



# Leveraging the OGC Capabilities of ArcGIS Server

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# ArcGIS Server is Open & Interoperable

*Using Standards to Integrate with Any System*

## Web

- REST, SOAP XML, REST, KML, V.E. . . .

## OGC

- GML, WFS, WMS, WCS . . .

## Enterprise Integration

- SOAP, XML, EJB, SQL

## Application Content

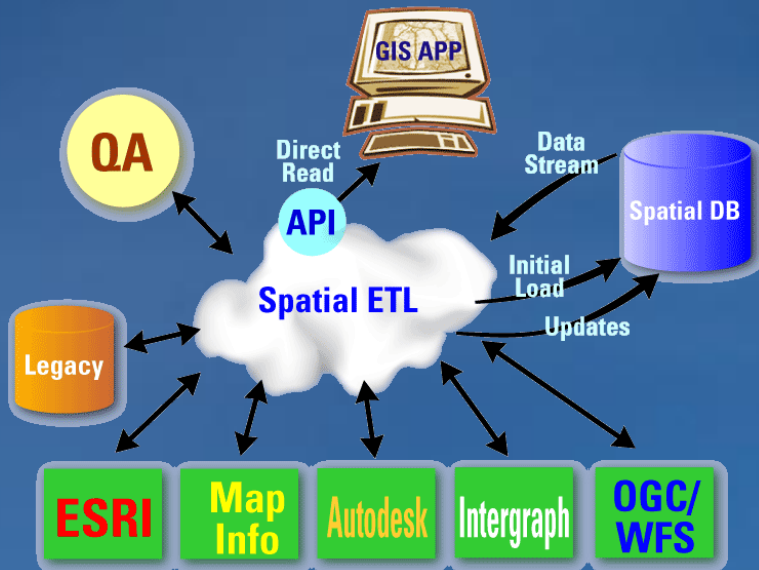
- CAD, Image, PDF



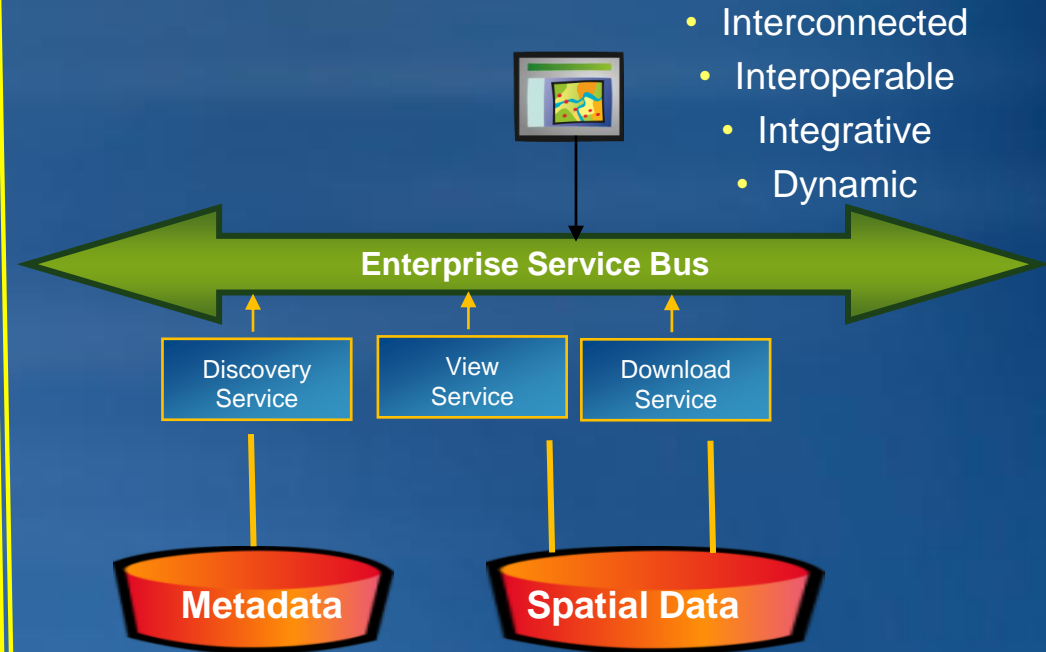
# Approach to interoperability

## Supporting Multiple Approaches

### Spatial ETL (Extract, Transform and Load)



### Services Oriented Architecture (SOA)



*Loosely Coupled and Orchestrated Services*

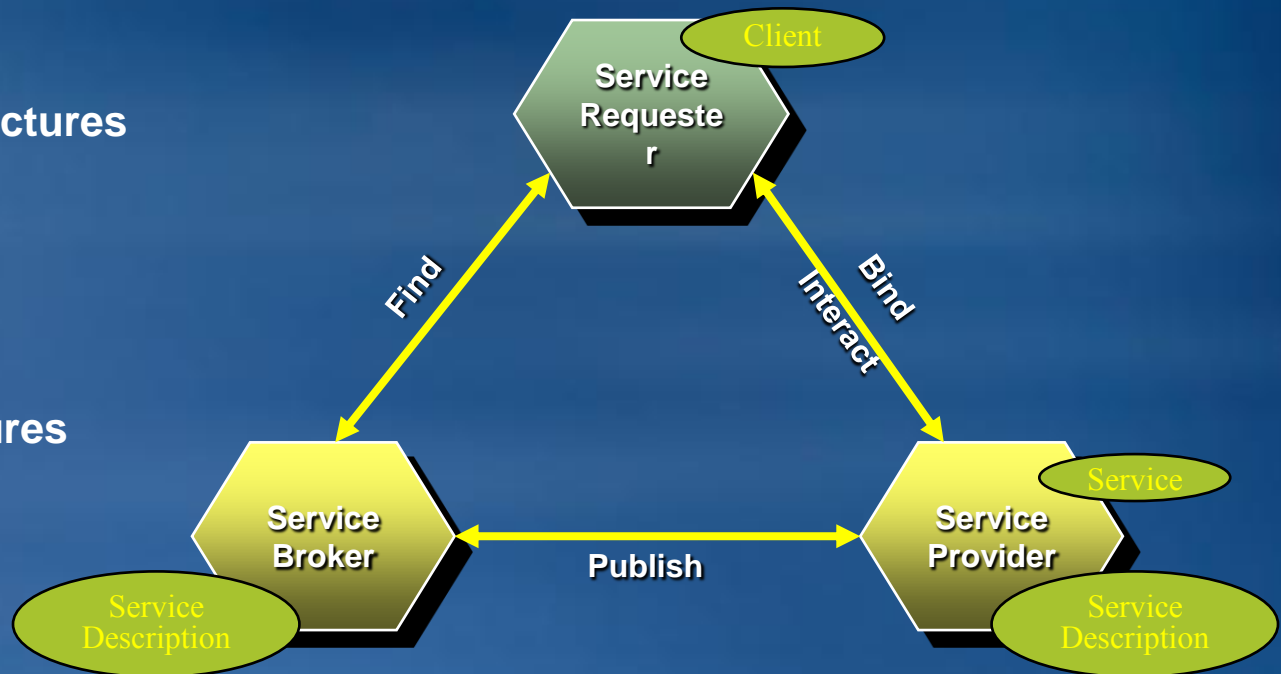
# Service Oriented Architecture

- ArcGIS Supports Interoperability for:

