What OSGi offers to mobile enterprise developers

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Objectives of this Talk

- Explain how Mobile OSGi is positioned in the market of mobile application platforms
- Explain how mobile enterprise developers benefit from using Mobile OSGi.
Scope

- Focus on mobile enterprise *application* market

Definition

- Term *Mobile OSGi* is used for
  - OSGi R4.x MEG or JSR 232 stacks
  - eRCP stacks including R4 OSGi
  - Requires J2ME CDC + Foundation Profile
The mobile enterprise market place and how Mobile OSGi fits into the picture
The Business Case: Big Time!

- Total US mobile enterprise application service revenues to grow from $9b in 2007 to $13b in 2012. [1]
- “… mobility management services revenues to grow at a CAGR of 81% through 2013 to total of $30b” [2]

Needs of mobile enterprise developers

**Application Environment**
- Portability across many platforms
- Rich UI capabilities
- Adjustable device policy
- Component & SOA model
- Enabled for middleware
- Access to device functionality

**Security**
- Secure runtime system
- Data security
- Protocol security
- Robustness

**Mobile Device Management**
- Application Lifecycle Management
- Configuration & Policy Management
- Remote Diagnostics & Assistance
- Data synchronization
- Device lock and data wipe

**Toolset**
- One IDE for mobile & non-mobile
- Leverage existing server or desktop frameworks (i.e. RCP, JMS, …)
- On-device debugging & profiling
- Device Emulation
Market Ecosystem: Complex structures

- Standardization Bodies
- SW Vendors
- Device OEM
- Operator
- Service Provider
- Enterprise
- Business User
- Private User
- App Developer
- Middleware Developer
- Aggregator
Technology Fragmentation

- **OS Platforms**
  - Symbian
    - S60, UIQ, FOMA
  - Linux
    - LiMo, LiPs, Qtopia…
  - Access
  - Win Mobile
    - <v6.1, >=v6.1
  - RIM
  - Apple iPhone
  - Google Android
  - Others

*Quarterly worldwide smartphone sales by OS vendor*

*Q3 2007*

*Q3 smartphone sales by OS vendor by region*

Source: Canalys
Technology Fragmentation, cont.

- **Application Platforms**
  - MIDP 2
  - Qualcomm Brew
  - Eclipse eRCP
  - Adobe Flash
  - Adobe AIR
  - Nokia Web Runtime
  - Yahoo Go!
  - Plain old Browser Model
  - Coming: MIDP 3
  - Coming: Sun JavaFX
  - Coming: Google Android
  - Coming: Apple iPhone

- **Remote Access Protocols**
  - OMA-CP
  - OMA-DM, SCOMO, FUMO
  - OMA-DS / Sync-ML
  - WAP-Push
  - etc.

All that combined with dimension of versions, country specifics, operator & OEMS specifics, etc. gives a HUGE combination matrix of existing runtime platforms.
Conclusion on the market space

• The Problem:
  • Broad range of advanced technical requirements
  • Very complex and rapidly changing eco-system
  • High fragmentation in available technologies
  • Huge diversity of different device configurations

• Challenges to Enterprises:
  • Selection of the right target platform(s) for their apps
  • Remote manageability of those platforms
  • Sustainability of their investments
Where Mobile OSGi fits in

By combining some of the platform elements and by making them available cross-platform, Mobile OSGi de-fragments the market!
Technical Review:
What Mobile OSGi has to offer
OSGi R4 Mobile Specification
Mobile OSGi: High Level Architecture

Native
- xyz
- JNI
- App1
- App2
- Bundle
- DP
- Java

Shell
- Xlet Cont.
- Midlet Cont.
- eSWT

Cert Store
- eRCP Cont.
- OMA-DM Client

Installer
- MIDP2
- JSRs

Handlers
- Foundation Profile

AMS
- CDC VM

Mobile OSGi
Key features of Mobile OSGi

- Component & Service model – ready for middleware
- Security model, dynamic policy model
- Support for any application model
- Remote manageability out of the box
- Java (CDC or higher) language, JNI

- It’s a standard (in case that still matters to you…)
Key feature: Compon. & Service Model

- Component based deployment model
- SOA-in-the-VM model

CLDC/MIDP 2 Process

Mobile OSGi process (always on)
Key feature: Security & Policy Model

- Security model based on Java 2
- Permissions are managed through Permission-Admin and ConditionalPermissionAdmin
- Static device policy definition mapped into dynamic model
- Device policy can be changed and tailored to the specific needs of your enterprise (provided the operator grants you that privilege)
Key feature: Multi App Model Support

- OSGi ApplicationAdmin enables different app models to map apps into the service registry
- OSGi acts as “meta container” for applications and abstracts the app model specifics
- This enables:
  - New powerful app models can be introduced, even post shipment
  - Developers can pick the model they like best
  - End users get seamless experience on the phone, one front-end to all apps, regardless their types
Key feature: Multi App Model Support, cont.

