Thomas Hott | ProSyst

App Store for Connected Home Services
Home Application Enablement

• Successful mobile app stores demonstrate that there is tremendous value in the application enablement channel.

• Broadband carriers around the world have started to invest into enabling home applications, thus fueling the evolution towards the fully connected digital home.

• This presentation describes the business case for application enablement and suggests an implementation strategy, leveraging industry standards and truly open technologies.
Connected Home Evolution

- Better user experience
- Hardware synergies
- Quality of Service
- Market responsiveness
- Quantity of home services

- Rapid innovation cycles
- Leverage 3rd party service
- New business models
- Diversity of applications
App Store Ecosystem

- Other HW OEM
  - Reach
  - SDK
  - Billing

- ISV
  - Apps

- Service Provider
  - SaaS
  - Phys. Services

- HGW OEM
  - HGW
  - Billing

- Carrier
  - Access
  - Billing
  - Services

- Marketplace Provider (white label)
  - Apps
  - Services
  - Content Discovery

- 3rd Party Innovation Tier
- Enablement (Channel) Tier
- Consumer Tier

End User
Business Model of Open System

Revenue
- App retail
- Service subscriptions
- Payment gateway revenue
- Advertising
- Incremental data usage

Operational Cost
- Less equipment in the field
- Just 1 OSS/BSS
- Synergies b/w applications

Subscribers
- Value adding services boost competitive advantage
- Less churn
- Attracts new subscribers

Reach
- Carrier owns control point (Residential Gateway) in the home
- Access to many screens
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 (heatings, blinds, sensors, ...)
- Facilities Control System
- Energy Metering
- ...

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

Infotainment
- Multimedia Content Management
- A/V on Demand
- Network Gaming
- Social Networking
- Education Services
- Commerce Services
- Convenience Services
- ...

Other Services
- Location Based Services
- Digital Photo Frame
- Conferencing
- VoIP & Multimedia
- ...

Own the Home Gateway!

• More value is in Applications and Services, less in broadband access

• Residential Home Gateway (HGW) turns into open App and Service platform, thus into the central control point in the home

• Capturing value from Apps and Services requires controlling the HGW and providing a channel

• HGW must be open for new 3rd party apps, thus implement industry standards (OSGi, TR69, ...)
Eco System Architecture

- **App & Service Providers (ISV, SP, Carrier)**
  - Service Creation
  - Downloadable or hosted apps and services

- **Application Store Provider (e.g. Carrier)**
  - Service Aggregation
  - End user portal for app & service subscriptions

- **Application Life Cycle Manager (e.g. Carrier)**
  - Service Delivery
  - Infrastructure for managing, supporting, billing of apps & services

- **End Consumer**
  - Service Consumption
  - Open residential service gateway wired to sensor & media devices
OSGi: Enabling the Eco System

ISVs / Developers

Publish Apps

Provide SDK

App Store

Distribute

Search

Consumer Device

Execute

Develop
OSGi: Enabling the Eco System

**Develop**
- ISVs / Developers

**Publish Apps**
- App Store

**Distribute**
- Consumer Device

**Search**

**Execute**

**Provide SDK**

**OSGi Benefits:**
- Standardized programming & deployment model
- Existing OSGi tools & SDKs
- Existing developer community
- Existing components
- Existing know-how

**OSGi Benefits:**
- Built-in SW Lifecycle Management Capabilities
- Existing OSGi Remote Management Servers

**OSGi Benefits:**
- Standardized Runtime Execution Environment (OSGi Framework)
Conclusion

• Evolution towards fully connected home creates end-user demand for new value adding apps & services

• Carriers & OEMs can capture value by opening their user channel

• For this eco-system to flourish a technology platform is required

• OSGi is the ideal choice: Proven, standardized, scalable
Thank you!

...and please feel free to contact us at any time!

