Agenda

- Introduction
- Enterprise Mobility Management
- Mobile Enterprise Application Platforms & Tools
- Requirements for the Mobile Enterprise
- One More Thing
Introduction

Mobile Computing & Mobile Devices
Mobile Computing
Definition

Set of devices, systems and applications that provide spatial and context aware information and services to the mobile user.

- Mobility (space & time)
- Connectivity
- Spatial Context
# Market Share

## Operating System for Smartphones

<table>
<thead>
<tr>
<th>OS (Smartphones)</th>
<th>Thousands of Units (Q3 2011)</th>
<th>Market Share %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android</td>
<td>296,913</td>
<td>86.2</td>
</tr>
<tr>
<td>iOS</td>
<td>44,395</td>
<td>12.9</td>
</tr>
<tr>
<td>Windows</td>
<td>1,971</td>
<td>0.6</td>
</tr>
<tr>
<td>BlackBerry</td>
<td>400</td>
<td>0.1</td>
</tr>
<tr>
<td>Other</td>
<td>681</td>
<td>0.2</td>
</tr>
</tbody>
</table>

[Gartner, Market Share: Mobile Phones by Region and Country, 2Q16, 2016]
Mobile Apps
Motivation

- Transformational mobile apps deliver the value of digital business cases
- 87% of executives believe that mobile apps are necessary to realize the full benefits of Digital *
- 85% of Executives believe apps are the dominant interface of the future *

Enterprise Mobility Management

Mobile Device & Application Management
Enterprise Mobility Management (EMM)*
Overview

Management and monitoring of mobile devices and related services

Responsibilities (selection):
• Inventory of Hard- and Software
• Configuration management of OS
• Remote monitoring and maintenance
• Distribution of mobile apps
• Mobile content management
• Security Management
• Backup / Restore

* extension of Mobile Device Management (MDM)
Enterprise Mobility Management Examples

- AirWatch Mobile Device Management ¹
- Citrix XenMobile ²
- IBM MobileFirst Management ³
- SAP HANA Cloud Platform, mobile service for app and device management⁴

² [http://www.citrix.de/products/xenmobile/overview.html](http://www.citrix.de/products/xenmobile/overview.html)
⁴ [https://hcp.sap.com/capabilities/mobile/mobile-secure-services.html](https://hcp.sap.com/capabilities/mobile/mobile-secure-services.html)
Enterprise Mobility Management
Magic Quadrant by GARTNER

[GARTNER, Magic Quadrant for Enterprise Mobility Management Suites, 2016]
SAP HANA Cloud Platform, mobile service for app and device management

Integrated Enterprise Mobile Management SaaS solution running on SAP HANA Cloud Platform.

- Increase mobile app adoption
- Lower the overall cost of supporting enterprise mobility
- Improve enterprise compliance and security

[https://hcp.sap.com/capabilities/mobile/mobile-secure-services.html]
SAP Mobile Secure (SAP Afaria for MDM)
Basic Architecture - on premise installation

[SAP 2015]
SAP Afaria
iPhone Client (v6.60.x)

MDM with iOS
Open Mobile Alliance Device Management (OMA DM)

Open standard for management of small devices (mobile phones, PDAs,..)
- Provisioning
- Configuration
- Software installation / upgrading

- XML (subset of SyncML)

www.oma.org
MDM – Protocol
Supported Queries

Device Information
- UDID (Unique Device Identifier), device name, iOS- & build-version, serial number, IMEI, modem firmware, network info, Bluetooth address, WiFi address, SIM network

Management
- Phone number, roaming settings (on/off)

Security information
- Installed configuration profiles, certificates, list of hardware encryption info

Applications
- Installed applications (App-ID, name, version, size), installed provisioning profiles
iOS Device Configuration
Deployment Options

Manually via Device
- iPhone Settings (app)
- Wired (USB)

XML Configuration File
- Configuration of passcode policy, restriction, wifi-settings, VPN, E-Mail settings, exchange settings, LDAP, calDEV, web clips, credentials
- Deployment via
  - USB
  - E-Mail
  - Website
  - Over-the-Air configuration (OTA)
iOS Mobile Device Management (MDM)
- Managed scaled deployments of iPhone and iPad
- Configuration profiles + OTA enrollment + APN service
iOS Configuration Profiles
Overview

