Discovery and Access of Geospatial Resources Using GIS Portal Toolkit

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Outline

• Elements of Spatial Data Infrastructures
• Current trends
• Position of GIS portals
Question: What is Needed to Deliver these Products to your Users?
Some Components of SDI

- Author
- Serve
- Discover
- Use
- Tasking
- Production Workflow
- Program
- Data Collection
- Visualization
- Products and Services
- Analysis
- Mission Critical Applications

Data

Mission Critical Applications

Analysis
SDI Involve Many Workflows

1. Source Capture and Compilation
2. Job Tracking
3. Data Management
4. Data Editing
5. Mapping Organization Requirements
6. Interoperability
7. Data Maintenance and Quality Assurance

Geodatabase

DBMS

Quality Control

Workflow

Data and Cartographic Dissemination

Web Portal Services
- SDI Catalog
- Maps/Olives
- Images
- E-services
- Imagery
- Geocodes

Data Products
- Imagery
- Grids/Raster data
- Vector Data
- PDF

Mega/Charts
- Hardcopy
- Maps
- Charts
- Atlases
SDI Result in Products and Services

- Publishers
- Topography
- Boundaries
- Hydrography
- Geodetics
- Transportation
- Imagery

Products and Services

GIS Portals
Store-front

Analysis

Users
Discover Resources from Geoportals

- Central resource for easily accessing, storing, and sharing content

- Includes a library of maps that the entire SDI community can work with.

- Search geographic information, sign up for an account, sign in, and utilize communities/groups
Discover Resources from Desktop GIS

• Search Task for ArcMap & ArcGIS Explorer
  – Search CS-W Catalogs
  – View Metadata Footprints
  – Add to Map/Globe
  – Common Architecture
  – Common User Experience

Mash Up ArcGIS with Other Web Services

http://sampleserver1.arcgisonline.com/ArcGIS/rest/services
Serve and Consume Information Feeds

Feed Types:
- RSS
- GeoRSS
- CAP
- KML
- SensorML

Producers:
- Mobile Clients
- In-situ sensors
Services Architectures Support SDI

Use Environment
- GIS Portals
- Lightweight
- OGC Compliant
- 2-D & 3-D “Science Viewers”
- Desktop GIS
- Domain Applications

Supporting Services
- Thesaurus Services
- Authentication Services
- GIS Data

Geospatial Web Services Platform
- Development
  - API SOAP/REST
- Geo-processing Services
- OGC Services
- Tracking Services
- Location Services

Catalog
- Catalog Services
- Metadata
- Places Addresses

Data Warehouse
- Extraction Services
- 2-D Base Map
- 3-D Base Map

Supporting Services
- Derive elevation
- Query National Grid
- Derive Elevation Profile
- Delineate Watershed Boundary
- Avian Flue Cluster Analysis
- Earthquake Prediction
- Hurricane Path Prediction
- ...
SDI Are Like Social Networks

- SDI have similar topology:
  - Some large nodes (hubs)
  - Many smaller nodes
  - Nodes cross-reference each other
  - Scale-free
- Invariant to application domain:
  - Enterprise, State, Country, Global, Community, ...
A Society Is Like a Play With Different Roles

- **Data/Service Provider**
  - Organizations providing the actual content to the SDI

- **Clearinghouse**
  - The Yellow Pages of the SDI

- **Portal**
  - The Grocery store of the SDI

- **Domain Applications**
  - The Users of the SDI products and services
Every Society Needs Some Rules

- Data Sharing Agreements
- Education on Policies and Best-practices
- Host and Maintain SDI Components
- Collaboration
SDI Require an Enterprise Approach

- Useful Enterprise Business Models:
  - Inventory Management (Metadata)
  - Production Planning (Who, What, When)
  - Supply Chain Management
- Rationalization for efficiency and use
- Consolidation, Integration, Acquisition, Training, and Support

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ArcGIS JTX – Geospatial Workflows

http://www.3gerp.org
Outline

• Elements of Spatial Data Infrastructures
• Current trends
  – People
  – Technology
  – Architecture
• Position of GIS portals
Current Trends – People

• Content providers
  – Growth in availability of services
  – Commercial

• Communities building SDI
  – Domestic – States, Federal Agency, Geospatial One-Stop, RAMONA
  – Regional – INSPIRE
  – Global – GEOSS, GSDI

• Building bridges between communities
  – RAMONA contributes to GOS, GOS contributes to GEOSS
  – GSDI, INSPIRE, Netherlands
Current Trends – Interfaces

- Interoperability is real:
  - Z39.50
  - Web-Accessible Folder
  - OGC CS-W
  - OGC WMS
  - OGC KML
  - OGC WFS
  - OGC WCS
  - ...

- Micro Formats:
  - OpenSearch
  - GeoRSS
  - Atom
  - CAP

- Metadata
  - ISO, FGDC, Dublin Core

ArcGIS supports all these interoperability specifications
Current Trends – Architecture

- (Web) Services-Oriented Architectures:
  - SOAP, REST
  - JavaScript, Flex, Silverlight
  - The Cloud
- Appliances:
  - Data/Storage
  - Search
  - Situational Awareness Bundle
  - SDI?
- Open Source:
  - ArcGIS Resource Centers
  - GIS Portal Toolkit Source Code license
  - ESRI co-founder of 52° North
    - Sensor Web Enablement
    - Security and Geo Rights Management
    - Web Processing Services

http://52north.org
Outline

- Elements of Spatial Data Infrastructures
- Current trends
- Position of GIS portals
  - What Users Want
  - ESRI GIS Portal Toolkit
  - ArcGIS Online
  - What’s Next?
Use Case: “I want to find data …”

- **Solution:**
  - Simple keyword search
  - Advanced options for experts
  - Smart matching and ranking
  - Search results must be simple to understand ... yet contain detail for power-users
Use Case: “I want to make a map ...”

