitousKeyValueStore

- Apple apps use it for Stocks for ticker and locations for Weather

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Don't use the Keychain for bulk data

NSURLSession

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Best option for existing cloud storage that isn't iCloud-based

- Your app should be using NSURLSession for all networking operations

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IPv6 cellular data control/accounting

robust data throttling

seamless network transport transition between Celluar/Wifi
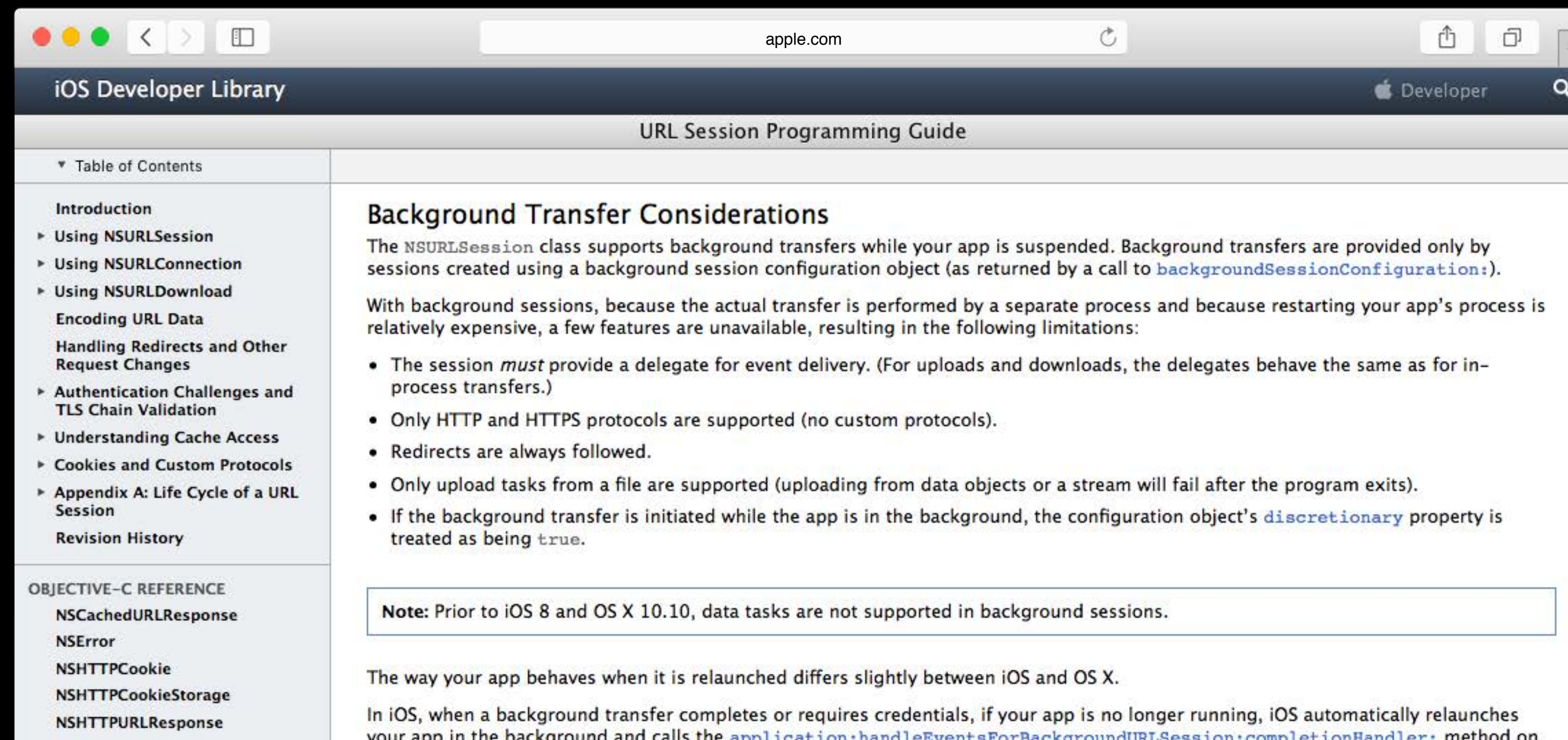
Cisco fast lane support, etc…

