HOW DEUTSCHE TELEKOM DELIVERS A MASS MARKET PRODUCT BASED ON ECLIPSE SMARTHOME

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WHERE WE STARTED . . .
PLATFORM LAUNCH IN OCTOBER 2013

- Home Gateway
- Based on commercial Java/OSGi products
- CVM (Java 1.4), OSGi R4.2
- Launch JavaSE Embedded 7!
- HomeMatic (builtin)
- ZigBee HA 1.2 (stick)
PARTNER PRODUCTS LAUNCHED IN OCTOBER 2013
WHAT WE LEARNED...

- APIs provided are too complex
- Developing “drivers” for SmartHome devices is painful
- Developing for embedded gateways needs special considerations (performance, footprint)
- Update process is complex, needs careful OSGi bundle implementations
INTRODUCING ECLIPSE SMARThOME - A TIMELINE

- **2013-08-21**: ESH proposal (based on openHAB 1)
- **2013-11-15**: ESH project setup
- **2014-Q1**: Decision to integrate ESH in QIVICON
- **2014-06-23**: Contribution of Things/Channels
- **2015-Q1**: First rollout in QIVICON, incl. Hue binding
CHALLENGES DURING INTEGRATION

- Simplify binding development
- Add APIs for device integration/configuration (Thing/Channel concept)
- Configuration UI missing
- APIs instead of DSLs, avoid xText in runtime
- Target for smaller embedded gateways (RaspPi1 class)
- Running with Security Manager
<table>
<thead>
<tr>
<th>REST API</th>
<th>ONEM2M</th>
<th>3RD PARTY EMULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RULE ENGINE</td>
<td>VOICE ENABLING</td>
<td>PERSISTENCE</td>
</tr>
<tr>
<td>MODULES</td>
<td>TEMPLATES</td>
<td>MEMORY</td>
</tr>
<tr>
<td>TEXT-TO-SPEECH</td>
<td>SPEECH-TO-TEXT</td>
<td>LOCAL</td>
</tr>
<tr>
<td>HUMAN LANGUAGE</td>
<td>PERSISTENCE</td>
<td>CLOUD</td>
</tr>
<tr>
<td>ECLIPSE SMARTHOME CORE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THINGS / BINDING API</td>
<td>UPNP</td>
<td>MDNS</td>
</tr>
<tr>
<td>PROTOCOL SUPPORT</td>
<td>MQTT</td>
<td>SERIAL</td>
</tr>
<tr>
<td>DISCOVERY SERVICE</td>
<td>PROTOCOL BINDING</td>
<td>PRODUCT BINDING</td>
</tr>
<tr>
<td>CLOUD BINDING</td>
<td>SUB-SYSTEM BINDING</td>
<td></td>
</tr>
</tbody>
</table>

Extension Points
# Eclipse SmartHome Architecture

## Eclipse SmartHome Core

### Things / Binding API
- UPnP
- MDNS
- MQTT
- Serial
- Protocol Support

### Eclipse SmartHome Modules
- Modules
- Templates
- Text-to-Speech
- Speech-to-Text
- Human Language
- Memory
- Local
- Cloud
- Widgets
- Icon Sets
- Chart Engine

### Eclipse SmartHome Sub-System Binding
- Discovery Service
- Protocol Binding
- Product Binding
- Cloud Binding
- Sub-System Binding

### Extension Points

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EXTENDING HOME GATEWAYS – WE STARTED WITH

- Home Base v1
- Single-core ARMv6
- 512 MB Ram, 2 GB Flash
- HomeMatic built-in
- ZigBee HA 1.2 via USB stick
EXTENDING HOME GATEWAYS – UPDATED VERSION IN 2016

- Home Base v2
- Dual-core ARMv7
- 512 MB Ram, 512 MB Flash
- WiFi, Bluetooth builtin
- DECT ULE, HomeMatic, Homematic IP, ZigBee builtin
EXTENDING HOME GATEWAYS – FIRST ROUTER INTEGRATION

- Speedport Smart
- Dual-core ARMv7
- 512 MB Ram, 512 MB Flash
- Resources split between Router/QIVICON (50%)
- WiFi, Bluetooth, DECT built-in
- Homematic IP, ZigBee (stick)
ARCHITECTURE ECLIPSE SMARThOME AND QIVICON

Partner applications

Eclipse SmartHome / QIVICON APIs

OSGi Framework: OSGi R4.2

JVM: JavaSE Embedded 7

OS: Linux
JAVA UPDATES

- Partner applications
- Eclipse SmartHome / QIVICON APIs
- OSGi Framework: OSGi R4.2
- JVM: JavaSE Embedded 7
- OS: Linux

- CVM until 2013 😞
- JavaSE Emb. 7u21, 45, 71
- JavaSE Emb. 8 (01/2018)
- Versions 8u60, 73, 131
- Compact profiles 2, 3
- Extensions (Nashorn, …)
- glibc, ucLibc
- Java for MIPS planned
OSGi Updates - Not Yet

- OS: Linux
- JVM: JavaSE Embedded 7
- OSGi Framework: OSGi R4.2
- Eclipse SmartHome / QIVICON APIs
- Partner applications

- OSGi R4.2 commercial framework, incl. compendium bundles
- DS compile time annotations introduced
- OSGi >=R5 needs bigger migration of customer installations
MAJOR CONTRIBUTIONS FROM COMMERCIAL PRODUCT

- Things concept, Firmware Update, Config Descriptions, Paper UI
- Core Eventing
- Optimizations: Jersey REST, Compact 2 profile
- Enhance I18N capabilities (multiple languages)
- Bindings: Philips Hue, Weather, Sonos
- Joint work on: jUPnP, jmDNS, OSGi-JAX-RS-Connector
INTEGRATION FROM ECLIPSE SMARTHOME INTO PRODUCT

- PRs are done mostly direct on OpenSource
- Complex functions are discussed OpenSource and prototyped internally
- ESH Master goes into QIVICON Master all 2 weeks
- No fork of ESH, intermediate changes/compatibility due to API breaking changes
- Additional testing, especially lifecycle (update)
COMMERCIAL EXTENSIONS OF ECLIPSE SMARTHOME (EXCERPT)

- Easy configuration, discovery/pairing, config UIs
- Secure Remote Access
- Camera support with secure streaming: local, via cloud
- Cloud storage integration for camera streams
- Sound API for speakers
- Run with Security Manager in restricted sandbox
- Push Notifications to SmartPhone apps
THE TEAMS AND CONTRIBUTORS

OpenSource Team
- Community
- Reviews, PRs
- Core Framework extensions

Runtime Team
- OSGi framework, DS, Lifecycle, Libraries
- REST, jUPnP, jmDNS
- Tools, CI/CD

API Team
- Things
- Configuration
- Firmware Update
- HomeMatic, ZigBee

Binding Team
- OpenSource bindings
- Commercial bindings
THE TEAMS AND CONTRIBUTORS (INTERNAL, EXTERNAL PARTNERS)

OpenSource Team
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- Vi Toni
- amitjoy
- Alex Tugarev
BIG THANKS TO
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Magenta SmartHome

Alarm System
Remote Control
House sitter
Notifications
Situations, Rules

Source: https://www.smarthome.de/
THANK YOU!

Jochen Hiller, Deutsche Telekom AG