Week 4: Advanced Topics and Deployment

Unit 1: Adding the Search Bar to the UI

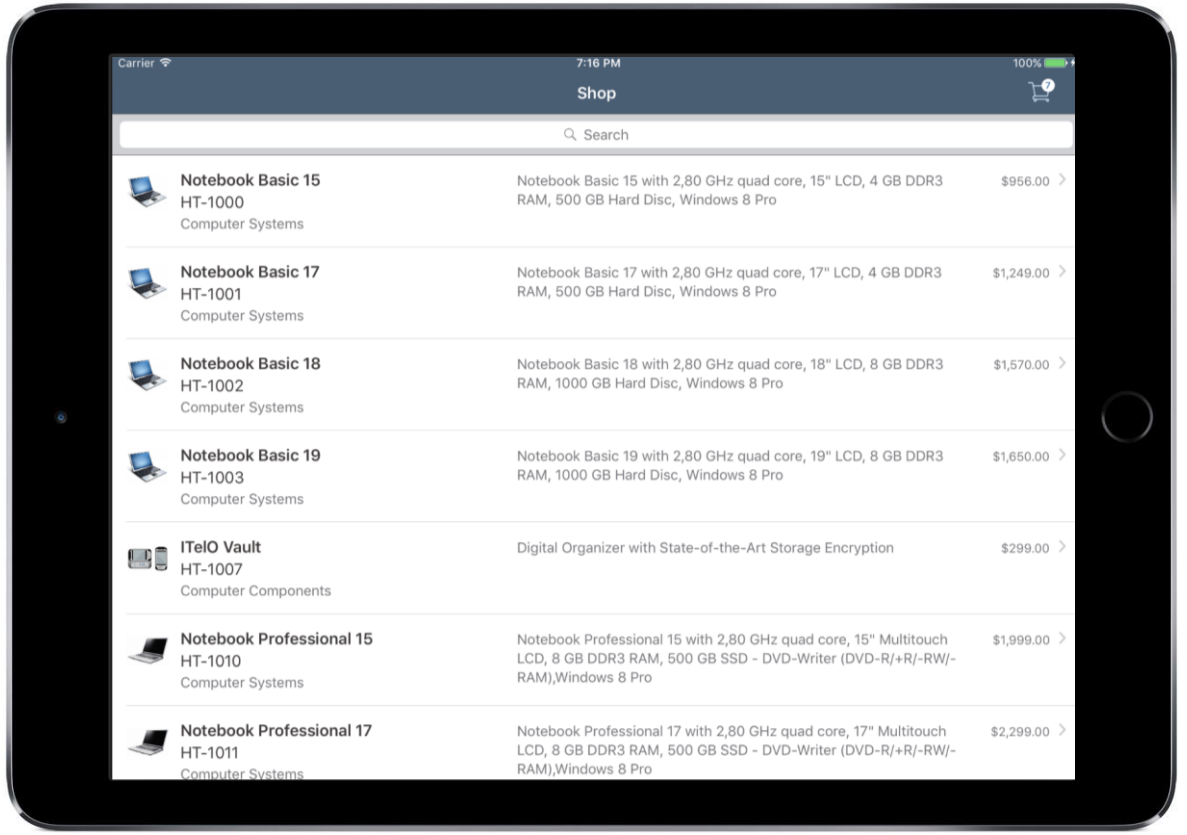
SAP Run Simple

openSAP
open.sap.com

Adding the Search Bar to the UI

Goal:

- Add a search bar to the products list UI



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Adding the Search Bar to the UI

Hands-on

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 2: Implementing the Search for Products