NSURLSession

Best option for existing cloud storage that isn't iCloud-based

• Your app should be using NSURLSession for all networking operations

Optional background configuration

• Data sync when your app is not in the foreground

Shared iPad Best Practice

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iOS NSURLSession for all custom networking

Additional Considerations

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Shared iPad is a powerful new feature in iOS 9.3

- Data separation for user accounts

- App shouldn't store data for multiple users

  - Don't co-mingling multiple user data: Rely on data separation

- Shared iPad will enforce quotas

  - Number of accounts cached on device

  - Amount of data stored per-user

  - Treat EDQUOT error same as ENOSPC

On-Demand Resources

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On-Demand Resources improve Shared iPad environments

- Using ODR avoids downloading assets for each user

  - Better performance, avoids quota use, less networking

  - App resources not duplicated across the device

  - Not purged when a user account is purged—better performance

On-Demand Resources

iOS Developer Library

 Developer

On-Demand Resources Guide

Search iOS Developer Library

Setting Up On-Demand Resources

On-Demand Resources Essentials

Enabling On-Demand Resources

Creating and Assigning Tags

Platform Sizes for On-Demand Resources

Managing On-Demand Resources

Hosting On-Demand Resources

Designing for On-Demand Resources

Revision History

On This Page ∨

Type	Asset catalog	File
Data file	✓	✓
Image	✓	✓
OpenGL shader	–	✓
SpriteKit particle	–	✓
SpriteKit scene	–	✓
SpriteKit texture atlas	✓	✓
Apple TV Image Stack	✓	✓

A data file can contain any sort of data except for executable Swift, Objective-C, C, or C++ code. Files generated by scripting languages can be on-demand resources.

Benefits of On-Demand Resources

Some of the main ways apps can benefit from on-demand resources include:

- **Smaller app size.** The size of the app bundle downloaded by the user is smaller resulting in faster downloads and more storage room on the device.

- **Lazy loading of app resources.** The app has resources that are used only in certain states. The resources are requested when the app is likely to enter the appropriate state. For example, in a game with many levels, the user needs only the resources associated with the current and next levels.

- **Remote storage of rarely used resources.** The app has resources that are used infrequently. The resources are requested as they are needed. For example, an app tutorial is usually shown once after the app is opened for the first time, and may never be used again. The app requests the tutorial on first

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Review your usage of Remote notifications

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Check for specific features/frameworks you need

- Managed Apple IDs will return proper errors for disabled features

  - StoreKit, for example, is disabled for Managed Apple IDs

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Follow existing app licensing strategies

- VPP and Device-based licensing is the deployment model for Shared iPad

Web Developers

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- Consider moving it to a native app

- Customers overwhelming prefer this option

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If your website requires user authentication

- Consider Safari password autofill

- Shared iPad requires a Safari domain
  whitelist to allow password autofill
  for websites

- Update your documentation

  - This will allow Safari autofill

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Business use cases also favor the cloud

- More likely to transition devices and repurpose them as needs change and jobs change

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Cloud data storage is the long-term trend

