ArcGIS Server for the Java Developer

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Agenda

- Quick Introductions
- A Java Developer’s Overview
- Extending ArcGIS Server
- Extending the existing Java EE infrastructure
- Building client applications
- Summary
- Q & A
Overview

Eric Bader
ArcGIS 10 — A Complete System

Many opportunities for Java developers...

• Discover
• Create
• Manage
• Visualize
• Analyze
• Collaborate

The System is Extensible and Integratable
ArcGIS 10 — A Complete System

Many opportunities for Java developers…

The System is Extensible and Integratable
Java and ArcGIS

More...
Keep in mind

- Know what it is you are building
- Know the differences between the Java Esri SDKs
Extending ArcGIS Server with Custom Web Services

Ajit Dharmik
Extending ArcGIS Server

- Web Clients
- Android
- Java SDKs
- Web Services
- Java SOEs
- Cloud
- Enterprise
- Local
Why extend ArcGIS Server?

- **Server Objects (SOs)**- coarse grained objects
  - Provide access to data and analysis
  - Map, GP, Image

- **Services are based on SOs**
  - Map service, GP service, Image service

- **SOs have generic capabilities**

- **If more capabilities are required**, extend SO
Server Object Extensions

- ArcObjects based
- Extend Map Service only
- Exposed via SOAP and REST
- Inproc access to map service’s layers
- Customizable startup and shutdown behavior
- Access to map service logs
Other ways to extend Server

- Geoprocessing tools

<table>
<thead>
<tr>
<th>SOEs</th>
<th>GP</th>
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<tr>
<td>Solution only for Server</td>
<td>Solution for all Engine, Desktop, Server</td>
</tr>
<tr>
<td>No runtime overhead</td>
<td>Runtime overhead for GP initialization and input/output data validation</td>
</tr>
<tr>
<td>Complete control over information exchanged with client (for REST SOEs)</td>
<td>Clients must send info to service via gp data types.</td>
</tr>
<tr>
<td>Software development required</td>
<td>Software development required only if custom tools are needed</td>
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• Demo
ArcGIS Resource Center

ArcObjects SDK 10 Java Platform

Server Object Extensions

A Server Object Extension (SOE) extends the ArcGIS Server functionality. It can be used to enhance the capabilities of ArcGIS Server by providing additional features and services.

ArcGIS Manager

Capabilities
- Mapping (always enabled)
- KML
- Feature Access
- WMS
- WFS
- WCS
- Network Analysis

Capabilities:
- Hello World SOE
Working with ArcGIS Server
Java Web Services (AgSJWS)
Extending the Java EE Infrastructure…

- Cloud
- Web Clients
- Android
- Java SDKs
- Web Services
- Enterprise
- Java SOEs
- Local
- Desktop
- Mobile
- Web
WebService Clients and API's

ArcGIS Server API (ArcObjects)

ArcGIS Java Web Services API (SOAP)

ArcGIS Server REST API
SOAP Web Services

- Easily accessible from Java, .NET, Python, etc.
- Cross Platform support, Windows/Linux
- Standard Object Orientated programming
- Fully integrated into IDE’s
AgsJWS Toolkit

- Independent Web Services toolkit
- SOAP requests are handled by WS Handler and forwarded to appropriate Server Object
- AgsJWS implements its own custom SOAP stack and framework for XML serialization for ArcObjects through JAX-B.

- Two functions
  1. Serialize and Deserialize between Java and XML (JAXB)
  2. Packing as SOAP, transporting SOAP messages and protocol specific information, handling faults and exceptions through SAAJ and JAXWS.
AgsJWS Toolkit

- **Proxy Objects**
  - Communication with server and endpoints.
  - Call methods on the proxy to execute server-side logic
- **Value Objects**
  - Native types designed to support input & output from proxy objects.
Demos

- Online SOAP SDK
- Download the AgsJWS
- Set up the development environment
- Building the LocateMSOE client app
- Extra demo: Joplin Tornado path analysis
Building and using Web applications

- Web Clients
- Android
- Java SDKs
- Web Services
- Java SOEs
- Cloud
- Enterprise
- Local