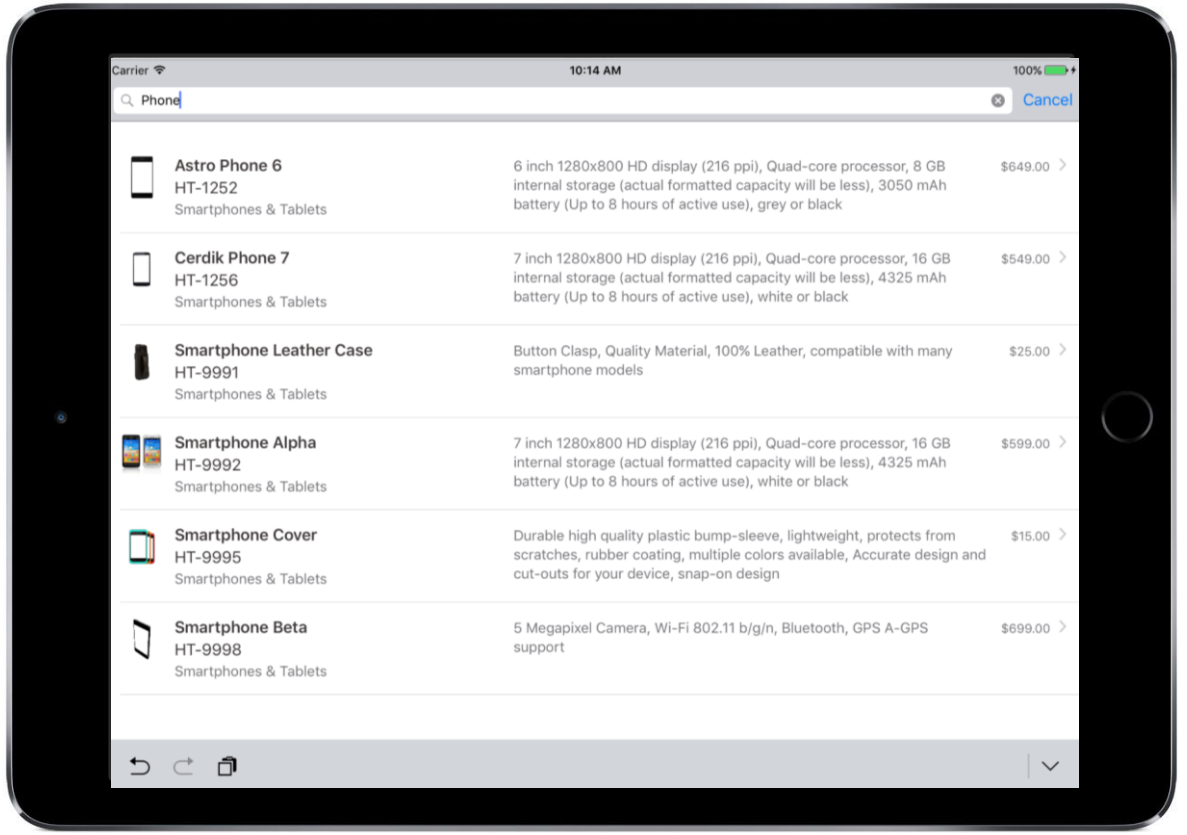
SAP Run Simple

openSAP
open.sap.com

Implementing the Search for Products

Goal:

- Implement the search functionality



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Implementing the Search for Products

Hands-on

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 3: Preparing the UI for Sort and Filter

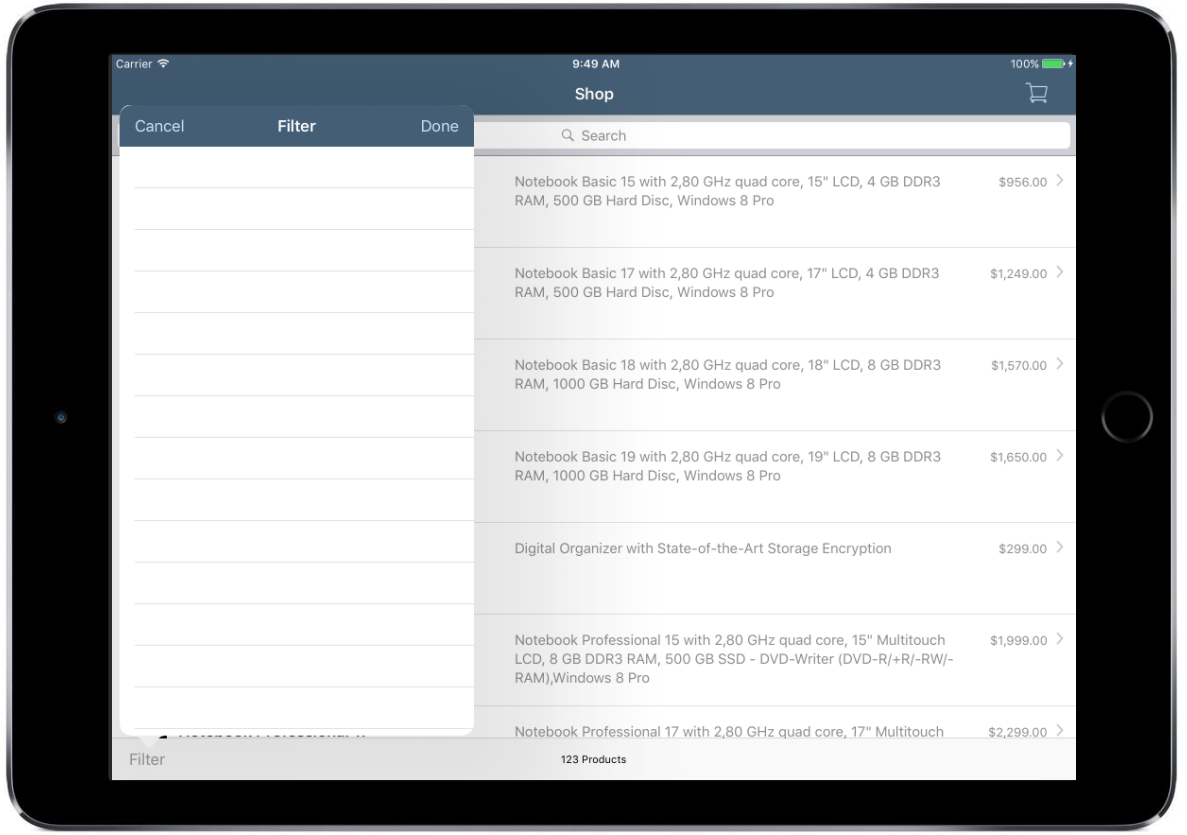
SAP Run Simple

openSAP
open.sap.com

Preparing the UI for Sort and Filter

Goal:

- Add a filter button and product count to the toolbar at the bottom of the product list
- Prepare an empty filter popup



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Preparing the UI for Sort and Filter

Hands-on

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 4: Implementing Sort

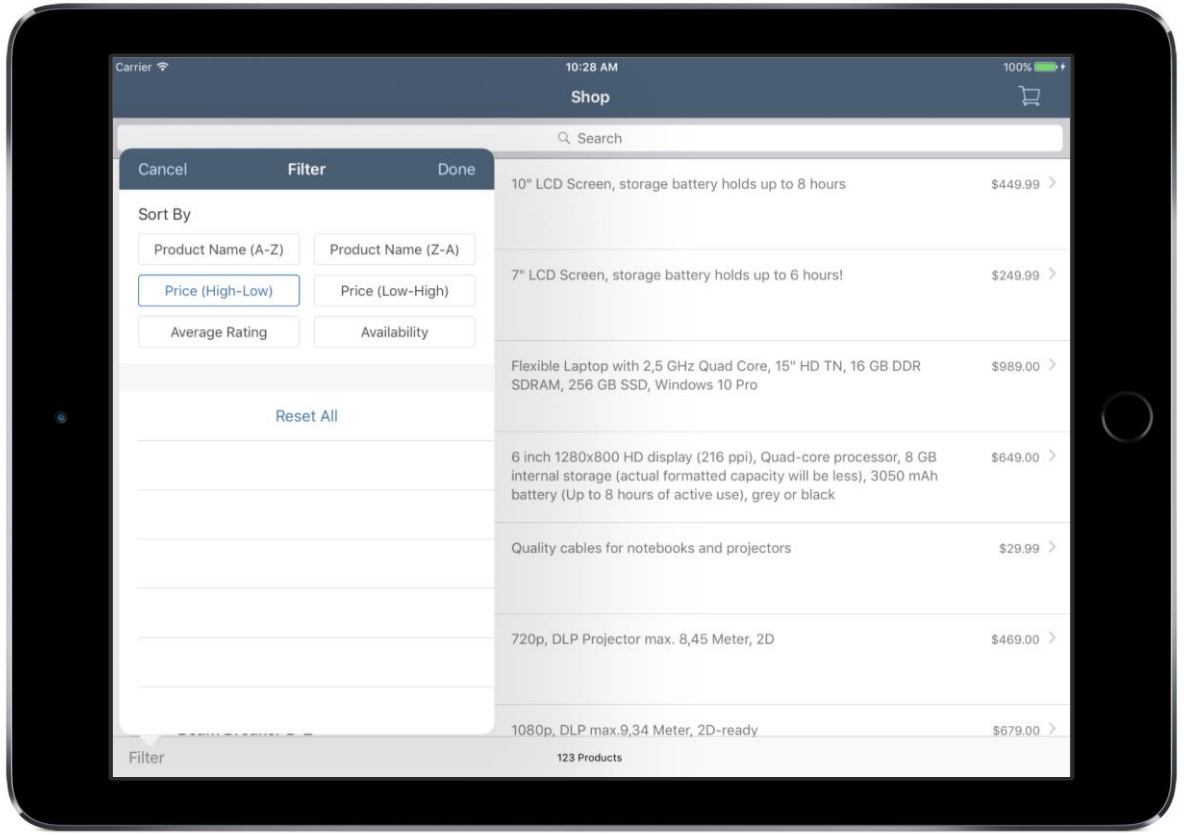
SAP Run Simple

openSAP
open.sap.com

Implementing Sort

Goal:

- Add sort options to the filter popup
- Implement sort functionality



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Implementing Sort

Hands-on

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 5: Deploying Your Final Shopping Cart App

SAP Run Simple

openSAP
open.sap.com

Deploying Your Final Shopping Cart App

Wrap-up Week 4: hands-on Shopping Cart app development

Week 1 | Week 2 | Week 3 | **Wrap-Up – Week 4**

Xcode Project Setup

Back-End Connectivity

User Experience

Advanced Topics and Deployment

- Add Search Bar
- Implement Search Bar
- Sorting

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Deploying Your Final Shopping Cart App

Demo

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 6: Introduction to Offline OData

SAP Run Simple

openSAP
open.sap.com

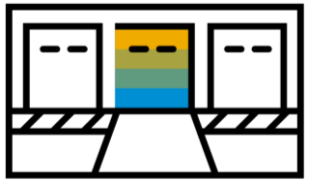
Introduction to Offline OData

Examples of use cases

Asset Maintenance

- Pre-shift activities for an electrical utility engineer
- Predictive maintenance
- Support emergency work

Retail Execution



- Plan retail visits
- Manage activities and tasks
- Conduct surveys and audits
- Perform compliance checks
- Create sales orders and returns

Direct Store Delivery

- Flexible and integrated planning and execution
- Improve customer relationships while lowering costs
- Increase visibility into direct store delivery processes

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Overview

Offline OData: Build offline-enabled applications using the same APIs as for a purely-online application.