Testing Your App for Shared iPad

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Three methods for testing

- Two devices: Verify data propagates between devices

- Same device: Add/remove your app

- Extreme: Erase the device

  - Configure user account: See if all your app data comes back

Testing Your App for Shared iPad
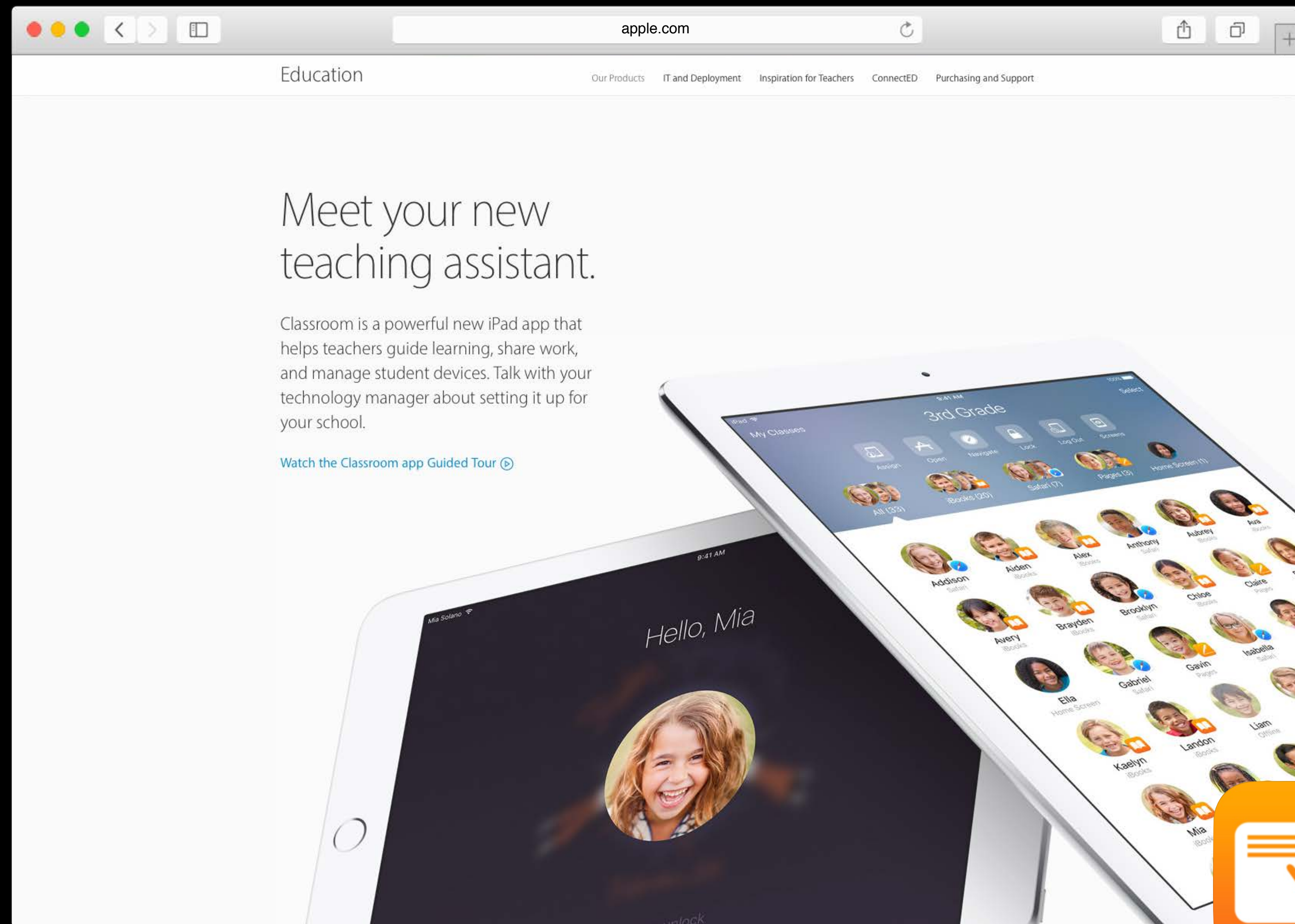
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Make sure your app doesn't block sign-out

