Managing Complexity in Mobile Application Deployment Using the OSGi Service Platform

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Managing Complexity in Mobile Application Deployment

Agenda

• Mobile Application Architectures
• Deployment Issues
• Managing Mobile Application Deployment
• Mobile Application Deployment Using the OSGi Platform
• Conclusions
# Mobile Application Architectures

<table>
<thead>
<tr>
<th>UI Rendering</th>
<th>Presentation Logic</th>
<th>Business Logic</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Browser</td>
<td>• Declarative (e.g., JSP, ASP)</td>
<td>• Business objects (e.g. EJB, Corba)</td>
<td>• Structured data (e.g., SQL data)</td>
</tr>
<tr>
<td>• Managed code</td>
<td>• Programmatic (e.g., Servlet, CGI)</td>
<td>• Services (e.g. Web services)</td>
<td>• Unstructured data</td>
</tr>
<tr>
<td>• Native code</td>
<td></td>
<td>• Information Servers (e.g. Mail, Calendar)</td>
<td>• Documents</td>
</tr>
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<td></td>
<td></td>
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<td>• Multimedia</td>
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Online Web Mobile Application

UI Rendering
- Browser

Presentation Logic
- Declarative (e.g., JSP, ASP)
- Programmatic (e.g., Servlet, CGI)

Business Logic
- Business objects (e.g., EJB)
- Services (e.g., Web services)
- Information Servers

Data
- Structured data (e.g., SQL data)
- Unstructured data
- Documents
- Multimedia

Pros:
- Easy to deploy; no client code
- Full-featured applications and real time data
- Better security due to well known protocols (wtls,https,..)

Cons:
- Network latency and coverage can impact usability
- Devices may support different mark up languages
- Limited capability user interface
Online Native Mobile Application

UI Rendering
- Native Graphics

Presentation Logic
- J2ME/C# app
- C/C++ app

Business Logic
- Business objects (e.g., EJB, Corba)
- Services (e.g., Web services)
- Information Servers

Data
- Structured data (e.g., SQL data)
- Unstructured data
  - Documents
  - Multimedia

Pros:
- Usually better user interface
- Full-featured apps and real time data

Cons:
- Network latency and coverage can impact usability
- Need to provision, install, update apps
- Security of data in transit is a concern

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Offline Mobile Application

<table>
<thead>
<tr>
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<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Native Graphics</td>
<td>• J2ME/C# app</td>
<td>• Subset of business logic</td>
<td>Structured data (e.g., SQL data)</td>
</tr>
<tr>
<td>• Browser</td>
<td>• C/C++ app</td>
<td>• Subset of data</td>
<td>Unstructured data</td>
</tr>
<tr>
<td></td>
<td>• JSP/ASP</td>
<td>• cached</td>
<td>• Documents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• synchronized</td>
<td>• Multimedia</td>
</tr>
</tbody>
</table>

Pros:
• Usually better user interface
• Less sensitive to network latency and coverage

Cons:
• Need to provision, install, and update apps
• Data synchronization is difficult
• Security of stored data and data in transit

Wireless Medium

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Mobile Application Deployment Issues

System Issues
• Scalable, secure, available system configuration

Administrative Issues
• Device provisioning
  – Data center or self service
  – Parameter, application, and data provisioning
• Device Management
  – Application and data installation and update
  – Remote diagnostics and repair
  – Remote lockdown

Usage Policy Training
Managing Mobile Application Deployment

- Understand your users and set the right expectations
  - Mobile experience is not the same as desktop experience
- Understand your system behavior
  - Scalability
    - Publish expected response times during hours of operations
  - Device, network, and server capacities and limitations
    - Avoid OTA downloads of large amounts of data and apps
  - Security Vulnerabilities
    - Assume that the device will be lost or stolen
- Centralize the administration as much as possible
  - The more the user does admin => the more the problems
  - Centralize application and data provisioning, install, update
  - Remote diagnostic, repair and lockdown
- Consider a mix of mobile application architectures
  - Offline apps more usable but more difficult to manage

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Deployment Using the OSGi Platform

Issues with Current OSGi Deployment Technology

- Each enterprise or operator must write its own management bundle (programmatic); declarative approach needed.
- Bundle upgrade is all or nothing; incremental update of bundle needed
- Support needed for server initiated communication via SMS
- API to collect pertinent device information; locking down devices
Conclusions

• Mobile experience is different from desktop
  – Design apps with device and network constraints in mind
  – Online apps are less usable but easier to deploy
  – Disconnected apps are more usable but difficult to deploy
  – Mobile applications create additional security challenges

• Mobile applications deployment requires centralized
  – Parameter provisioning
  – Application and data provisioning
  – Application install and upgrade
  – Remote diagnostics, repair, and lockout

• OSGi Spec is the only standard for deployment
• OSGi MEG starting to address the deployment issues
• JSR 232 and OMA DM protocol will lend credibility