Myth

Adding offline capability is as easy as writing a few lines of code

Reality

Important design considerations

Conflict resolution/error handling

- Performance
- Data volume
- Transaction behavior (batched instead of immediate)
- Temporary, client-side-only keys

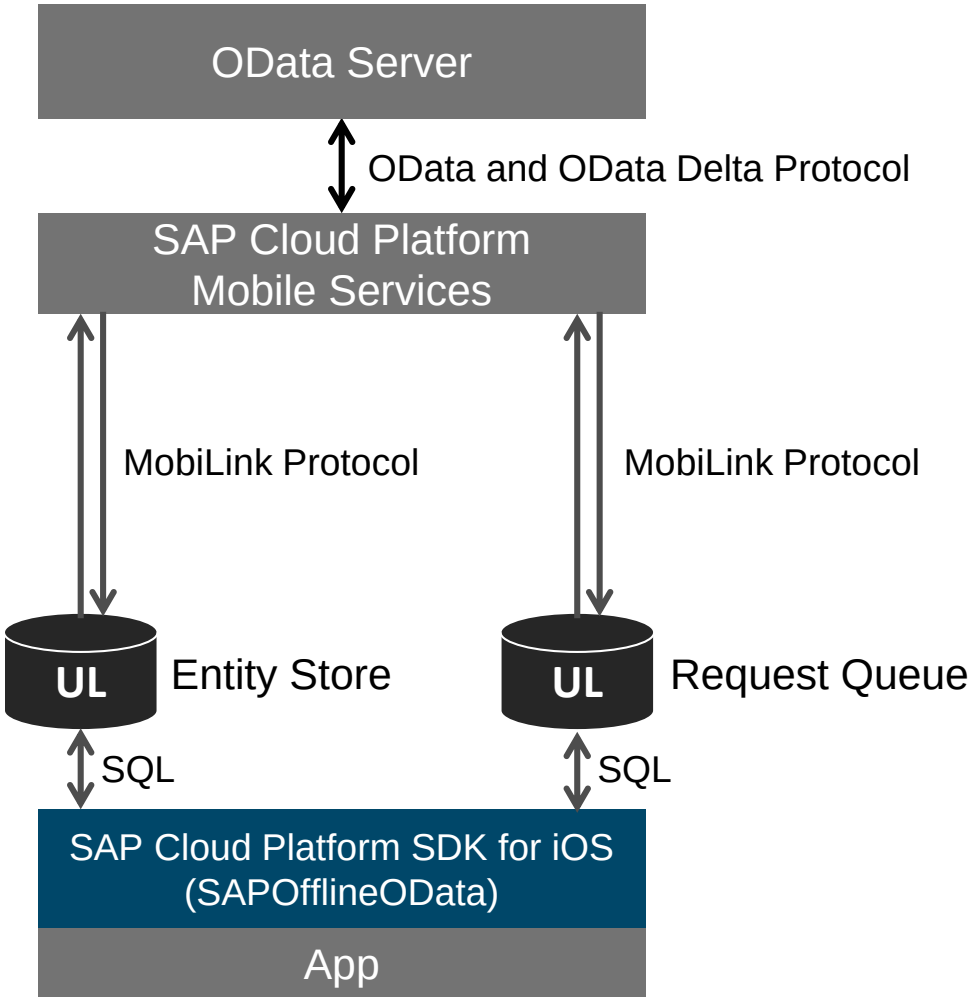
© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

High-level architecture

Communication between the client and SAP Cloud Platform Mobile Services uses the proprietary MobiLink protocol

- Entity store contains
  - Defining queries and delta links
  - Metadata information
  - Data from the back end
- Request queue contains
  - CUD operations
  - Response info (including errors)
  - Local key to real key mapping (temporarily)



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Upload and download

Upload

- Uploads the operations in the request queue to the server
- Resolves local IDs to real IDs
- Records error information and puts affected entities into the error state
- Does not download new data from the back end to the entity store

Download

- Downloads data from the back end so that it matches on the client
- Resolves local entities/relationships with back-end data

Upload and download do not need to be performed together

- Typically, an upload should be performed before a download, but the opposite is not required
- Example: It would be perfectly valid for an app to upload many times throughout the day and then just download once in the evening

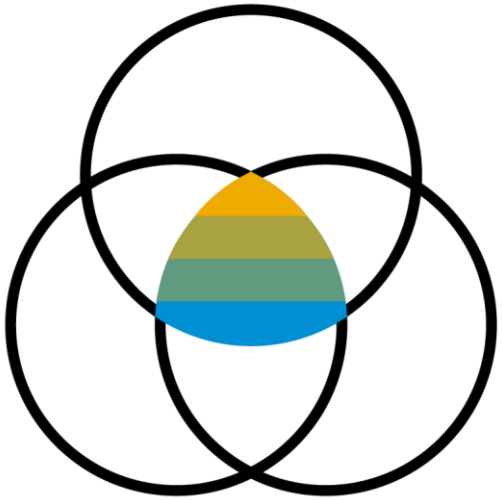
© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Deltas

Delta

All the data can be sent during a download, but generally, that will be too expensive.
A better approach is to only send what has changed (the delta).