- Don't leak UIKitBackgroundTask

Opportunities to Go Beyond the Cloud
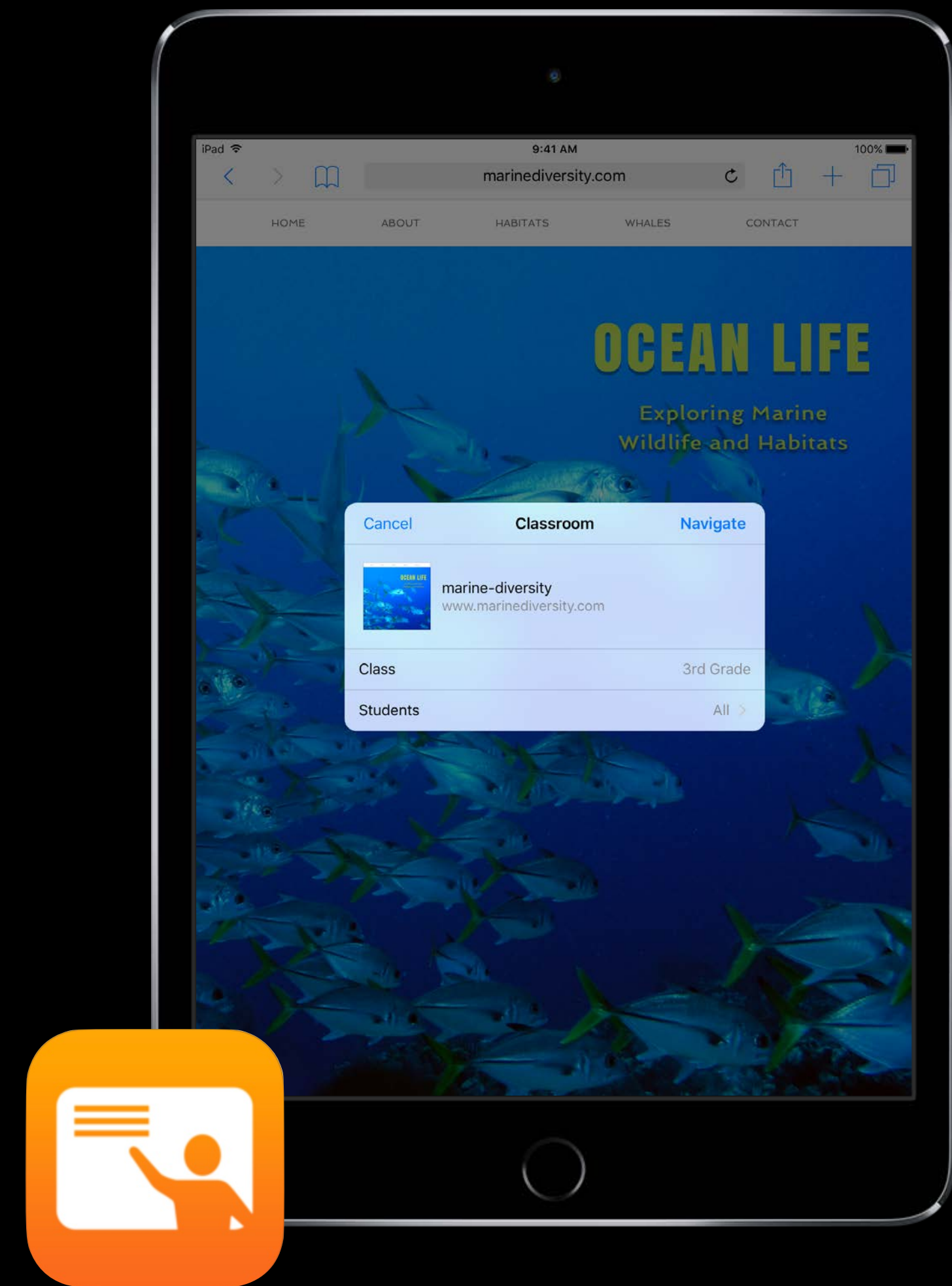
Classroom App

Universal Links

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iOS can search inside your app