Discover
Create
Manage
Visualize
Analyze
Collaborate
Building Web Applications

- Migrating Java Web ADF applications from local to remote connections
  - Existing tools to have a complete wizard driven experience
  - AgsJWS API is the core API
Migrating Web ADF Applications to web services

- Set up Eclipse Faces Config visual editor

- Modify your Local Map Resource to be a AgsMapResource
  - This will modify your connection to ArcGIS Server as web service endpoint URL allowing you to use the AgsJWS API in your Java Web ADF application.
Risks

• Editing Tasks
• Custom features using ArcObjects in ADF

• Solution
  - Server Object Extensions exposed through SOAP
  - AgsJWS Business component
BI + GIS = GBI (Geographic Business Intelligence)

GBI is the integrated inclusion of the geographic/spatial perspective with your organization's important business information. You care because nearly every significant aspect of your business has a location.
Map Widget for ArcGIS – Java Enterprise Mashup

• Map Widget for ArcGIS
  - Simple component model for GIS using ArcGIS API for JavaScript and iWidget specification
  - Can be extended to enhance operability
  - Coordination
    - Sharing information with other components in real time
    - Shared state with other components
Map Widget for ArcGIS – MapViewer Features

- Features
  - Send/Receive events to other components
  - Configure basemaps from ArcGIS Online, Bing Maps, & ArcGIS Server
  - Add operational layers from ArcGIS Online & ArcGIS Server
  - Rich user interactive operations
Map Widget for ArcGIS

- Map Widget for ArcGIS in Enterprise Mashups
  - IBM Specification
  - Integration with widgets which meet the spec
  - WebSphere 7

- ArcGIS iWidget for Enterprise Portals
  - Java Portlet Spec 2.0 (JSR 286) compliant
  - Backwards compatibility for Portlet spec 1.0 (JSR 168)
  - Support for Portal Server 6.1 Feature Pack 6.1.5
  - Increased support in Portal Server 7
Demo
Extending the widget

- **iWidget Design**
  - Simplicity
    - Simple to create and add features
  - Extensibility
    - Well defined means for iWidget feature support and feature leverage
  - Independence
    - The iWidget does not need to know what technology was used to implement
- **Style**
  - Defines javascript (EcmaScript) interfaces and declarative markup
Extending the widget

- **Open Source**
  - Beyond specification extensibility model
  - Full source provided
  - Opportunity to share with ESRI development
ArcGIS 10.1 for Java Developers
The ArcGIS Runtime

• Runtime SDK
  - Toolkit for building **focused ArcGIS apps** and embedding ArcGIS functionality
  - Work with both **local** data and **remote** REST services
  - Subset, streamlined functionality
  - For Lightweight devices: **Laptops, tablets**
  - **Linux** and Windows – 64-bit and 32-bit
  - **Java**/WPF/QT flavors of API
  - Eclipse integration

• Mobile: Android – part of the Runtime family
  - SDK for **native** Android apps
  - Freely downloadable app
Solid Foundation for Developers Moving Forward

- Designed for Desktop and Online Development

MyApp.jar

ArcGIS Runtime

API

ArcGIS Online

ArcGIS Server

Developers Are Productive on the Desktop and Online
The 10.1 ArcGIS Runtime at the UC...

• Road Ahead – ArcGIS 10.1 Overview
  - Tuesday 8:30am - 9:45am  room 10
  - Wednesday 1:30pm – 2:45pm  room 10
  - Friday 9:00am – 10:15am room  5a/b

• Road Ahead – ArcGIS Runtime
  - Thursday 2:20pm – 2:40pm  24a

**Demo Theater:**

• Building Java Applications with ArcGIS Runtime
  - Wednesday 9:00am Exhibit Hall D Desktop Developer Island
Summary

• Custom Web Services – Extending the ArcGIS Server
• Extending existing Java EE infrastructures with the AgsJWS SOAP Toolkit
• Building Web Applications
  • Mashup Center and Portal applications
  • ArcGIS Web API based applications
  • Migrating Java Web ADF applications from local to HTTP connections

• Continuing to build opportunities for Java-GIS developers at 10.1
  • Lightweight GIS
    - Runtime SDK
    - Mobile: Android
Thank you!

Any Questions?