- **Eclipse eRCP / eSWT (one option):**
  - Embedded version of Eclipse Rich Client Platform (RCP) and UI Toolkit (SWT)
  - Apps inherit native application look and feel
  - Deployable to a range of devices
    - Desktops, handhelds, cell phones
    - Support for Win32, Windows Mobile, WinCE, Nokia S60
    - Future support for GTK and Qt
  - eRCP apps can also run on RCP
- **Samples available at** [www.eclipse.org/ercp](http://www.eclipse.org/ercp)
Key feature: Multi App Model Support, cont.

- New App models will emerge: Server in the Pocket
Key feature: Remote Management

- Concept of management domains

Mgmt Server
- **Device** mgmt
- Provisioning

Your Enterprise

Mgmt Server
- **App** mgmt
- Provisioning
- Configuration
- Support

Source: Sprint Titan Slides
Remote Management: Domains

**Operator**
- Device provisioning
- Network provisioning
- Application provisioning

New with Titan:
- Remote customer care
- Trouble shooting
- Config Mgmt

**Your Enterprise**
- Application provisioning
- Application life-cycle
- Configuration Mgmt
- Remote & local Monitoring
- Remote Support

Source: Sprint Titan Slides
Remote Management: OMA-DM & DMT

- In OMA-DM, all device capabilities and data points are kept in a tree like structure, the Device Management Tree (DMT).
- OSGi has defined DMTs for many functional areas:
  - Application life-cycle management
  - Log Service & Monitoring
  - Configuration Admin
  - Policy Management
- Developers can extend the DMT with their own subtree. Extensions can be deployed on the fly!
- Fine grained security concept by ACL for each tree node. Use case: operators can grant enterprises partial access to the DMT
Remote Management: Management Tree

- OMA-DM Mobile Device Mgmt Server
  - Native OMA-DM Client
    - Native DMT
  - Java OMA-DM Client
    - Mobile OSGi DMT
  - Mobile OSGi
    - Your Custom DMT Extension Bundle(s)
    - Option: Your Custom Management Agent
Remote Management: OMA-DM Message

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  <SyncHdr>
    <VerDTD>1.2</VerDTD>
    <VerProto>DM/1.2</VerProto>
    <SessionID>11a76b4234a4</SessionID>
    <MsgID>35</MsgID>
    <Target>
      <LocURI>dancho-006</LocURI>
    </Target>
    <Source>
    </Source>
  </SyncHdr>
  <SyncBody>
    <Status>
      <CmdID>1</CmdID>
      <MsgRef>35</MsgRef>
      <CmdRef>0</CmdRef>
      <Cmd>SyncHdr</Cmd>
      <Data>212</Data>
    </Status>
    <Sequence>
      <CmdID>2</CmdID>
      <Add>
        <CmdID>3</CmdID>
        <Item>
          <Target>
            <LocURI>/OSGi/Deployment/Download/ISEL0QGUZJ</LocURI>
          </Target>
          <Meta>
            <Format xmlns='syncml:metinf'>node</Format>
          </Meta>
        </Item>
      </Add>
      <Replace>
        <CmdID>4</CmdID>
        <Meta>
          <Format xmlns='syncml:metinf'>chr</Format>
          <Type xmlns='syncml:metinf'>text/plain</Type>
        </Meta>
        <Item>
          <Target>
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          </Target>
          <Data>http://localhost:9090/syncml-dl/BIDFHAG1ISR</Data>
        </Item>
        <Item>
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          </Target>
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        </Item>
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        <Item>
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          </Target>
          <Meta>
            <Format xmlns='syncml:metinf'>node</Format>
          </Meta>
        </Item>
      </Exec>
    </Sequence>
  </SyncBody>
</SyncML>
```
Key feature: Java Language

- Best chance of cross-platform portability of applications – CDC/FP provides the base
- Leveraging Java programmer resources
- Most advanced runtime for business logic
Technical Review: How OSGi compares to other technologies
Needs of mobile enterprise developers, revisited

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- Contained in Mobile OSGi
- Agnostic in Mobile OSGi
Mobile OSGi Tooling Support provided by Sprint

Development Host

Eclipse IDE
- J9 Launcher
- I/F Stack
- DP Editor
- ProSyst JProfiler
- Remote Mgmt Plugin

WM Emulator
- Titan Runtime

OMA-DM Server Console

OMA-DM Stack
- Instrumentation Agent
- Profile Agents
- Local Console
- OMA DM Stack

Target Device

DM Server Host

OMA-DM Server

SW Repository
Does Mobile OSGi solve all your problems? No!

- Still it can’t be run on all devices
  - CDC/FP=3MB + OSGi=1.2MB + Service=1.3MB = Total=5.5MB
  - eRCP/eSWT + simple app adds another 3MB
- It does not present a UI story by itself
  - App models depend on UI toolkits
  - UI toolkits might not be available across all platforms
- Integration of CLDC based component JSRs into CDC is a challenge
- Mobile OSGi not yet available on all platforms
- Very little market penetration at the moment but that will change soon (refer to Sprint Titan)
Next Steps!
Try it out!

- Sprint offers a complete Mobile OSGi stack for download (WinMobile based):
  - http://developer.sprint.com

Comes with a complete set of Eclipse based tools for plugin development, DP editing, deployment, remote debugging and profiling.

Documentation, Videos