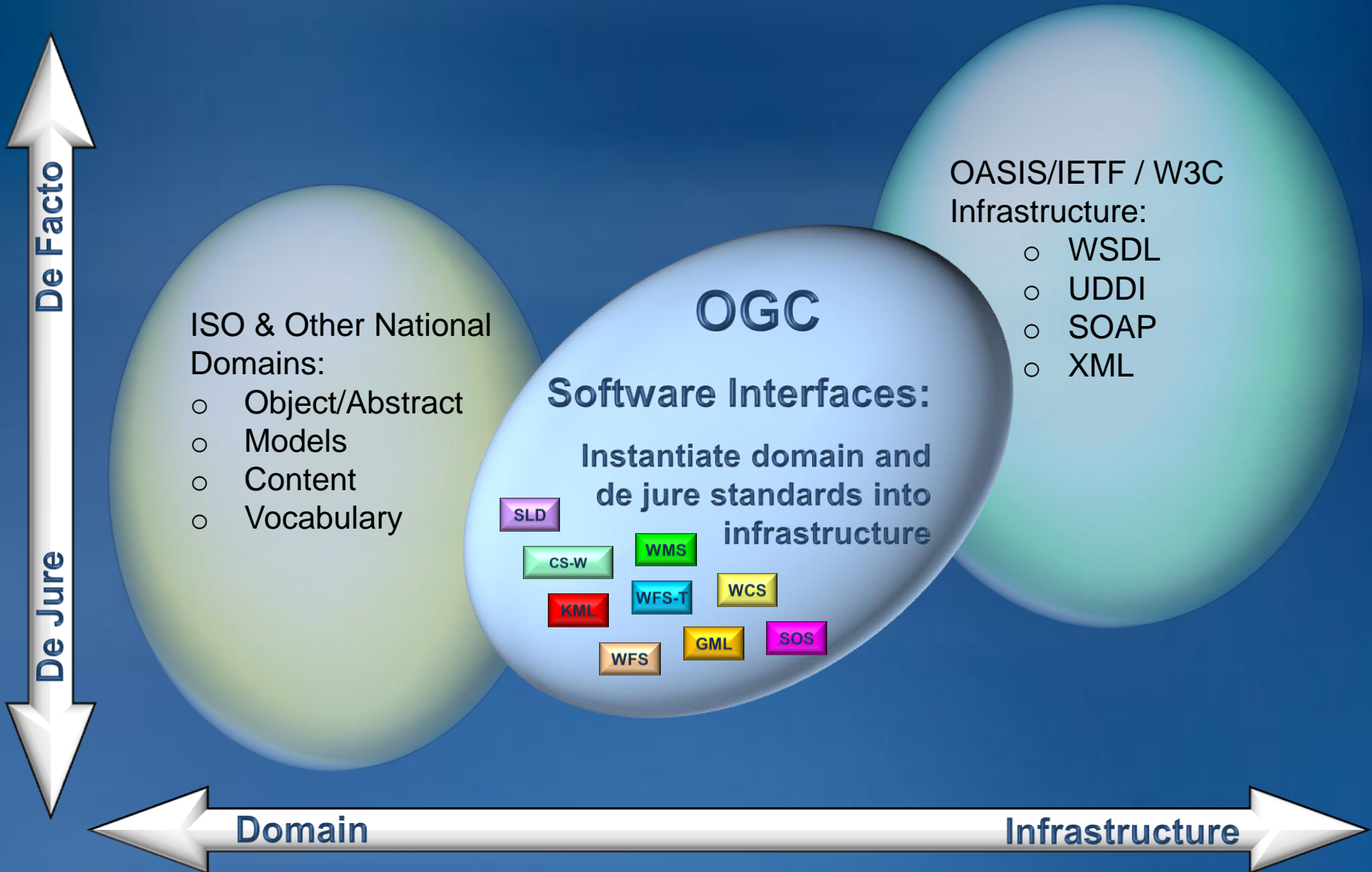
- Spatial Data Infrastructures

- Enterprise Architectures

- Neogeography, Mashup and WEB 2.0 environments



# Where does OGC fit in the 'standards' world?

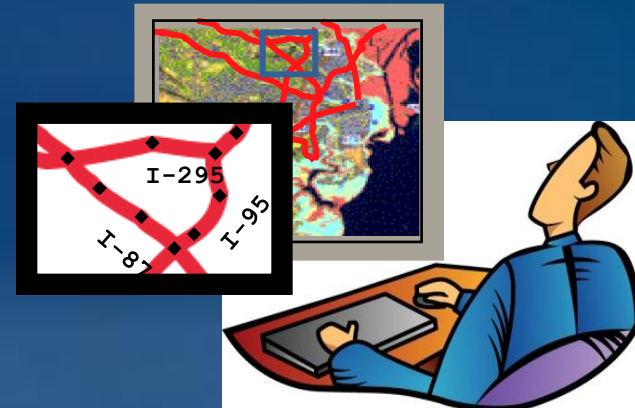


# OGC Web Services



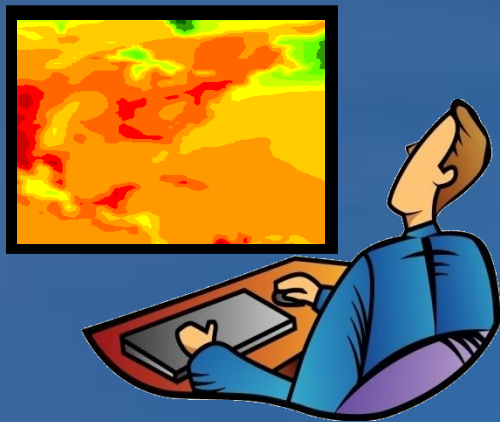
## Web Map Service

Geospatial “picture” publishing/viewing service



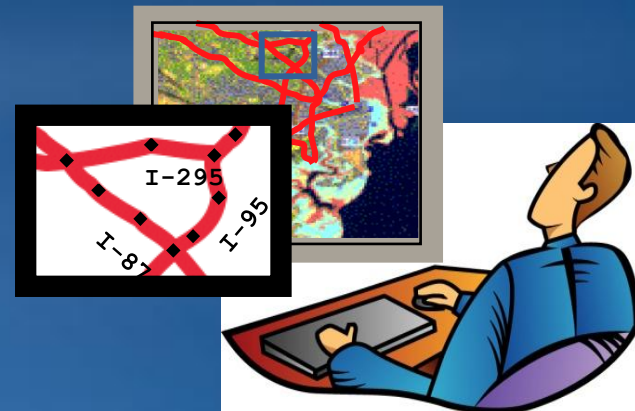