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passcode Policies</td>
<td>Passcode policies and use requirements</td>
</tr>
<tr>
<td>Restrictions</td>
<td>Restriction of device features</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>Access to Wi-Fi networks</td>
</tr>
<tr>
<td>VPN</td>
<td>VPN server settings (account, proxy, authentication)</td>
</tr>
<tr>
<td>E-Mail</td>
<td>IMAP / POP mail settings</td>
</tr>
<tr>
<td>Exchange</td>
<td>Exchange settings (server, domain, account)</td>
</tr>
<tr>
<td>LDAP</td>
<td>LDAP directories</td>
</tr>
<tr>
<td>CalDEV</td>
<td>Calendar settings</td>
</tr>
<tr>
<td>Web Clips</td>
<td>Quick access icons for home screen</td>
</tr>
<tr>
<td>Credentials</td>
<td>Identity of users (VPN, WPA2, …)</td>
</tr>
<tr>
<td>Advanced</td>
<td>APN (access point name)</td>
</tr>
</tbody>
</table>
Device Configuration
Examples

Passcode Policy:
- Password required (to protect device)
- Strong passcode
- Passcode length set to 7 or more characters
- 3 minutes before auto-lock
- 10 failed attempts before wipe

Change of VPN infrastructure (company/department/…)
- Update of account information
  => central OTA installation for all devices
- Manual configuration by employees not necessary
iOS Configuration File
Sample Payload (*.plist)

```xml
<plist version="1.0">
  <dict> <key>assignedObject</key> <dict/>
  <key>restrictedBool</key> <dict>
    <key>allowAccountModification</key> <dict><key>value</key> <true/></dict>
    <key>allowAddingGameCenterFriends</key> <dict><key>value</key> <true/></dict>
    <key>allowAppInstallation</key> <dict><key>value</key> <true/></dict>
    <key>allowAppRemoval</key> <dict><key>value</key> <true/></dict>
  </dict>
</plist>
```

![iOS Configuration File](image)
Mobile Application Management
Mobile Application Management (MAM)

Management of mobile “in-house” enterprise applications
- “Enterprise App Stores”

Responsibilities (Apps):
- Delivery
- Security
- Updating
- User authentication
- Push services

Examples:
- Citrix
- Airwatch
- VMWare

Enterprise equipment
Enterprise infrastructure
Enterprise Information Systems
SAP HANA Cloud Platform, Mobile Service Discovery Service Overview

[https://help.hana.ondemand.com/hana_cloud_platform_mobile_services/frameset.htm?a2e40dcb50174e7598f6955678e32bc7.html]
Mobile Applications at SAP
SAP Store for Mobile Solutions

SAP Store for Mobile Solutions: https://store.sap.com
Mobile Enterprise Application Platforms

Cross-Platform Development

Enterprise Mobility System Life Cycle

Assess  Design  Implement  Maintain  Evolve
Mobile Computing for Enterprise
Cross-Platform Challenges for Enterprise

Integration of Enterprise Information Systems (EIS)
- Back-end connectivity & synchronization of enterprise data

Mobile Development & Platform Diversity
- Operation system, device sensors, display resolution, …

Lifecycle for Mobile Enterprise Applications
- Planning, development, update, maintenance, …
Mobile Enterprise Application Platform (MEAP)  
Rule of Three by Gartner

MEAP offers significant advantages:

- When there are 3 or more mobile applications
- When there are 3 or more targeted operating systems or platforms
- When they involve the integration of 3 or more back-end systems

Example

- SAP Productivity Apps, e.g.:
  - SAP Timesheet
  - SAP Quality Issue

[Gartner]
Mobile Application Development Platforms
Magic Quadrant by GARTNER

[GARTNER, Magic Quadrant for Mobile Application Development Platforms, June 2016]
Mobile App Development
End-to-End Lifecycle

- Discover
- Prototype
- Develop
- Test
- Package
- Deploy
- Extend

- SAP Build
- SAP Web IDE
- SAP Fiori, cloud edition

- Business Expert
- Coder

- SAP HANA Cloud Platform

- HCP mobile service for SAP Fiori
- HCP mobile service for app & device management
- HCP mobile service for development and operations
BUILD
Creating User-friendly Interactive Prototypes

[https://www.build.me]
SAP HANA Cloud Platform,
mobile service for development and operations overview
SAP HANA Cloud Platform, mobile service for development and operations overview
SAP HANA Cloud Platform, mobile service for app and device management (TRIAL)

Secure Your Enterprise with SAP HANA Cloud Platform, mobile service for app and device management

Secure and Simplify Mobile App Data

SAP’s comprehensive mobile management and security portfolio embraces mobile device diversity while safeguarding corporate information.

IT no longer needs to struggle with disparate point solutions. SAP HANA Cloud Platform, mobile service for app and device management optimizes the mobile experience for users and protects the organization by sealing the vulnerable entry points: devices, apps, and content.

