Providing Interoperability Using the Open GeoServices REST Specification

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What is Your Definition?

Open Standards Interoperability
Web Services and Interoperability

• Successful IT systems increasingly require interoperability across platforms and flexible services that can easily evolve over time.

• Broad vendor agreement on standards and proven interoperability have set Web services apart from integration technologies of the past.
Agenda

Interoperability via Web Services –

- OGC Web Services Standards

- GeoServices Rest Specification
Agenda contd

• Esri’s Open Source Initiatives - Advancing Interoperability

• ArcGIS Online – Leveraging Interoperability
ArcGIS for Server - Vision

Powerful GIS capabilities

Delivered as Web services

To help solve real problems

ArcGIS Server
ArcGIS Server - Building open and interoperable Systems

**Supporting Multiple Protocols**
- Representational State Transfer (REST)
- Simple Object Access Protocol (SOAP)
- Open Geospatial Consortium (OGC)

Catering to Multiple Communities:
- Spatial Data Infrastructures (SDI)
- Enterprise Architectures (EA)
- Neogeography/ Mashup (WEB 2.0)
Building Open and Interoperable Systems using the OGC Web Services Specifications
OGC / ISO standards support (ArcGIS 10.2)

- **WMS**
  + Style Layer Descriptor
  + Filter Encoding Support
  + Time Support

- **WFS**
  + Transactions
  + Filter Encoding Support

- **WCS**
  + GeoTiff, NITF, HDF, JPEG, JPEG2000, PNG

- **WMTS**
  + REST & KVP Encoding

- **WPS**
  + Synchronous
  + Asynchronous
  + Data and Services as inputs

- **CSW**
  + OGC Core
  + ISO 19139
  + ebRIM

Demo

OGC Services
Building Open and Interoperable Systems using the GeoServices REST Specification
## REST – The Elevator Pitch

<table>
<thead>
<tr>
<th>4 Key Principles*</th>
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</thead>
<tbody>
<tr>
<td>Identification Of Resources</td>
<td>Everything is a URL</td>
</tr>
<tr>
<td>Manipulation Of Resources Through Representations</td>
<td>Exchange standard formats using standard verbs</td>
</tr>
<tr>
<td>Self-Descriptive Messages</td>
<td>Every request asks the full question, every response includes the full answer</td>
</tr>
<tr>
<td>Hypermedia As The Engine Of Application State</td>
<td>Hyperlinks&lt;br&gt;(&lt;a href=&quot;url&quot;&gt;Yeah!&lt;/a&gt;)</td>
</tr>
</tbody>
</table>

*The four key principles of REST (Representational State Transfer) are:

1. **Identification Of Resources**
   - Everything is a URL

2. **Manipulation Of Resources Through Representations**
   - Exchange standard formats using standard verbs

3. **Self-Descriptive Messages**
   - Every request asks the full question, every response includes the full answer

4. **Hypermedia As The Engine Of Application State**
   - Hyperlinks

[Source: http://www.intertwingly.net/blog/2198.html]
The ArcGIS Server REST API provides a simple, open Web interface to services hosted by a Server.

All GIS Services are exposed as resources.

All resources exposed by the REST API are accessible through a hierarchy of endpoints or Uniform Resource Locators (URLs) for each GIS service published with the Server.

Some resources have operations:
- Ex. Map Resource (export, find, identify)

Example: http://sampleserver3.arcgisonline.com/arcgis/rest/services
Types of GIS Services

Map
View or query a 2D map on the server

Geocode
Perform address matching on the server

Geometry
Provides geometric calculations such as buffer, simplify, and project.

Geoprocessing
Provides spatial analysis and data processing services.

Image
Provide access to raster data though a Web service

Feature
Provide access to feature querying and editing

http://resources.arcgis.com/content/web/gis-services
Client Libraries – Consuming the REST Services

- ArcGIS Developer Tools support for REST API
  - Web API
    - ArcGIS API for JavaScript
    - ArcGIS API for Flex
    - ArcGIS API for Silverlight
  - Mobile Runtime SDK’s
    - ArcGIS Runtime SDK for iOS
    - ArcGIS Runtime SDK for Windows Phone
    - ArcGIS Runtime SDK for Android
Open Layers - Supporting ArcGIS REST Services

http://openlayers.org/dev/examples/arcgis93rest.html
Quick History Lesson
Demo

GeoServices REST
Esri - Open Specifications

- Shapefile
- File Geodatabase API
- Geoservices REST Specification

…… Advancing Interoperability
Esri’s Open Initiatives

Our strategy incorporates the many aspects of an open platform - open code, open data, open formats, open content, and open community.

• Centralized many of our Open Source Software projects via the Esri Github community
• GeoPortal – Esri’s Open Source Platform for Collaboration & Sharing
• Openstreetmap Editor – Esri’s OS Arcmap extension for editing OpenStreetMap Data
• Open-sourced a core geometry engine to enable developers to leverage the Hadoop Big Data platform.

…… Advancing Interoperability
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Tour of Esri’s Github
Some Links to Esri’s Open Source Libraries

- https://github.com/Esri/geoservices-js
- https://github.com/Esri/Terraformer
- https://github.com/ajturner/geoservices-ruby
- https://github.com/kevinsigwart/EsriOpenLayersClient/
- https://github.com/Esri/esri-leaflet
ArcGIS Online

A complete, cloud-based, map-centric, collaborative content management system for working with geographic information.

Supporting Interoperability thru

GeoServices REST Specification, OGC WMS, CSV, OGC KML, OGC WMTS, ….

…… Leveraging Interoperability
Demo

ArcGIS Online
Thank you…

Please fill out the session evaluation

Session ID: 954
Offering ID: 1287

Online – www.esri.com/ucsessionsurveys
Paper – pick up and put in drop box