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- Quickly navigate to the same place
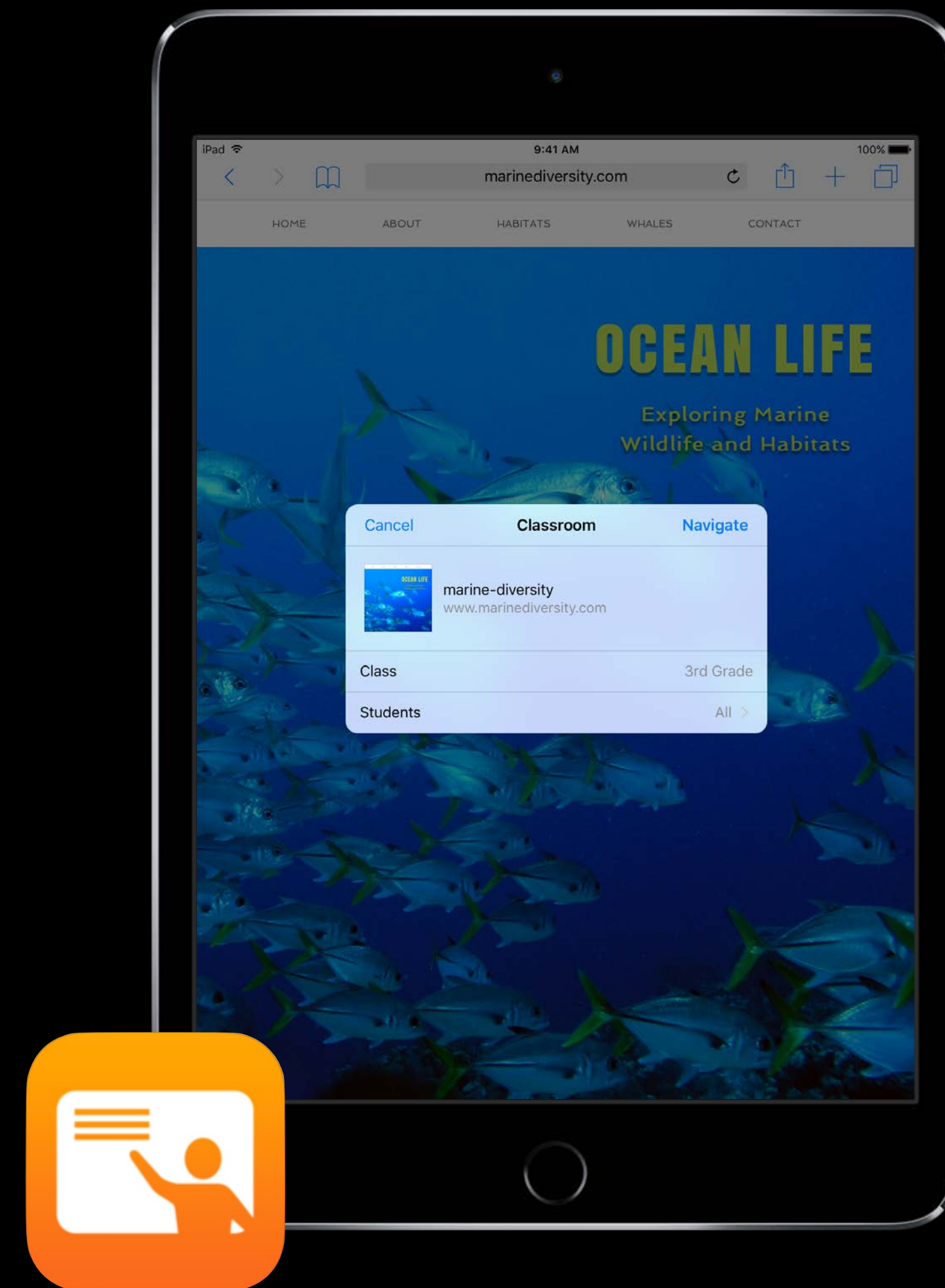 on two different devices