Click here to get started with a free trial

https://hcp.sap.com/capabilities/mobile/mobile-secure-services.html
SAP HANA Cloud Platform, mobile service for app and device management
SAP Web IDE
SAP Web IDE
Online Development Environment

Development Environment
• Source Code editor (incl. SAP UI5 code completion)
• Layout Editor (WYSIWYG)
• Instant application preview in browser
• Integrated deployment to SAP platforms (e.g., HANA Cloud Platform)
• Collaborative development and project persistency

Sample Templates
• Basic SAP UI5 Project
• SAP Fiori Application
• SAP Fiori Extension
• SAP Hybrid Mobile
SAP Web IDE
Online Development Environment
OData
OData
“ODBC for the Web”

Open Data Protocol (OData)
- Open web protocol for querying & updating data (Microsoft-owned)
- Based on industry standards (HTTP, XML, Atom)
- Rest-based architecture (standard GET, PUT, POST & DELETE)
- Formats (results)
  - JSON
  - XML
  - AtomPub (Atom Publishing Protocol)

http://www.odata.org/
OData
Example Queries

- GET ~/SalesOrders
- GET ~/SalesOrders('0123123')
- GET ~/SalesOrders('01230123')/Products
- GET ~/SalesOrders("01230123")/SalesOrderItems
- GET ~/SalesOrderItems(SalesOrderID='01230123',Position='0000000001')
- GET ~/SalesOrderItems(SalesOrderID='01230123',Position='0000000001')/Product
OData Example Response

<?xml version="1.0" encoding="utf-8"?>
<atom:entry
   xmlns:atom="http://www.w3.org/2005/Atom"
  <atom:content type="application/xml">
    <m:properties>
      <d:AirlineId>AA</d:AirlineId>
      <d:ConnectionNo>17</d:ConnectionNo>
      <d:FlightDate>2013-01-03T00:00:00</d:FlightDate>
      <d:CustomerNo>0000276</d:CustomerNo>
      <d:Agency>000000055</d:Agency>
    </m:properties>
  </atom:content>
</atom:entry>
OData
Queries

Simple powerful query language for filtering, sorting, and paging

<table>
<thead>
<tr>
<th>Operation</th>
<th>Query option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtering</td>
<td>$filter</td>
</tr>
<tr>
<td>Projecting</td>
<td>$select</td>
</tr>
<tr>
<td>Sorting</td>
<td>$orderby</td>
</tr>
<tr>
<td>Paging</td>
<td>$top and $skip</td>
</tr>
<tr>
<td>Inlining</td>
<td>$expand</td>
</tr>
</tbody>
</table>

Filtering → $filter

- All flights with an identifier that is less than or equal to 9999:
  
  .../FLIGHTINFORMATION/?$filter=ID le 9999

[http://www.odata.org/developers/protocols/uri-conventions#QueryStringOptions]
Online App
Example: SAP Citizen Connect

Requirements for Mobile Enterprise
Enterprise Requirements
Motivation

Motivation
- Customer / Enterprise requirements

Goals
- Ensuring product quality and reliability
- Accurately quantifying of quality rating (defining concepts, terms, data formats, styles, techniques)

Examples for Standard Organizations
- ISO (International Organization for Standardization)
- ANSI (American National Standard Institute)
Enterprise Requirements
Quality Model

Software Quality ISO/IEC 9126-1
- Functionality
- Reliability
- Usability
- Efficiency
- Maintainability
- Portability

Additional Requirements
- Accessibility
- Branding
- Globalization
- Open Source & Third Party
Accessibility

Motivation
- Degree of ability to access a product, service or device
- Assist people with disabilities

Web Accessibility Initiative (WAI)
- W3C

Reporting
- VPAT (Voluntary Product Accessibility Template)
- Section 508 (U.S. Rehabilitation Act of 1973)
  => Requirements software used by the Federal government
Accessibility
Example: Apple iPhone 4 (iOS 6)

VoiceOver
- Screen reader (gesture controlled)

Zoom
- Magnify screen

Large Text
- Enlarged font size

Invert Colors
- Higher contrast

Speak Selection
- Reading highlighted text
Globalization

Localization (country / local specific)
- Adaption of an application:
  - Currency, date & time formats
  - Translation of text (language localization)
  - Graphics (incl. symbols, colors, icons)
  - Legal requirements
  - Keyboard
  - Sorting

Internationalization
- Enables easy localization (design & development process)
# Language Codes