## Web Feature Service

Geospatial feature publishing/streaming service



## Web Coverage Service

Imagery and gridded data publishing/processing service



## Keyhole Markup Language Service

Geospatial feature publishing/streaming service



# Visualization:

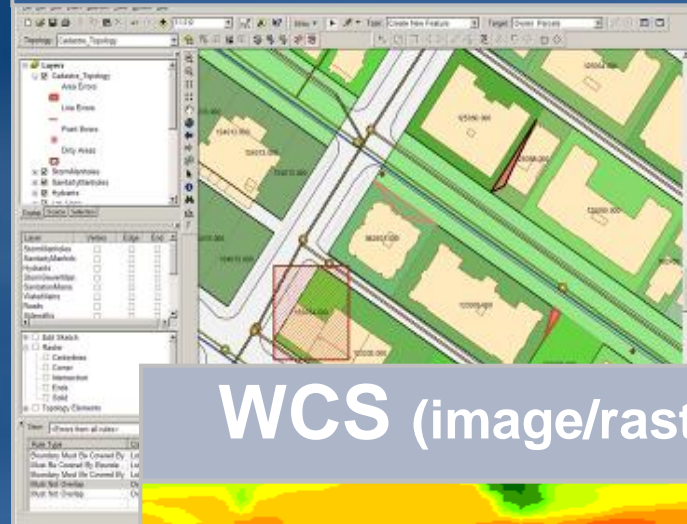


# GIS Data Sharing:

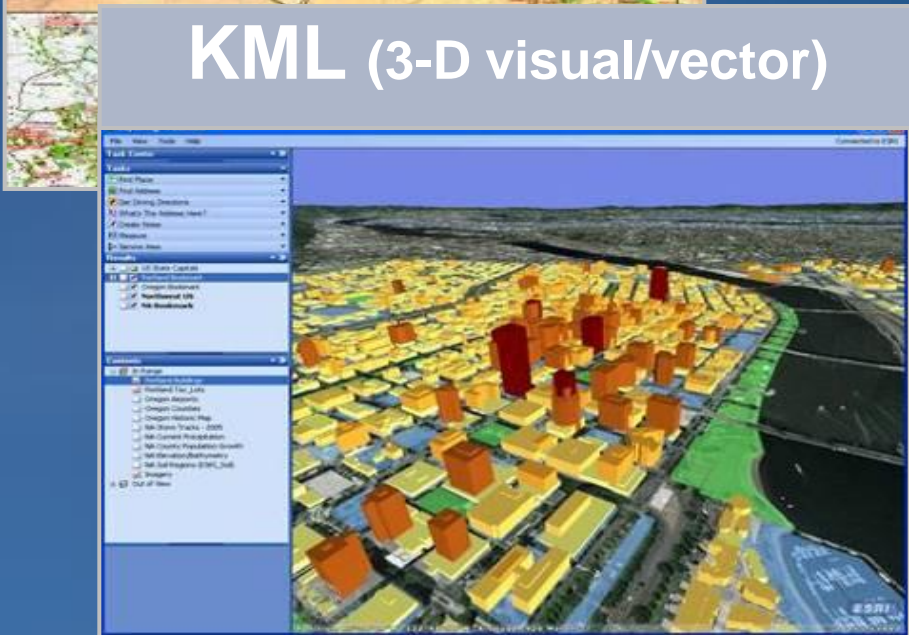
## WMS (mapping)