**Solution:**
- Browser-based map viewer that can combine data services from one or more GIS data sources
- Provide Lightweight Alternative
- Determine Requirements for
  - map navigation
  - printing
  - selection queries
  - data exploration
  - direct use of online Web services
  - fuse multiple services into a single map
  - Annotation
Use Case: “I want to download data ...”

- **Solution**: Provide page with simple choices for:
  - Selecting area
  - Selecting data
  - Setting options
  - Deliver download link through email
Use Case: “I want to advertise my data …”

**Solution:**

- Give user choices for publishing metadata:
  - Create metadata online
  - Upload metadata
  - Register SDI catalog site for harvesting
- Support metadata standards
Use Case: “I want to know when new data is available …”

• Solution:
  – User specify search criteria
  – Give user link to a geoRSS feed
  – User subscribes to geoRSS feed

See results through REST API: GEORSS HTML FRAGMENT KML
Use Case: “make e-Government spatially enabled”

Solution:
- Embed a City Map
- Services locators
- What hospitals are nearby?
- Directions to a service
- Search for data
- Drive time
What is the GIS Portal Toolkit?

• Purpose: *Enable Discovery and Use of Geospatial Resources*

• Enables you to build a **GIS Portal** with the following capabilities:
  – Finding Resources
  – View Resource Descriptions
  – View Map Services
  – Connect to Other Resources
  – Register Resources
  – Download Data
  – Manage the Catalog
  – Harvesting from other Catalogs
What’s New in GIS Portal Toolkit 9.3.1

- Bug Fixes
- Expanded Documentation
- Platform Support
- Discovery Enhancements
- Publishing Enhancements
- Interoperability Enhancements
- Licensing Update
Platform Support

- **Operating System:**
  - Windows XP Professional SP3
  - Windows 2003 Server 32-bit
  - Windows 2003 Server 64-bit
  - Windows 2008 Server 32-bit
  - Redhat Linux 32-bit

- **Servlet engine:**
  - Apache Tomcat 5.x
  - Apache Tomcat 6.x
  - Sun Glassfish
  - Oracle WebLogic Application Server 10

- **Database:**
  - Oracle 9i
  - Oracle 10g
  - Oracle 11g
  - Microsoft SQL Server 2005
  - Microsoft SQL Server 2008
  - PostgreSQL 8.3

- **ArcGIS Server Enterprise Standard 9.3.1**
Discovery Enhancements

- Restrict Access to Metadata
- Inline Map Service Preview
- Directed Search to Remote Catalogs
- Thesaurus Service Integration
- Sitemap Generation
Restrict Access to Metadata

• Unrestricted
  – All (approved) documents are visible to all users

• Public-Protected
  – Public documents are visible to all users
  – Only members of 1 specific group see the protected documents

• Restricted
  – Unrestricted documents are visible to all users
  – Restricted documents are accessible only to groups that have been granted access to the documents

• All interfaces to GPT apply the same policy
• Public-only and authenticating endpoints for CS-W and REST
Restrict Access to Metadata

Control Access to Metadata at Document Level
Restrict Access to Metadata

*Authenticated User Also Sees Restricted Content*
Metadata Details Page Supports Preview of:
- ArcGIS Server REST
- OGC WMS
- GeoRSS
- KML

Built using ArcGIS Server JavaScript API

Extensible framework to support future preview and use functions
Directed Search to Remote Catalogs

- Every GIS Portal may search other catalogs through CS-W
- Every GIS Portal may search ArcGIS Online
- Directed search complements harvesting
Thesaurus Service Integration

- Include thesaurus service
- Support expanding search to include related terms from thesaurus
  - Portal Search
  - REST
  - CS-W
- Portal operator may load specific thesaurus content (OWL)
Sitemap Generation

- Make your portal content discoverable by Internet Search engines
- Runs as scheduled task
- Public content only
- Follow sitemap.org protocol
Simplify Registration

- Validate Tool
- Register Service directly and extract metadata from service information:
  - WMS
  - KML
  - GeoRSS
  - ...
- Safe draft metadata from online form
Simplify Registration

New Validate Tool

GIS Portal Toolkit 9.3

Validate Metadata

Your document was validated successfully.

Please use the Browse button to select the metadata file from your computer. The file must be in FGDC or ISO metadata standard and in Extensible Markup Language (XML) format.

File: Desktop\Metadata\USCS\FM Radio with XSL.xml

Browse...
Simplify Publishing
Register Services Directly
Interoperability Enhancements

- Enhanced OpenSearch support
- Pass OGC Compliance Test for CS-W interface
- Updates to CS-W Client for ArcMap and ArcGIS Explorer
Licensing Update

- **GPT 9.3**
  - Standard Maintenance Subscription Needed to get Technical Support or Software Updates
  - No-cost license
- **GPT 9.3.1**
  - Maintenance update for users current on maintenance
  - License fee for new users
- **Existing Users:**
  - Enroll in maintenance now to receive 9.3.1 at no additional cost
  - Current ELA that include GPT: you are covered for GPT maintenance
  - Current ELA without GPT: talk to your account manager
  - New ELA: GPT needs to be explicitly added
  - If you have questions: talk to your account manager
- **Other:**
  - GPT has been added to GSA Schedule A (2/17)
  - GPT will be added to Master License Agreement
  - *GPT Source Code may be licensed*
Questions?

• Join us at the GPT User Group Meeting
  – Friday 2/20, 2:30 PM Room 204 C

• Contact us at portal@esri.com

• Visit: http://www.esri.com/gisportal