Universal Links

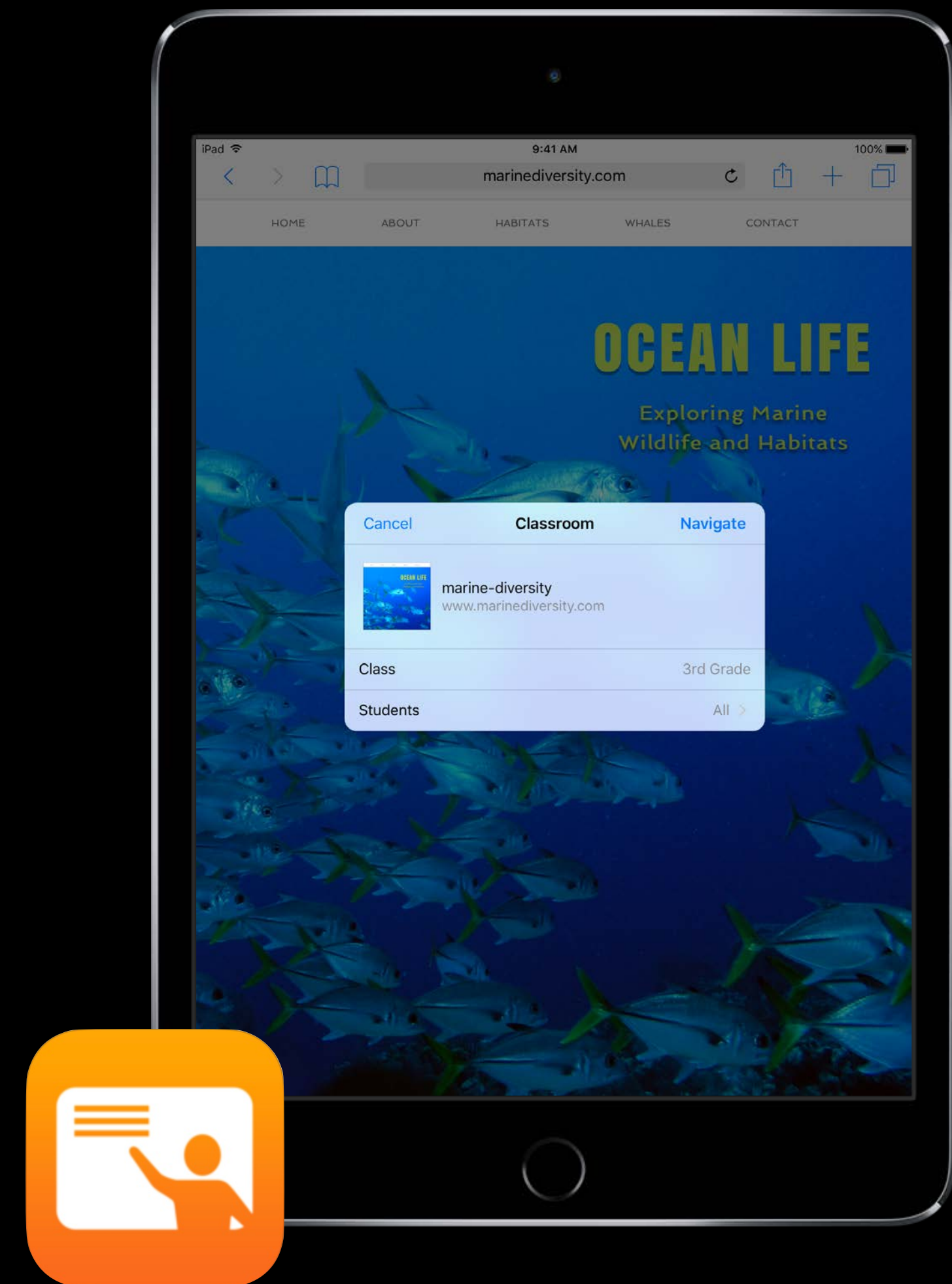Universal Links introduced with iOS 9

Powerful feature that allows shared links

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- Quickly navigate to the same place
  on two different devices

New for this year is Classroom app

- Teachers can integrate into class curriculum

What's New in iOS 9.3.2

Automatic assessment configuration

Continues to work same way on supervised devices

New entitlement

API then disables five features while app is running

- Auto correction, Define, keyboard shortcuts, predictive keyboard, spell check

Safe escape behavior on unmanaged devices

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AppConfiguration community is new this year

- MDM developers standardizing payloads

- http://appconfig.org

- One app - multi-MDM support

Managed Application App Adopters

iPhone

iPad

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iPhone

iPad

Managed Application App Adopters

Best Apps Leverage iOS

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More Information

https://developer.apple.com/wwdc16/304

Related Sessions

What's New in Apple Device Management	Nob Hill	Wednesday 11:00AM
Improving Existing Apps with Modern Best Practices	Presidio	Wednesday 3:00PM
Optimizing On-Demand Resources	Mission	Thursday 10:00AM
Extending Your Apps with SiriKit	Nob Hill	Thursday 1:40PM
What's New with CloudKit	Presidio	Thursday 3:00PM
CloudKit Best Practices	Pacific Heights	Friday 9:00AM

Labs

NSUsserActivity, Universal Links and Handoff Lab	Frameworks Lab A	Tuesday 10:00AM
Accessibility and Speech Lab	Frameworks Lab C	Wednesday 2:30PM