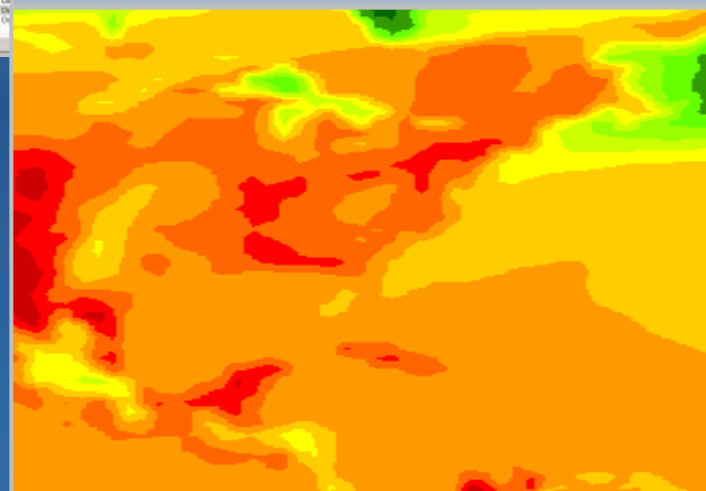
## WFS (feature/vector)



## KML (3-D visual/vector)

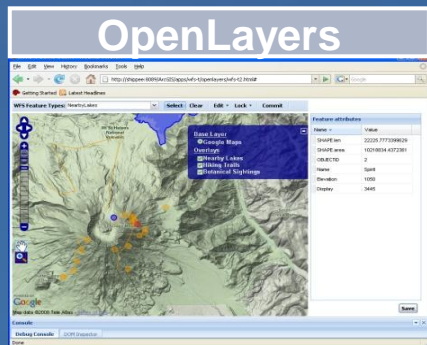
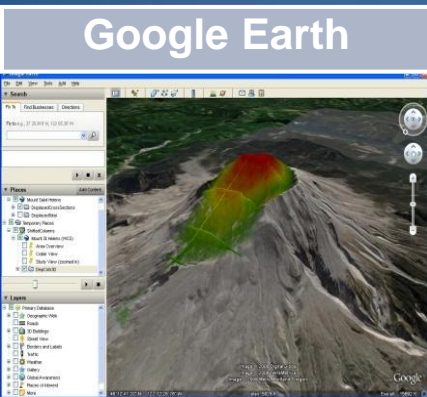
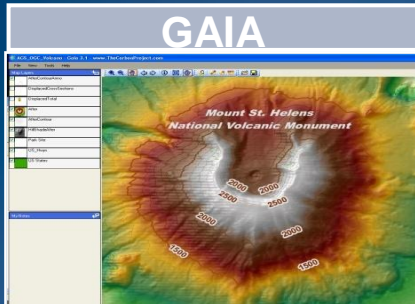


## WCS (image/raster)

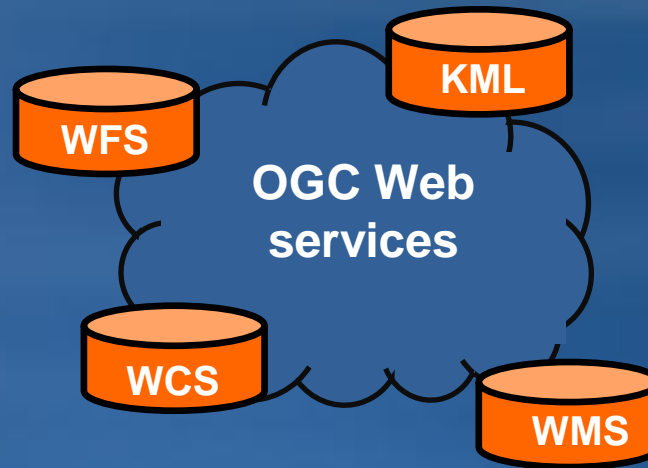


# ArcGIS: OGC server and client

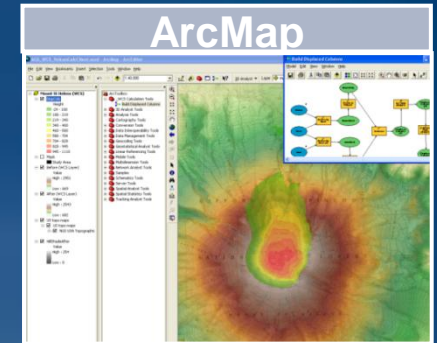
## 3<sup>rd</sup> party OGC clients



## ArcGIS Server



## ESRI OGC clients



## Web Mapping App





# ArcGIS Services and OGC Services

## Map Service

- + WMS
- + WFS
- + WCS
- + KML

## Image Service

- + WMS
- + WCS
- + KML

## Geodata Service Service

- + WFS
- + WCS
- + KML

9.2

9.3

9.3.1

9.4 +

WMS

- WMS on MapService
- 1.0.0, 1.1.0, 1.1.1, 1.3.0
- GetCapabilities
- GetMap
- GetFeatureInfo

- add WMS on ImageService
- Styled Layer Descriptors (SLD)
  - publish multiple styles at server side
  - send external styles through "SLD"
- Filter Encoding (FE) in SLD
- Security (inherits ArcGIS Server Security Framework)
- bug fixes

- add WMS on Optimized MapService
  - performance is up
  - functionally equal to classic MapService