Daniel Schellhoss
Executive VP
+ 49 221 6604-203
d.schellhoss@prosyst.com

www.prosyst.com
Need for the Right Tools
SDK Structure

ProSyst mBS SDK
- Eclipse Plugins
- OSGi Runtime
- OSGi Validator

Collection of Eclipse IDE Plugins, simplifying development of OSGi devices or OSGi contents

ProSyst mBS, the carrier grade, highly optimized OSGi R4.2 runtime for embedded devices

Tools for validating functional & non-functional conformance of your OSGi platform
OSGi Device Development

Product Development

Purpose:
- Embedding OSGi into device
- Create OSGi
- Preload Content

Used by:
- OEM/ODM
- ISV

After Market

Device
OSGi Device After Market

**Product Development**

**After Market**

- **Purpose:**
  - Create generic OSGi Postload Content

- **Used by:**
  - OEM/ODM
  - Selected ISV

---

**ProSyst mBS SDK**

- Eclipse Plugins
- OSGi Runtime
- OSGi Validator
SDK Variants

OSGi Tools for OSGi device or generic OSGi content developers

Off-the-Shelf Product

ProSyst mBS SDK

- Eclipse Plugins
- OSGi Runtime
- OSGi Validator

White Label OSGi Device SDK

OSGi Device SDK for 3rd party developers, published by OEM or Carrier

- Customized Eclipse Plugins
- Customized OSGi Runtime
- Target Device Emulator
- App Store Integration
# Eclipse Plugins

<table>
<thead>
<tr>
<th>Plugin group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mToolkit</td>
<td>Includes a collection of convenient tools for deployment and management of OSGi-compliant bundles on OSGi Runtimes straight from within the Eclipse Workbench.</td>
</tr>
<tr>
<td>mBProfiler</td>
<td>Assists developers in improving the efficiency of applications by exploring different aspects of the performance of a Java program, associated with JVM’s consumption of the available platform resources (CPU, memory and threads).</td>
</tr>
<tr>
<td>System plugins</td>
<td>Offers a set of supplementary features assisting developers in constructing applications for concrete images of mBS</td>
</tr>
</tbody>
</table>
mBProfiler Plugin

• Memory consumption measurement
• Memory stack frames tracing
• CPU loads profiling
• Momentary heap allocation information
• Thread state progress statistics
• Tracking the stack traces of active threads and the monitors they use.
• Garbage collection during profiling
• Remote profiling
mToolkit Plugin

• Manage OSGi environments on remote devices including bundle installation and update, examination of the installed components in a tree–like manner, etc.

• Model and build OSGi Runtime images that best fit the requirements of the target device platform.

• Launch the OSGi Runtime on target device in normal, debug and profile mode.

• Provides OSGi Runtime emulation on developer’s PC and allows work in normal, debug and profile mode.

• Ease the code sharing by utilizing the mPRM software repository directly from Eclipse IDE. Users can add bundles to the Eclipse Target machine or upload bundles from a PC.
mBProfiler Plugin

- Memory consumption measurement
- Memory stack frames tracing
- CPU loads profiling
- Momentary heap allocation information
- Thread state progress statistics
- Tracking the stack traces of active threads and the monitors they use.
- Garbage collection during profiling
- Remote profiling
System Plugins

• Target Platforms Store – adds to the Eclipse Plug-in Development Environment a bunch of target platforms holding the APIs and services available in the OSGi Runtime.

• Target Image Descriptors – represent a set of pre-defined OSGi Runtime images containing the functional components for the most typical production use cases. Developers can use the image descriptors to generate a ready runtime and deploy it on devices, to emulate a runtime on a PC or to design own images based on the pre-defined ones.

• J9 JRE Plug-in – installs in Eclipse a J9 2.4 JVM fully compliant with the J2ME CDC Personal Profile 1.1. to be used as an execution environment and, for emulation.
OSGi Validator

- OSGi infrastructure for simple, automated execution of test cases and validation code
- Automated compilation of validation reports
- Can be applied to validate
  - Functional behavior
  - Platform Performance
  - Platform Stability
White Labe SDKs

• For OEMs or Carriers planning to open up an OSGi based device to the public developer community
• Enables the developer community to create OSGi content for a dedicated device
• Branded and published by OEMs or Carriers
• Based on ProSyst‘s leading OSGi SDK offering
White Label SDK

• May contain feature such as:
  - Eclipse plugins for OSGi development
  - Target device runtime definition for Eclipse, containing the exact device APIs
  - PC or Mac based emulation and simulation environment for the target device
  - Integration with the OEMs or Carriers app store
  - Documentation, References, Samples