## ISO 639-1

<table>
<thead>
<tr>
<th>Language Family</th>
<th>ISO 631-1 Code</th>
<th>Language Variant</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>en-GB</td>
<td>British English</td>
</tr>
<tr>
<td>English</td>
<td>en-US</td>
<td>American English</td>
</tr>
<tr>
<td>English</td>
<td>en-CA</td>
<td>Canadian English</td>
</tr>
<tr>
<td>Spanish</td>
<td>es-ES</td>
<td>Castilian Spanish</td>
</tr>
<tr>
<td>Spanish</td>
<td>es-MX</td>
<td>Mexican English</td>
</tr>
<tr>
<td>Portuguese</td>
<td>pt-PT</td>
<td>European Portuguese</td>
</tr>
<tr>
<td>Portuguese</td>
<td>pt-BR</td>
<td>Brazilian Portuguese</td>
</tr>
<tr>
<td>Chinese</td>
<td>zh-CN</td>
<td>Mainland China, simplified Chinese</td>
</tr>
<tr>
<td>Chinese</td>
<td>zh-HK</td>
<td>Hong Kong, traditional characters</td>
</tr>
</tbody>
</table>
Example
SAP Mobile Apps (SAP Store)

Languages:
- English, German, French, Spanish, Chinese
Globalization
Localization in iOS

Localization of Files and images
- Identifier for text in “Localizable.strings”

Code
- NSLocalizedString(@"my_title", nil);
Open Source (OS) & Third Party

Motivation

- OS standards required to avoid risks (e.g., open source use for commercial products)
- Judgment and reduction of risks (warranty, liability, quality, support, IP, laws, standard compliance)

Open Source License Model Examples

- GPL (General Public License)
- LGPL (Lesser General Public License)
- MIT (Massachusetts Institute of Technology)

“free code” ≠ “free of obligation”
Open Source
MIT License

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Open Source
Code Source Management & Approval

- Manage open source and third party code
  - Alignment with policies
- Approval management
- Reuse

Performance

Motivation
- Performance influences TCO and sustainability

KPI’s
- Response time (stable)
  - Impact on user experience and TCO
- Scalability
  - Defines hardware requirements (sizing)
  - # of: concurrent users, db objects, parallel jobs, processed objectx, servers / servers
- Transparency
  - Impact on performance improvement and awareness (mitigation planning)
Performance
Example Sizing Requirement

Resources
- CPU
- Memory
- Disk space / database size
- Frontend network bandwidth

⇒ Linear scalability
- Reproducible and measurable

![Graph showing linear scalability]

Resource consumption

users / data volume
Security

Motivation
- trustworthy secure applications (customer expectations)

Goals
- Avoid vulnerabilities
- Ensure legal requirements
- Secure architecture
- Provide data protection and privacy

Sensitive information management
- Uncritical data
- Critical data
- Secret data
Security
Example: Storage of User Data

Mobile Application
- Storage of personal data (on device)
  - Encryption
- Sending personal data
  - Secure connection
- Displaying user data
- Validated input
Best UX on iOS
SAP HANA Cloud Platform SDK for iOS
Targeted Scope

- Offer new enterprise-grade design language (Fiori for iOS)
- Access new features of new iOS versions and devices (e.g. 3D touch) – in business context …
- Leverage new technologies and languages (SWIFT, HealthKit, Apple Watch)
- Take advantage of new architecture paradigms (BaaS, PaaS,..)
- Integrate with next generation enterprise systems (S/4 HANA)
- Consume mobile services on HANA Cloud Platform
Mobile Apps
SAP Fiori for iOS Design Language

- Based on Human Interface Guidelines
- Enhanced with new reusable controls and patterns to meet robust enterprise requirements
- Makes full use of native capabilities
- Includes design guidelines for quick and accurate building of iOS apps

[https://experience.sap.com/fiori-design/]

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Fiori Mobile
Enhance experience and capabilities for mobile users

Web App

Hybrid App

Calendar
Contacts Tasks
Printing
Push
Offline
3rd party Plug-ins
Barcode
Camera
Voice Recording
GPS
Settings
LifeCycle Management
Security
SAP HANA Cloud Platform, developer edition
Free Trail

FREE
SAP HANA Cloud Platform, developer edition

Get started in a shared environment so you can quickly learn how to create cloud apps
For Non-Production Use
1 User
Shared 1GB HANA DB
Includes: Cloud Connector, Portal Service and Mobile Service


Bring Your Own Device Strategy

Bring Your Own Device (BYOD)

- Personal equipment (not business owned smartphones & tablets)
- Enterprise integration
- Company provisioning, back-end integration

Legal / tax restrictions in Europe!