- enhanced SLD support
  - "SLD\_BODY"
  - GetStyle

- add "Time" support
- GetLegendGraphics ?
- bug fixes

KML

- KML on MapService
- KML 2.1

- KML on ImageService
- KML through ArcGIS REST API
- bug fixes

- KML 2.2 (to OGC namespace)
- bug fixes

WCS

- WCS on MapService
- WCS on ImageService
- WCS on GeoDataService

- 1.0.0, 1.1.0, 1.1.1

- GetCapabilities
- DescribeCoverage
- GetCoverage

- "Make WCS layer" GP tool

- bug fixes

- updated "Make WCS layer" GP tool

- add WCS on Optimized MapServer
- bug fixes

WFS

- WFST on MapService
- WFST on GeoDataService

- 1.1.0

- GetCapabilities
- DescribeFeatureType
- GetFeature
- GetFeatureWithLock
- Transaction

- WFS to FeatureClass GP tool

- add WFST 1.0.0 (9.3 SP1)
- bug fixes

- add WFS on Optimized MapService
- bug fixes

# Demo 1

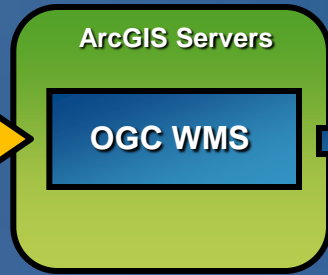


3<sup>rd</sup> Party desktop client  
( Gaia3 )



External SLD XML  
(client-side)  
Through  
"SLD\_BODY"

Map document

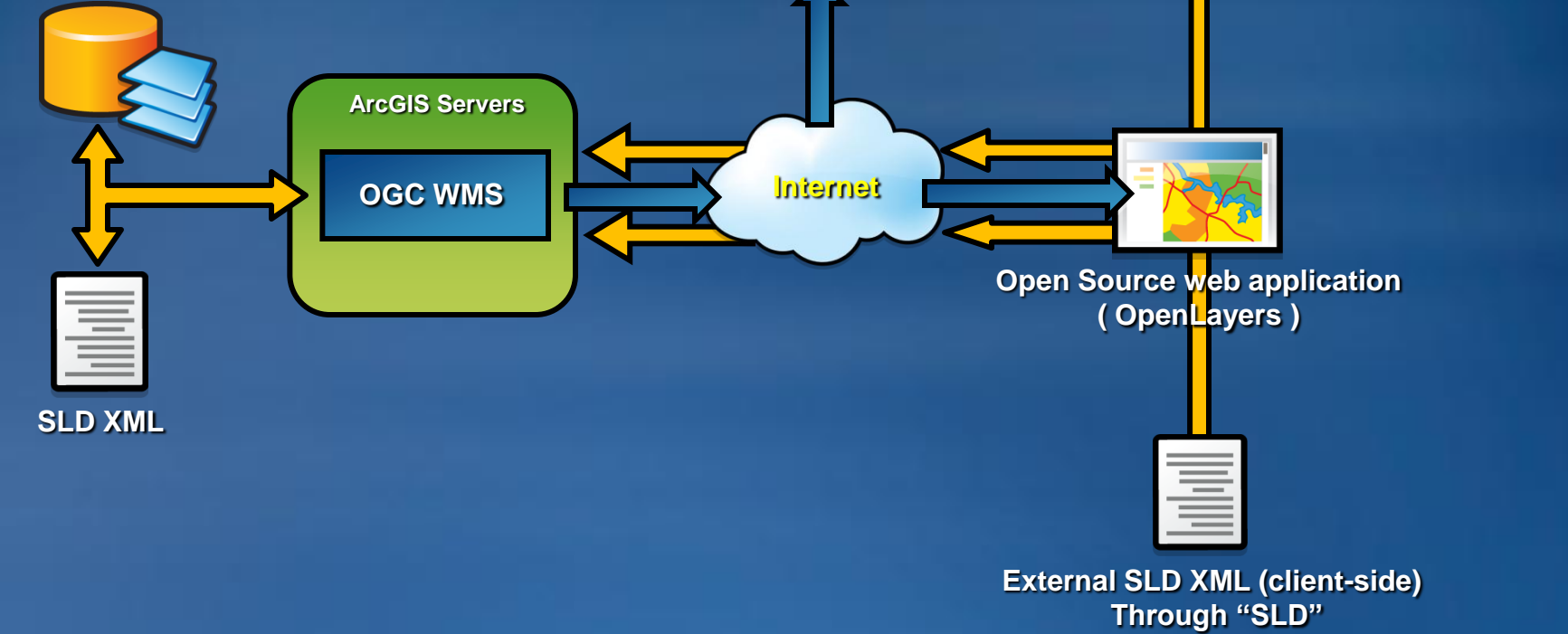


Open Source web application  
( OpenLayers )



