Using OSGi for the Realization of Home Automation Systems
OSGi Evolution

Focus: Residential
Extending the scope: Automotive
Extending the scope: Mobile
Extending the scope: EEG and REG

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<th>R1</th>
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<th>R4.1</th>
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Focus:
- Residential
- Extending the scope: Automotive
- Extending the scope: Mobile
- Extending the scope: EEG and REG

Changes:
- R1: 2000
- R2: 2001
- R3: 2003
- R4: 2005-2006
- R4.1: 2007
- R4.2: 2009
The residential area is currently one of the most promising application fields of OSGi. Why?
Technical Reasons

• The benefits of Java (acceptance, safe programming, multi platform, multi language, etc.)
• The dynamic module system for Java™ (reduced complexity, reusability, dynamic, isolation)
• Availability of OSGi implementations (mature, well tested, also such with clear embedded focus)
• Many useful services needed in residential boxes are specified and implemented
• Various residential protocols such as Zigbee, ZWave, UPnP, KXN, etc. are supported
• SDKs and other convenient development tools available
Strategic Reasons

• Many Telcos are very interested to open their broadband boxes for additional services
• Well coordinated efforts of several standardization organizations (OSGiA, BBF, HGI, UPnP)
• OSGi considered the most suitable Execution Environment
• Convergence processes (e.g. FMC). Chances for using a unified service platform
• OSGi provides improved manageability of the residential boxes
Reference Architecture

- UPnP, ZigBee, KNX, etc.
- IP (UPnP, DLNA...)
- ZigBee
- Z-Wave
- KNX / EHS
- etc.

OSGi and HGI

- End User Client Devices
- Broadband Forum
- Management Protocol

ISVs & Service Providers
- Service Backend
- End User Portal
- ISV Portal
- App Store Infrastructure
- OSS/BSS Infrastructure
- App Lifecycle & Remote Management Infrastructure
- Carrier Infrastructure

Mobile/PC/Mac
Home Application Examples

**Home Security**
- Intrusion Alarm
- Home Monitoring
- Fire Alarm & Protection
- Attendance Simulation
- Door Entry Authorization
- Panic Assistance

**Home Automation**
- Home appliance control
- Automation appliance control (heating, blinds)
- Facilities Control System
- Energy Metering

**Family Care**
- Internet Usage Tracker
- Child / Elder Monitoring
- Health Data Transmission
- Pet Feeder
- Ambient Assisted Living

**Infotainment**
- Multimedia Content
- A/V on Demand
- Network Gaming
- Social Networking
- Education Services

**Other Services**
- Location Based Services
- Digital Photo Frame
- Conferencing
- VoIP & Multimedia
Using OSGi as EE in HG

Those horizontal components are not specified by OSGi yet!
Important Design Issues

• How to abstract the device layer?
  – Interfaces
  – Device ontology

• How to realize the automation layer?

• How to export the provided device interfaces (for GUI, remote management, ... distributed services, etc.)

• How to handle the configuration?
Home Device Manager

[Diagram showing the relationships between resident devices, browsers, OSGi framework, Home Automation Application, ProSyst Home Device Manager, HomeDevice types, DeviceClasses, and Home Systems]
Home Automation Manager
Configuration Management
Summary

• There is a strong case for using OSGi as enabler for providing residential services/applications
• This development is supported by the progress at several standardization efforts
• There are commercially available software products which can facilitate and significantly simplify the usage of OSGi in this area
Thank you!

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