Two places where deltas come into play:

- Between Mobile Services and the client device (MobiLink protocol)
- Between the OData back end and Mobile Services (OData delta protocol)

Maximize performance: The OData delta protocol SHOULD be implemented by the OData back end to ensure that only the changes are sent to Mobile Services.

By default, if no OData deltas are provided by the OData back end, Mobile Services will compute the delta to be sent to the client.

- This is an expensive and generic approach, but a workable solution in some cases

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Shared data

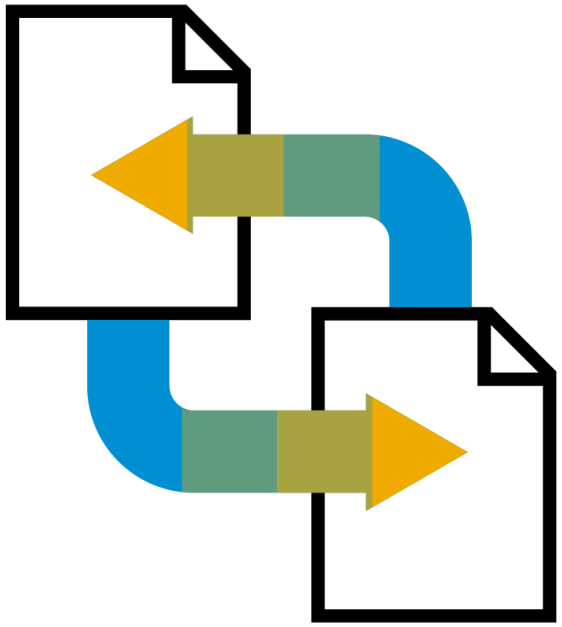
A defining query that returns the same data for all clients (or a group of clients) should be marked as shared.

Shared defining queries are cached in Mobile Services so that all clients can retrieve the shared data from the cache instead of all going to the back end.

Marking a defining query as shared is as simple as uploading an INI file with the defining request marked with is_shared_data=Y.

The INI file can also be used to configure how often the shared data should be updated.

Taking advantage of shared data will reduce the load on the OData back end, and can therefore result in an overall improvement in performance.



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Reading data in pages

Use case

- The application needs to display the data to the end user

Problems

- The device can only display a limited amount of data on the screen at one time
- Loading all entities into memory at one time is not feasible

Solution

- Read the data in pages
- Use client-driven paging; add $top and $skip to the local queries OR
- Use server-driven paging; specify the page size (using a Prefer: odata.maxpagesize header or store option) and the SDK will return a next link if there is more data

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Error handling

When OData requests submitted by Offline OData as part of the upload fail, the errors are returned to the device and the entities involved in the failed request are put into an error state.

Mobile Services will not send subsequent requests that depend on a failed request.

When the upload completes, the errors that occurred are available to the app in a special entity set called the ErrorArchive, which can be queried just like any other entity set.

After the upload, it is up to the app to fix any errors. This is typically done by issuing subsequent OData request(s) to fix the problem.

When an upload is called with failed requests in the queue, a merge algorithm is run to merge the failed requests with new requests referencing the same entity to attempt to create requests without the errors.

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Introduction to Offline OData

Repeatable requests

When an upload operation itself fails (not the requests in the upload), the information what operations were sent and completed by the OData server, is also lost.

As a result, in the next upload, all operations need to be resent to the OData back end.

Repeatable requests is a feature that OData servers can support to prevent the same operation (for example, a POST) from being executed more than once.

Repeatable requests is not part of the OData standard directly, but is an OData standards committee note.

Repeatable requests is important for all OData back ends, but in particular for those used with Offline OData.

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 7: Security Concept Overview

SAP Run Simple

openSAP
open.sap.com

Security Concept Overview

iOS security

System / Platform Security

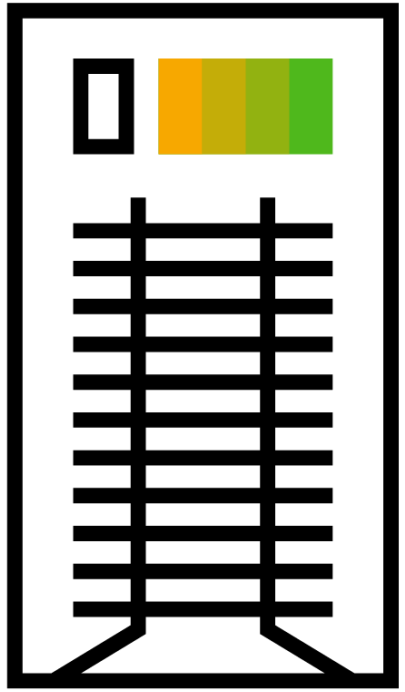
- Hardware/software integrated, secure boot, data protection (secure enclave), Code signing (OS and apps)
- Touch ID (passcode adoption from 50% up to 90%)
- OS updates and security patches; 85% of devices are running latest version