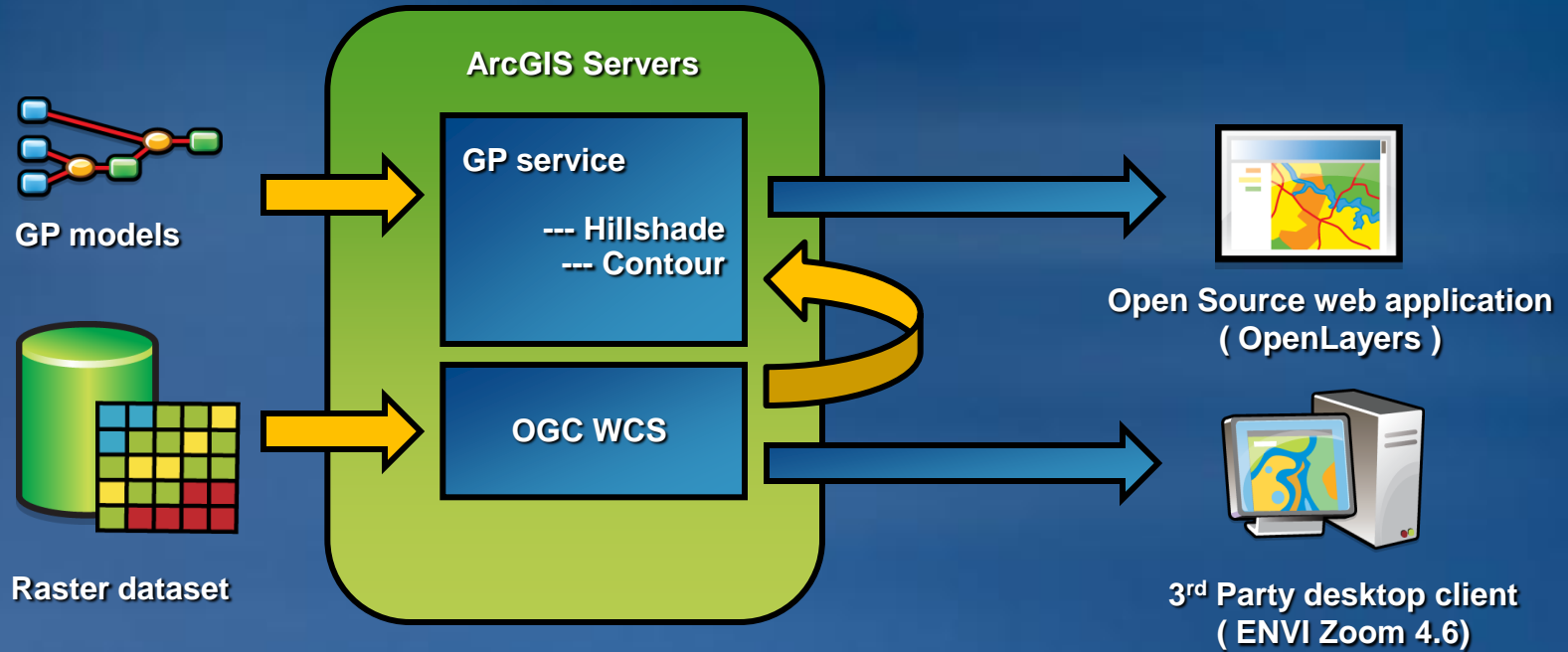
SLD XML

External SLD XML (client-side)  
Through "SLD"

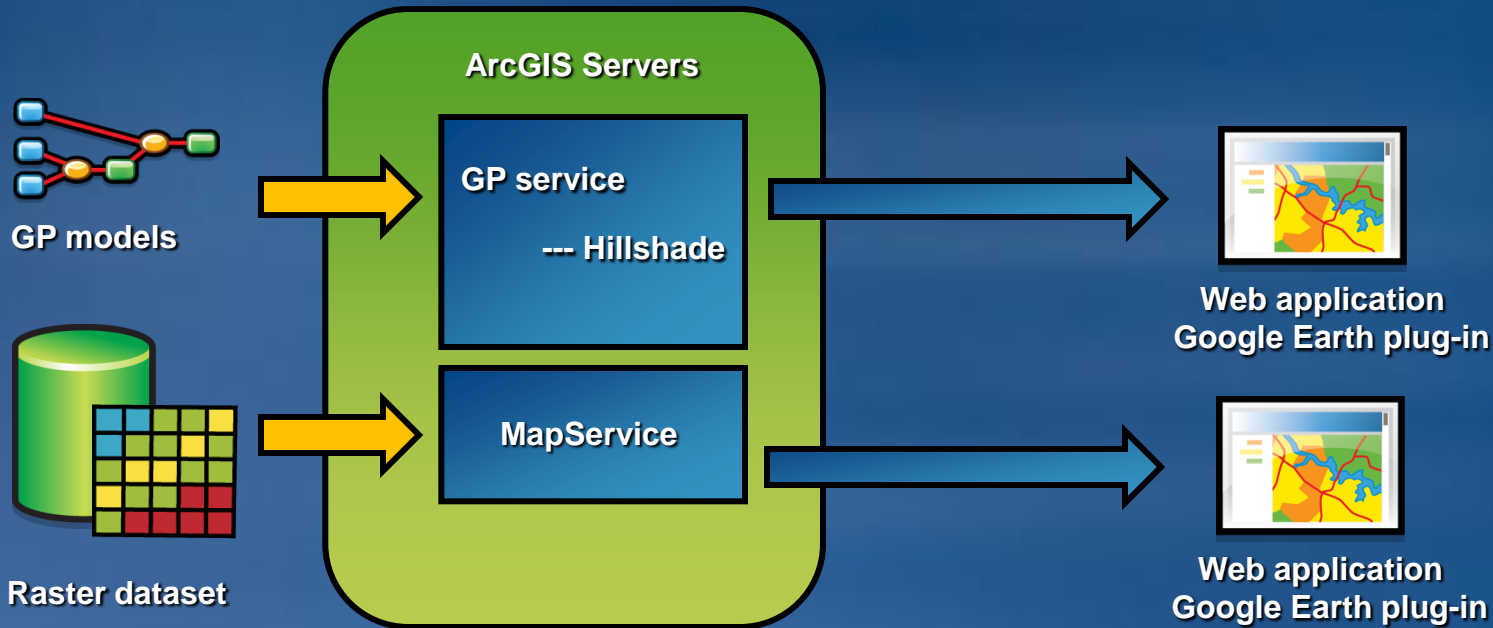




## Demo 2



# Demo 3



# WFS Service

- A data service (features)
- “GML over HTTP”
- Features organized in Feature Types
  - equivalent to ArcGIS’ feature classes
- WFS – T (Web Feature Service with transactions)
  - Features can be updated by client

