Operators define “service” differently than OSGi specifications define “service”

- A “service” to an Operator is something a service subscriber can pay for, an end-to-end service like “Voice” or “Broadband” or a service feature like “Call-Waiting” or “Call-Forwarding”

- The definition of a “service” within OSGi Service Platform specifications is generally a much smaller thing. It’s the advertised interface to a software Lego® block (in an OSGi bundle), “…A service is a normal Java object [a POJO] that is registered under one or more Java interfaces within the [OSGi] service registry…”

- Formal OSGi definition: “Service – An object registered with the service registry under one or more interfaces together with properties. This object can be discovered and used by bundles.”

*On the following slides, we will use the term “service” as defined by operators*
Today’s challenges in the cross-industrial world

In the face of increasing consumer requirements and expectation, service providers need to:

• Create new, revenue-generating personalized services
  • Extend the network to sensors to offer new services, including monitoring and management of personal health
• Offer added value to the end user to differentiate from competitors
• Re-use existing service elements to offer more complex services
  • For example, the call waiting and call forwarding service elements could be packaged in your calling plan
• Improve ease-of-use for the consumer
• Reduce time to market
• Reduce cost of ownership
### Shifts in Mobile Operators’ Value Chain

<table>
<thead>
<tr>
<th>Customer</th>
<th>New Mobile Value Chain</th>
<th>Technology</th>
<th>Comment</th>
</tr>
</thead>
</table>
|          | Content/application providers | Webservices | OSGi helps operators:  
- Avoid becoming a “bit-pipe”  
- Handle transition from “walled garden” to open Internet  
- Compensate decline in voice traffic with growth in data |
- +40% Data revenue\(^2\) (€1.9B)  
- +8.4% Other revenue (€ 32.8B) |
|          | Network/service operators | Mobile broadband | |
|          | Device manufacturers | More powerful devices | |

---

1 In the T-Mobile countries: Germany, USA, UK, Netherlands, Austria, Czech Republic, Poland, Hungary, Slovakia, Croatia, Macedonia, Montenegro
2 Not including SMS

After: The War of the Mobile and Internet Worlds: Regulations and Corporate Players; Jarkko Vesa; ESCP-EAP 2007
Technical "to-dos," possibilities with technology stack layers

<table>
<thead>
<tr>
<th>Technology Layer</th>
<th>Key Operator Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Facilitate new operator-enabled services.</td>
</tr>
<tr>
<td>Presentation Layer</td>
<td>Deliver a unique and consistent user experience and operator enabling capabilities.</td>
</tr>
<tr>
<td>Execution Environment</td>
<td>Manage the complexity of multiple HW platforms, services.</td>
</tr>
<tr>
<td>Operating System</td>
<td>Support QoS.</td>
</tr>
<tr>
<td>Backend Systems</td>
<td>Build a new infrastructure for innovative services.</td>
</tr>
<tr>
<td>Network</td>
<td></td>
</tr>
</tbody>
</table>
Differentiation

OSGi technology can play a role here

### Key Operator Challenges

- **Facilitate new operator-enabled services.**
  - Register and expose APIs for 3rd party developments in an OSGi Service Framework

- **Deliver a unique and consistent user experience and operator enabling capabilities.**
  - Deployment, customization, management of services, and lifecycle management to optimize offers for the customer

- **Manage the complexity of multiple HW platforms, services.**
  - Java based service framework abstracts OS and HW and enforces SOA based architectures

- **Support QoS.**
  - Deployment of OSGi Bundles to bridge incompatible QoS schemes to ensure end-to-end QoS

- **Build a new infrastructure for innovative services.**
OSGi offers opportunities for strategic market differentiation

**New business models**
- Creation of flexible new business models
- Service aggregation through use of pluggable service elements
- Extend current offerings with innovative services
- Open to third-party providers and developers

**Deployment of new services**
- Rapid development and deployment of new services
- Customized product variations that meet diverse customer needs
- Leverage an established OSGi ecosystem to jumpstart
  - Re-use of modular components