Data

- Data encryption built into hardware (AES-256); file level encryption on top (based on passcode)
- App transport security; VPN; WPA2 Wi-Fi

Apps / Developers

- Security APIs (Touch ID, iCloud Keychain, NSURLSession…)
- Curated App Store
- Sandboxing; data isolation, transparency consent control (entitlements)



More information at: https://developer.apple.com/videos/play/wwdc2016/705

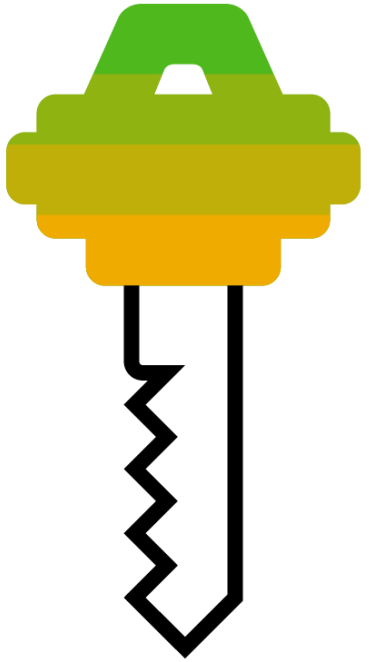
© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Security Concept Overview

SDK, SAP Cloud Platform, and Mobile Services

- Optional additional encryption in database store, cache, offline store for multi-user scenarios
- Support for Touch ID and application passcode

- Authentication via OAuth2/SAML/X.509 client certificates/basic authentication
- Integration of Enterprise IdP
- SAP Cloud Connector for on-premise connectivity



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Security Concept Overview

Onboarding flows

Bootstrapping the app

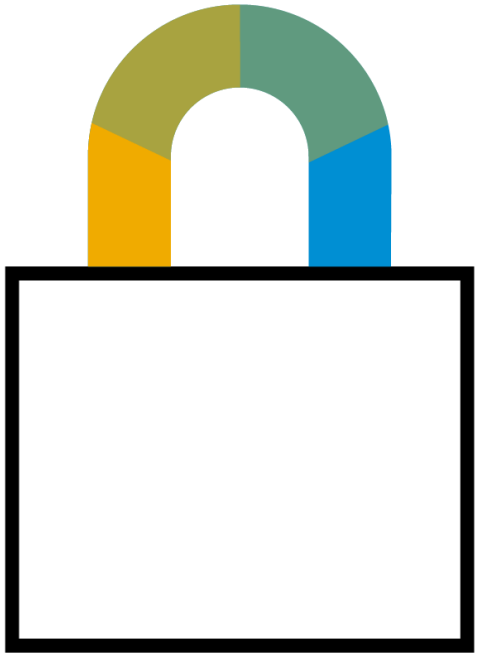
- Discovery service, MDM, file configuration, QR code

