Quality Lands, Quality Soldiers

Implementing ArcIMS in a Multi-Tiered Unclassified Security Environment

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• Introduction
• Background
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• Conclusion
• Questions/Answers
• Goal of Integrated Training Area Management (ITAM), GIS Program is to deliver accurate training area management geospatial data for its customer, the U.S. Army Europe.
• Challenge is to deliver disparate data in an un-classified multi-layered secure network environment.
• This paper presents the technical integration of ArcIMS, ArcSDE, and Oracle8 with other secure web technologies that utilize SSL, PKI Certificates, and Web portal access points to facilitate an efficient and effective distribution of GIS data.
• The 7ATC ITAM Program is utilizing this GIS technology to better manage and operate training areas in Europe.
Integrated Training Area Management

Implementing ArcIMS in a Multi-Tiered Un-Classified Security Environment

Background:

- Integrated Training Area Management, United States Army Europe (USAREUR) is an environmental arm of the Department of the Army.
- The ITAM Program is the Army's formal strategy for focusing on sustained use of training and testing lands.
- ITAM integrates elements of operational, environmental, master planning, and other programs that identify and assess land use alternatives.
- ITAM USAREUR has taken on the goal of delivering accurate training area management geospatial data to its customers.
Integrated Training Area Management

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Background (continued)

- USAREUR consists of over 10 Major training installations w/ Sub training areas.
- Over 160,000 Acres of land to manage.
- ITAM falls under Training Support Activity Europe (TSAE)
- With TSAE and DA backing ITAM has put together a integral GIS system that serves all of the US Army in Europe.
Integrated Training Area Management

USAREUR ITAM
10 installations; ~ 160,000 acres
ArcIMS Technological Integration

- Scope of IMS project
- Hardware Installation
- Software Installation
- Security Configuration
ArcIMS Technological Integration

- ArcIMS Scope of work
  - Audience of site is determined
  - Data is gathered for loading
  - Standards are set for web page templates
  - Look and feel is determined for functionality
  - ESRI is contracted for custom tailoring of web site
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ArcIMS Technological Integration

• Hardware Installation
  – Dell PowerEdge 2550: Dual Intel PIII 933Mhz Processors
  – 5-73GB SCSI Hard drives
  – 1.4Gb of RAM
  – Dell Powervault 230 External Storage Device
  – DLT 7000 TapeBackup Library System
  – APC UPS 3000 Battery Backup Device
  – Dell 42 U Rack for all components w/ room for additions
ArcIMS Technological Integration

- Software installation
  - Windows 2000 Server
  - Windows IIS 5.0
  - Norton Antivirus – Corporate Edition
  - Oracle 8i v 8.1.7.4.9
  - CA’s ArcServe TapeBackup Software
  - ArcSDE
  - ArcIMS
ArcIMS Technological Integration

• Security Configurations
  – USAREUR Security Baselines based off of Microsoft standards for MS Windows 2000 Server and IIS 5.0
  – Required installation of Public Key Infrastructure, Secure Socket Layer, and Port 443 technologies to be allowed on the DOD network
  – DOD port registration for routers and gateways outside of local area network
  – Network Intrusion Scanning performed on a scheduled basis with reporting
  – Mandatory compliance with Information Assurance Vulnerability Alerts (IAVA’s) - or be shut off from the network
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ArcIMS Technological Integration

- **Software Configuration**
  - Windows 2000 Server
    - OS configured to handle demand of web users, data loading, and local user access
  - Windows IIS 5.0
    - Web Server configured to handle web user load
  - Oracle 8i v 8.1.7.4.9
    - Configured for ESRI ArcSDE Standards
  - ArcSDE
    - Configured and tested to ESRI Standards for data loading and ArcIMS data handling
  - ArcIMS
    - Configured by ESRI standards to serve up the data that is requested by users and the web site
ArcIMS Technological Integration

• Data Loading for ArcSDE
  – Using command line and ArcCatalog, 120+GB of data is loaded into ArcSDE-Oracle
  – Data format that is loaded into ArcSDE is both in Raster Catalog format as well as regular SID format
  – JPEG 75,50, and LZ77 were tested for quality and performance
  – Testing of quality of the data determined JPEG 75 and LZ77
  – ArcCatalog was used to determine draw speeds and resolution
ArcIMS Technological Integration

- ArcIMS configuration
  - Installation and configuration of the Servlet Connector New Atlanta Servlet Exec proves to be critical to ArcIMS
    - One issue encountered was the wrong version of Java Environment/JVM installed on server
    - Resolved by using ESRI Standards JRE 1.4.0 or 1.3.1_02 can be used
Integrated Training Area Management

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ArcIMS Technological Integration

Image courtesy of ESRI "ArcIMS 4 Architecture and Functionality" White Paper April 2002
Integrated Training Area Management

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ArcIMS Technological Integration

- ArcIMS – ArcSDE 8.2 Connections

Image courtesy of ESRI “ArcIMS 4 Architecture and Functionality” White Paper April 2002
ArcIMS Technological Integration

• ArcIMS configuration
  – ArcIMS Administrator
    Map Servers/Services
    • Configuration of the Virtual Image Server
    • Utilize Image and Metadata Services
    • Currently use 16 services for 8 UTM/Lat-Long Zones
    • Takes up to 10 minutes to start
    • Test, Test, Test services before implementing
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ArcIMS Technological Integration

- ArcIMS configuration
  - ArcIMS Author
    - Used for creating AXL files
    - We edit most AXL files to tailor to our needs
    - Advantage of not having to generate code by hand
    - Easy to use, for the most part
    - Will not recognize Raster Catalogs
    - Solution: Enter a shape file into the Raster area
    - Test, test, test…
Integrated Training Area Management

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ArcIMS Technological Integration

- ArcIMS configuration
  - Launch your services and check for errors
  - See what is wrong and fix for public deployment
  - Utilize ESRI’s support page for answers
    - Post question to discussion forums
    - Free, mostly accurate help from Admins like you
      http://www.support.esri.com/
ArcIMS Technological Integration

- ITAM WEBSITE
  - 82,000 + Hits to our site a avg/month
  - Officially up for two months-out of beta
  - .Mil network users
  - USAREUR visitors
  - Draw times are comparable to ArcCatalog
  - Speed is about 5 seconds for boundaries, 10-15 seconds for ortho imagery
Trend Analysis

This tool allows you to compare historical images of various training ranges.

First, select the layer that will be on the bottom of the view.

Select the Swipe Image tool.
Move your mouse over the map image (right frame) to compare top and bottom images.
ArcIMS Future

- ITAM WEBSITE
  - Enable more MetaData functionality
  - Line of sight analysis
  - Fly thru technology, i.e. TerraExplorer
  - Special access for different data
  - What technology will be able to deliver
Conclusion

• ArcIMS can be a dynamic way of delivering data to the end users. If utilized properly.
• It was not an easy implementation.
• Much planning and preparation is needed
• Consult with the experts, ESRI, if you can
• Have fun with the technology
Question - Answer Session
THANK YOU!
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