GEOINT
Interoperability Demonstration

A Standards Based Geospatial Intelligence Services Demonstration

POCs:

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United States Geospatial Intelligence Foundation (USGIF)
Agenda

- Introduction – Participants and Contributors
- A World of Challenges
- Scenario and Architecture Overview
- GEOINT Interoperability Demonstration
- Questions and Wrap-Up
GEOINT 2004 Interoperability Demonstration Participants...

Major Contributors...

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To respond to today’s challenges, the GEOINT community needs to be able to discover and dynamically connect to many different information sources.

Use Techniques and Cultures of the Internet.

Access Multiple Sources through the standards-based “dial-tone” of the Geospatial Web.
Intelligence Problem – Threat Against an Airport

Highlights Online “GEOINT Services” Supporting:
- Discovery
- Access
- Analysis
- Self-Service
What You Will See

Step 1 - Tip Comes In
Step 2 - Plug into the Geospatial Web
Step 3 - Discover GEOINT
Step 4 - Add GEOINT via Analysis Tools
Step 5 - Task Satellite Imagery Collection
Step 6 - Task Tactical Sensor Collection
Step 7 - New Tip Comes In
Step 8 - Self-Service, Collaboration and Analysis
Step 9 - Portal and Collaboration
Step 10 - Mission Planning
Services Architecture for GEOINT – Powerful GEOINT Broker/Trading Capability

Common Services Framework
- HTTP, XML
- ISO 19128, ISO 19115, 19139
- ISO 19119 (Services Metadata)
- OGC Context, WFS, WCS, SLD
- Geography Markup Language (GML)
- OGC Catalog Interface
- EPSG Coordinate Database
- GEOTIFF, JPEG, PNG, others
- JPEG 2000
- WSDL, SOAP, UDDI
- JSR 168

Based on Standards Listing For US National System for GEOINT
Focus on Key Standards for GEOINT Services

GEOINT Data Content Specifications
- ISO/OGC Web Map Server
- ISO/OGC Web Feature Server
- OGC Web Coverage Server
- OGC Catalog Services
- ISO/OGC Geography Markup Language
- ISO 19115 (Metadata for GEOINT)
- Coordinate Referencing
- ISO JPEG2000

Web Services Description Language, Simple Object Access Protocol,
exxtensible Markup Language, Hypertext Transfer Protocol, Others (.NET, J2EE)

Focus on the Key Elements of the Standards that enable GEOINT Operations

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## Why Does Standardization Matter for GEOINT Systems?

<table>
<thead>
<tr>
<th>2000</th>
<th>2005</th>
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<tbody>
<tr>
<td><strong>Support to Analyst</strong></td>
<td>Case by Case</td>
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<tr>
<td><strong>Information Distribution</strong></td>
<td>Files, CDs &amp; Hardcopy</td>
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<td><strong>Production Paradigm</strong></td>
<td>Product-Centric</td>
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<td><strong>Tradecraft</strong></td>
<td>Imagery &amp; Mapping</td>
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<td><strong>System Complexity</strong></td>
<td>Complex</td>
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<td><strong>Time to Integrate</strong></td>
<td>Months</td>
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<td><strong>Services-based</strong></td>
<td>More Web-based</td>
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<td><strong>Data-Centric</strong></td>
<td>Integrated GEOINT</td>
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<tr>
<td><strong>Elegant Simplicity</strong></td>
<td>Days to Hours</td>
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Data and Service Providers in this Demonstration are Globally Distributed
Demonstration Workflow

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Situation Report

11 Oct 2004, 1100 ET

Step 1: Tip Comes In

Updated status. Intercepts indicate radicals are focusing on Oceania International Airport. Radicals’ traffic indicates attempts to assess staging area for planned activities. Traffic suggests small team carrying man-portable devices. Staging area requirements include a field of view of runways and flight approach/departure vectors.

Overview

Online Maps are also available at the GECINT Interoperability Portal.
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GEOINT Discovery Service
Accesses Multiple Sources through GEOINT Portal
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‘Fly’ into Area of Interest
Please Extract Tunnel and Runway Features

Identify GEOINT Needs
Access GEOINT from ‘Coverage’ Service
Modular Connector that can run on any System, providing access to GEOINT Services
Connect to GEOINT Service and Get Imagery
Identify GEOINT Needs

Please Extract Tunnel and Runway Features

Place the text label on the terrain. Right click or Finish button to finish operation.
Set up Automated Feature Extraction

Please Extract Tunnel and Runway Features
Extract Road and Airport Features
‘Transactional’ Feature Service Connector for ArcGIS Desktop
Access GML from Feature Service
Combine GML with Roads Information
Combine GML with Roads and Parks Information (unsecure areas)
Actual GML!
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STK GML Reader uses GML Points to Plan Satellite Imagery Collection
STK GML Reader uses GML Points to Plan UAV Imagery Collection
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New Situation Report

11 Oct 2004, 1200 ET

Step 7: Tip Comes In -

Updated status: Additional intercepts indicate radicals are looking at fuel storage areas at Oceana International Airport. Traffic indicates radicals are attempting to determine ingress/egress routes to fuel storage areas. Radicals also appear to be attempting to access schematics of fuel tanks at the facility. Traffic suggests additional small teams are working on this plan.

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GEOINT Self-Service

GEOINT Standards support a “window” that can be directed anywhere, pulling multiple sources together for analysis and decision making.
Self-Service to GEOINT Imagery Data
Collaborate on Medium-Resolution Map Base, Identify GEOINT Needs
GEOINT Fusion, establish area for additional monitoring...
Using attributes of features to categorize search area, automatically.
Buffer Zone established...enable multi-INT search
ELINT Hits near Tank 5...
Packaged up GEOINT Analysis for offline field use
Demonstration Workflow

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Step 10 - Conduct Mission Planning
Refresh packaged up GEOINT as needed (GML Rocks)
Refresh packaged up GEOINT Analysis as needed for offline field use
Access VMAP Level 0 Using Feature Service and GML
Open JPIP Image

Server Connection
- Server: localhost
- User Name: 
- Password: 
- Clear History
- Specify server or server:port

Save Settings
- None
- User Name Only
- User Name And Password

Connect To Server

Folders
- Root Folder

Files
- QuickBird_03SE...
- QuickBird_04FE...
- S35-E150_ll.jp2

Size: 575198 KB
Date: 04/09/2006 05:59 PM

Size: 517025 KB
Date: 04/09/2006 11:43 PM

Size: 480865 KB
Date: 02/09/2006 11:04 PM

Cache Directory
- Open
- Cancel
Using ITT Image Access Solution we are able to stream a 550 mb JPEG2000 image from a wireless connection to the PDA in seconds over low bandwidth networks typical of a tactical user in the field.
Laptop client drives the imagery to the PDA and interacts with the imagery on the PDA wirelessly allowing the user to ZOOM, PAN, ROAM, and ANNOTATE the Image.
What Did You Just See?

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Summary

- Techniques and Cultures of the Internet
  - Online Workflows Support Key GEOINT Processes
- Services Enabled by Standards
  - Standards are the Basis for any Emergent Technology
  - Enable Multiple Vendors to Work Together
  - Support GEOINT Discovery, Access and Self-Service
  - GEOINT Standards are becoming critical to business and mission needs
- Speed of Integration - From Months to Days
- Next Steps – Applying GEOINT Standards and Services
  - Improving standards development and delivery

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<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
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<tbody>
<tr>
<td></td>
<td>GEOFINT Demo Development</td>
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