User authentication – OAuth2

- redirect handling and web views, token persistence

Protecting application access

- App passcode, Touch ID, device security



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 8: SAP Academy for iOS

SAP Run Simple

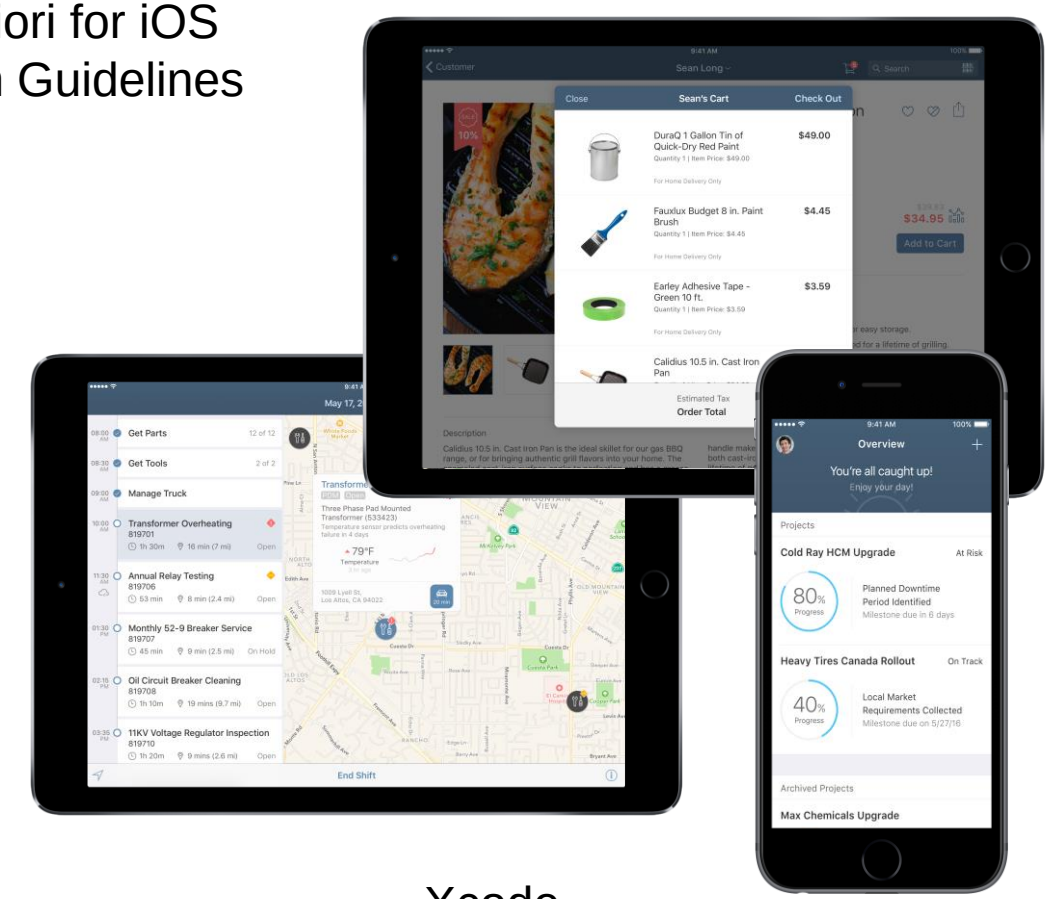
openSAP
open.sap.com

SAP Academy for iOS

SAP Academy for iOS enables you to build great SAP Fiori for iOS apps

SAP Fiori for iOS Design Guidelines

SAP Cloud Platform SDK for iOS



SAP Cloud Platform

SAP Cloud Platform Mobile Services

Swift

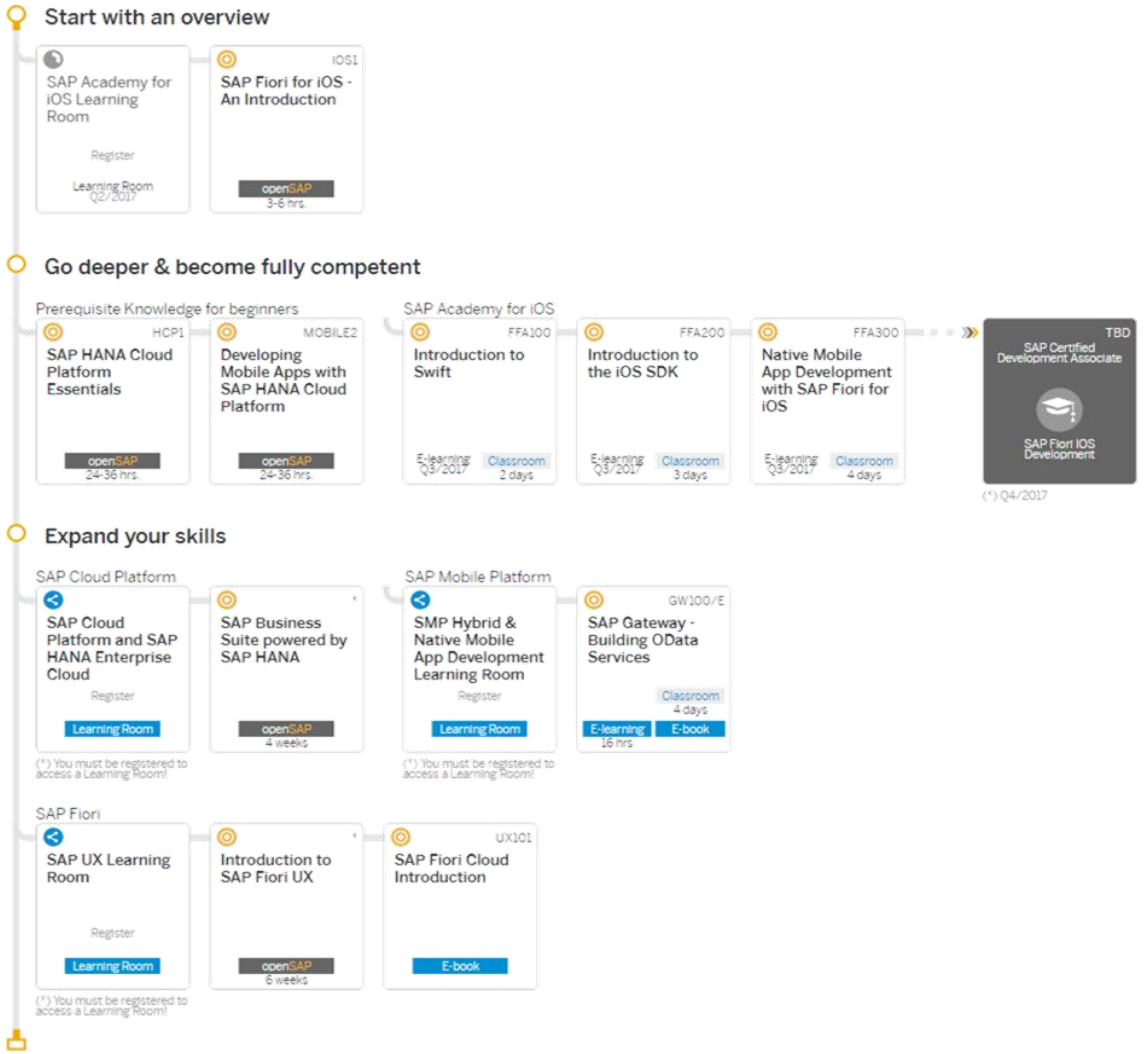
Apple iOS SDK

Xcode

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

SAP Academy for iOS

Learning Journey for the mobile developer



[Link to Learning Journey]

[Introduction to Swift]

[Introduction to the iOS SDK]

[Native Mobile App Development with SAP Fiori for iOS]

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Week 4: Advanced Topics and Deployment

Unit 9: Wrap-Up

SAP Run Simple

openSAP
open.sap.com

Wrap-Up

App development with SAP Cloud Platform

Apps

SDK and front-end tools

Mobile services

Cloud platform services

Back-end systems