## **WFS Services – 9.3 sp1**

- **Implements WFS 1.0 and 1.1**
- **Uses the Simple Features GML Profile**
  - **A subset of GML 3.1**
- **You can publish either a geodatabase or a map**
  - **enable WFS capabilities**
- **Clients applications use a URL to access the WFS service**
- **Works with both versioned and non-versioned geodatabases**

# WFS Services – Supported Methods

- **GetCapabilities**
- **DescribeFeatureType**
- **GetFeature**
  - Includes Filter support
- **GetFeatureWithLock**
- **Transaction**
  - insert, update, delete



# WFS Services – Transactions

- **Transactions allow you to publish data so that it can be edited by WFS-T clients**
- **Uses pessimistic locking of features**
  - **GetFeatureWithLock**
- **Requires ArcSDE Geodatabase**
  - **Uses versioning**

# WFS Services – Transactions

- **Multiple remote editors**
- **Stateless**
- **Satisfied via pooled configurations**
  - Doesn't require a dedicated SOC process per editor
- **No ESRI software required on the client**

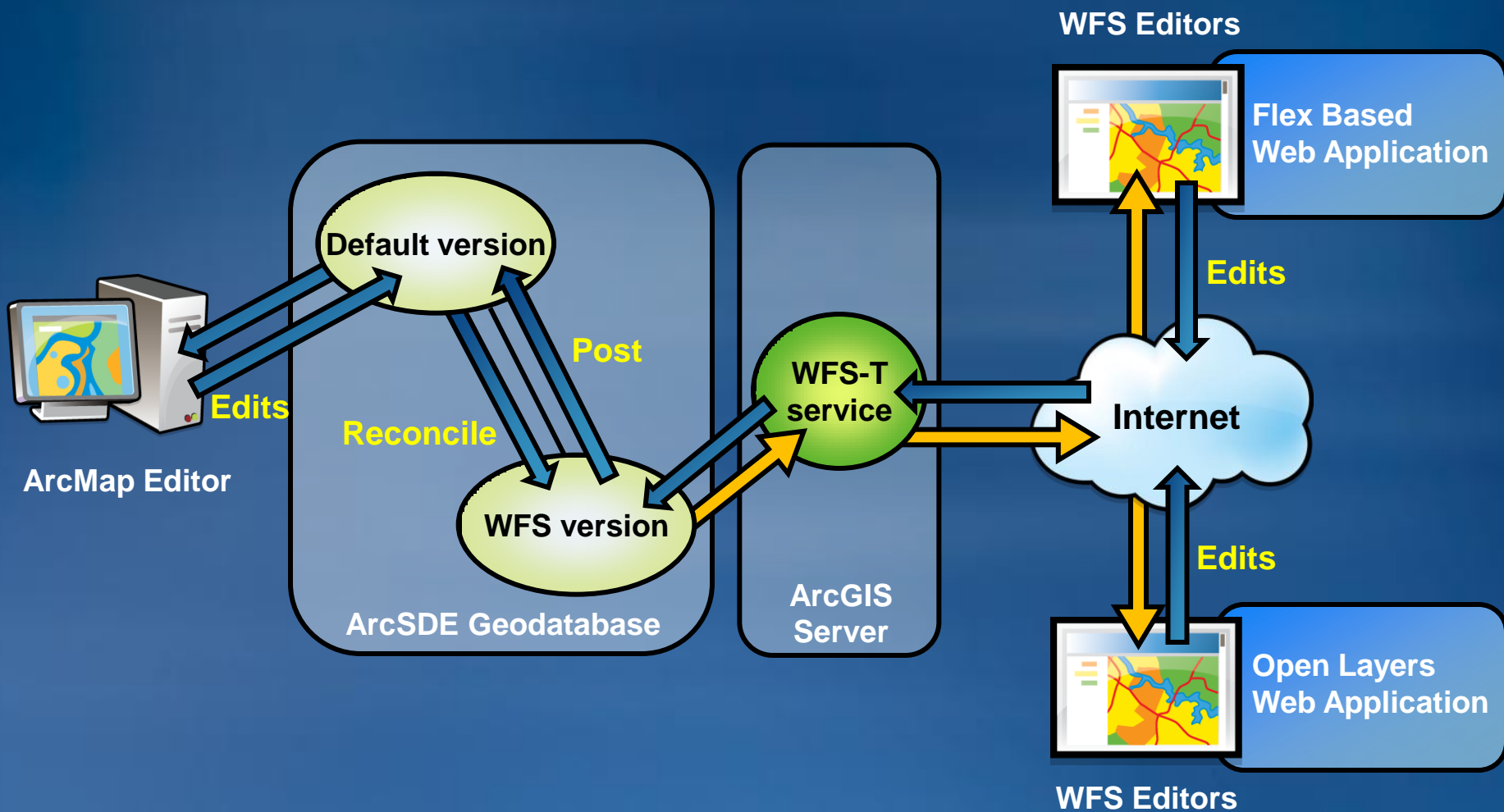
# WFS Services – Transactions Workflow

- **Create a child version for WFS editors**
- **Publish a WFS service based on that version**
  - enable transactions
- **WFS editors can now edit the service using WFS transactions**
- **Periodically reconcile & post the WFS version with its parent version**
  - Makes ArcMap edits visible to WFS editors
  - Makes WFS edits visible to ArcMap editors