**OSGi Technology enables**
- Continuous after-sales and maintenance
- Efficient cooperation with first-tier providers and after-market sales
- Product configuration at any point in time
- Ability to diagnose, start-stop-update and install/remove services remotely
- Remote maintenance/dynamic update

**Maintenance**
- Dynamic download, maintenance and removal of selected components

**Support for end-users**
- Easier installation, upgrade, and removal of services with no downtime
- Enables automatic upgrades
- Simplifies end-user maintenance

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Rapid development and deployment of new services reduces time to market

<table>
<thead>
<tr>
<th>Easy product creation</th>
<th>Reduce deployment effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Customized product variations that meet diverse customer needs</td>
<td>▪ Portable across H/W platforms and software OSS (Operations Support Systems)</td>
</tr>
<tr>
<td>▪ Leverage an established OSGi ecosystem to jumpstart telco solutions (tools, libraries, system integrators, applications, etc.)</td>
<td>▪ Needs only partial deployment - available components are reused</td>
</tr>
<tr>
<td>▪ Re-use of modular components</td>
<td>▪ Hot deployments</td>
</tr>
<tr>
<td>▪ Develop future-proof products with extended life cycle without retrofit - decrease in expensive recalls</td>
<td>▪ Common provisioning formats</td>
</tr>
<tr>
<td>▪ Ability to use freely available application development tools</td>
<td>▪ Dynamic software downloads</td>
</tr>
<tr>
<td>▪ Leverage 3rd party developers</td>
<td></td>
</tr>
</tbody>
</table>

Reduced time-to-market
Consumer satisfaction increases with better aftermarket sales and field maintenance

Strategic market differentiation

- Better aftermarket sales and field maintenance through easier service provisioning and aggregation
  - Efficient cooperation with first-tier providers and after-market sales
  - Product configuration at any point in time
  - Ability to diagnose, start-stop-update and install/remove services and applications remotely
  - Integration of “n” devices for seamless service delivery and maintenance; outreach to new markets
  - Remote maintenance and dynamic SW update
    - Establish and change configuration parameters for services
    - Low-cost maintenance
    - Enabling remote management with standard remote management protocols
  - Improve ease-of-use for the consumer

Continuous aftermarket sales
Reduced operating costs
Enabling seamless service availability across networks

- Ability to aggregate services from multiple providers
- Service Provider Servers
- Internet
- Mobile Networks
- Building Automation & Control Networks
- Access Network
- Tunable security mechanism
- Increase profits for network usage by enabling network traffic optimization
- Portability across multiple service platforms & hardware
- Enable fixed-mobile convergent services
- Easier product management & diagnostics in the field
- Business Development
- Increase profits for network usage by enabling network traffic optimization
- Building Automation & Control Networks
- Access Network
- Tunable security mechanism
- Internet
- Service Provider Servers
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- Increase profits for network usage by enabling network traffic optimization
Conclusion
Conclusion

OSGi Delivers:

- Applications and infrastructure that are always fit-for-purpose without excess
- More than 10 years of maturation of one of the first true SOA technologies in the market
- The 7/24 capabilities that can be provided by the industry’s only standardized fully dynamic / hot-pluggable component system
- A growing ecosystem to extend service providers’ business
  - Potential partners and customers including white good and CE manufacturers, utility providers and app developers
  - New value-added services on existing infrastructure via OSGi chips, gateways, computers, routers, etc.
Getting Started with OSGi

- About OSGi Alliance and its technology
  [http://www.osgi.org/Technology/WhyOSGi](http://www.osgi.org/Technology/WhyOSGi)
- Learn more about OSGi technology now
  [http://www.osgi.org/Technology/HowOSGi](http://www.osgi.org/Technology/HowOSGi)
- OSGi Application Framework
- And the people driving the revolution
  [http://www.osgi.org/WG/ HomePage](http://www.osgi.org/WG/HomePage)
- And join in
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