SAP Apps | Customer Apps | Partner Apps

SAP Cloud Platform SDK for iOS

SAP Fiori UI

OData Online | OData Offline

Foundation

SAP Fiori for iOS Mentor

Assistant

Apple Xcode

Offline | Push | Business Logic

Logging & Trace | Engagement Analytics | …

Identity | Integration | API Management

SAP HANA | Security | …

Cloud ↔ Cloud ↕ Cloud ↔ On-Premise

SAP S/4HANA | SAP | 3rd Party

© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Wrap-Up

Further resources

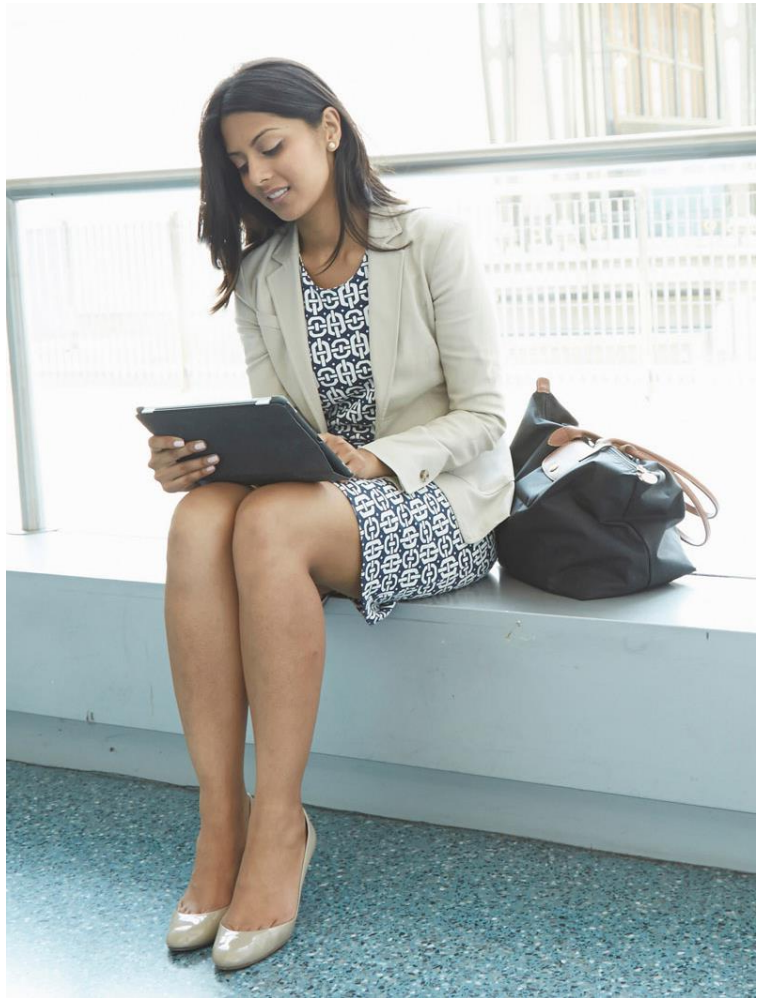
Apple’s Enterprise site for mobile iOS business apps
Apple Developer Resources for IT and Enterprise

SAP & Apple Partnership site
iOS Apps for Enterprise Mobility – SAP and Apple

SAP Developer Community site
SAP Cloud Platform for iOS – Developer Resources

SAP User Experience Community
SAP Fiori for iOS – Design Guidelines

SAP documentation
SAP Cloud Platform SDK for iOS documentation



© 2017 SAP SE or an SAP affiliate company. All rights reserved. I PUBLIC

Thank you.

Contact information:

open@sap.com

© 2017 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
See http://global.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.