# WFS Services – ArcGIS Clients

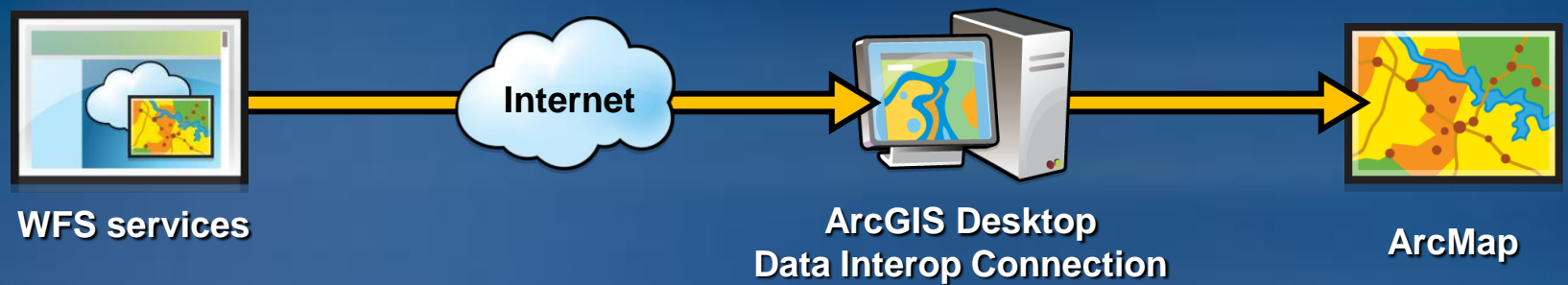
- **The Data Interoperability Connection can be used to work with WFS services (as of 9.2)**
  - A separate license of the data Interoperability Extension is not required to consume simple features GML (level 0)
- **WFS To Feature Class GP tool allows you to import data into a Geodatabase from a WFS Service**
  - Independent of the Data Interoperability Extension

# Demo 4 – WFS and WFS-T services

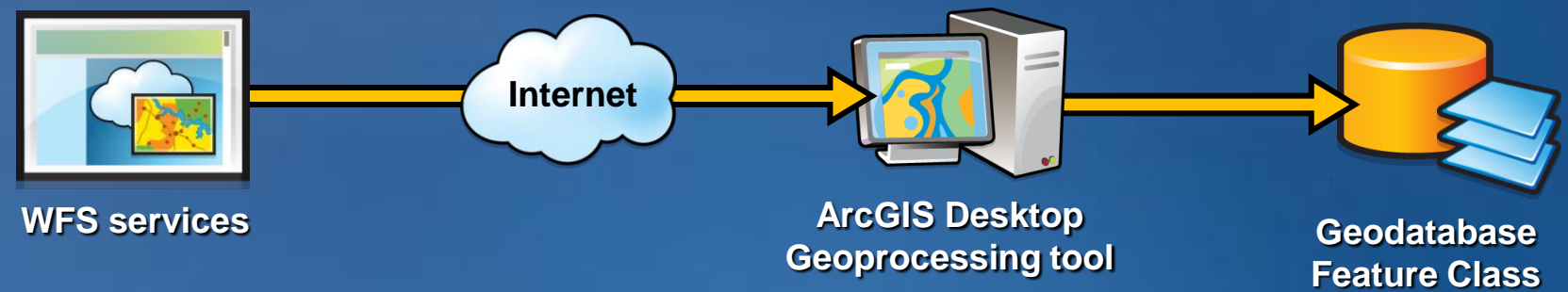


# Demo 5 – ArcGIS as a WFS Client

- The Data Interoperability Connection



- WFS to Feature Class Geoprocessing tool



## OGC / ISO standards support ( ArcGIS 9.3)

- WMS
  - + SLD
  - + Filter Encoding Support
- WFS
  - + Transactions
  - + Filter Encoding Support
- WCS
  - + GeoTiff, NITF, HDF, JPEG, JPEG2000, PNG
- GML
  - + Simple Features GML
  - + OS Master Map, Top10NL, NATO, CityGML
- KML
  - + OGC KML
- Metadata
  - + ISO 19139
- CSW
  - + OGC Core
  - + ISO 19139
  - + ebRIM

<http://www.esri.com/library/whitepapers/pdfs/supported-ogc-iso-standards.pdf>

## 9.3 Client Support for OGC Web services

- ArcMap
  - WMS, WFS, Simple Features GML, WCS, KML
- ArcMap ( with portal toolbar add-on)
  - Additional support for CS-W, WMC
- ArcMap ( with Data Interoperability Extension )
  - WFS, GML (many application schemas)
- ArcGIS Explorer ( with custom tasks)
  - CS-W, WMC
- WebADF
  - WMS
- Portal Toolkit Mapviewer
  - WMS, WFS, WCS
- ArcGIS Explorer
  - WMS
  - KML

<http://www.esri.com/library/whitepapers/pdfs/supported-ogc-iso-standards.pdf>



# In Conclusion...

Please fill out session surveys!

- **Still have questions?**

[www.esri.com/standards](http://www.esri.com/standards)

# Resources

- **ESRI Web Site**
  - White papers
  - Product Support Matrix
  - OGC CompliancyLink: <http://www.esri.com/standards>
  
- **OGC Website**
  - Link: [Opengeospatial.org](http://Opengeospatial.org)
  
- **Product Help**
  - Metadata SupportLink: [Metadata Standards and the ArcGIS Metadata Format](#)
  - Data InteroperabilityLink: [Using the data Interoperability Extension](#)
  - GML SupportLink: [GML Support in ArcGIS](#)

# Want to Learn More?

*ESRI Training and Education Resources*

- **Instructor-Led Training**
  - **Introduction to ArcGIS Server**
  
- **Free Web Training Seminar**
  - **Leveraging OGC Capabilities in ArcGIS Server 9.3**