Presenting your data with ArcGIS Server

GIS Colorado Meeting
Friday, July 25, 2008

animasgeographictechnology, Inc.

Animas Geographic Technology

- GIS firm in Durango (since 2002)
  - Aaron Robinson, public and private sector GIS work since 1994
  - Mark Jones, private sector software development since 2002
  - Denise Pruett, technology project management since 1998
- ESRI Business Partner
  - Consultant
  - Developer/OEM
  - Software Reseller
- Business Focus
  - Planning & Implementation
  - Systems Integration
  - Application Development (Desktop, Mobile, Web)

4 Topics

- Distributed GIS
  - Serving data and tools to many users
- One Approach
  - Web → ArcGIS Server
- Recent Project
  - Montezuma County
- Lessons Learned
  - Performance & Development

GIS Delivery Challenges

- Network
  - LAN, WAN, Intranet, Internet (1000mbps - 56kbps)
- User Groups
  - GIS and computer knowledge varies widely
- Software
  - License & maintenance cost can be expensive
- Data Currency
  - Consistently providing the latest and greatest data
- Interface
  - Easy-to-use interface that still provides desired robust functionality
- Flexibility
  - Not always easy to add, remove, or modify functionality
- Scalability
  - Supporting many concurrent users
  - Integrating many data sources (many formats, many locations)

ArcGIS Server Advantages

- Network
  - Performs well on a range of connection speeds
  - Important to build application for throughput
- User Groups
  - Targeted applications for individual user groups
  - Minimal training (depending on implementation)
- Software
  - As many clients as your hardware can support
- Data Currency
  - Ability to publish current GIS data from your geodatabase
  - Ability to publish content from tabular databases and file system

ArcGIS Server Advantages

- Interface
  - Web Application Development Framework (ADF) supplies intuitive user interface objects (map, table of contents, scale bar, etc.)
  - Customize where Web ADF does not meet your user needs
- Flexibility
  - Web ADF allows modular development
  - Add, change, remove functionality as needed
- Scalability
  - Supporting many concurrent users
  - Ability to integrate content from tabular databases and data from the file system as needed

ArcGIS Server Demonstration

- Service Types
  - Map (MXD), Globe
  - Geoprocessing, Geocoding, Network Analysis
  - Geodata (GDB replication), Mobile
- Consumed by application layer
  - Web or Mobile
- Steps to delivery
  - Publish, Manage, End-User Application

ArcCatalog - ArcEditor - \\agsdev1\agsroot\mon\agsdata

File Edit View Go Tools Window Help

Location: \\agsdev1\agsroot\mon\agsdata

Unregister As Versioned

Catalog
- C:\
- P:\
- T:\
- \\agsdev1\agsroot
  - hsd
  - lap
  - mon
    - agsapp
    - agsdata
- \\geodev1\gis
- ArcWeb Services
- Coordinate Systems
- Database Connections
- Database Servers
- GIS Servers
  - Add ArcGIS Server
  - Add ArcIMS Server
  - Add WMS Server
  - 216.204.207.68
  - agsdev1 (admin)
  - agsuser on agsdev1
  - arcgisserver
  - arcgisserver (admin)
  - arcims-prod.hillsboroughcounty.org
  - arcims.ci.harrisonburg.va.us
  - arcims.laplata.co.us
  - chelly
  - Geography Network Services hosted by ESRI

Contents | Preview | Metadata

Name	Type	Size	Modified
MontezumaGIS.gdb	File Geodatabase	25.52 MB	7/24/2008 4:11:48 PM
Montezumasp.sid	Raster Dataset	1.35 GB	5/12/2008 8:28:11 PM
ortho_1-1_1n_s_co083_2005_2.sid	Raster Dataset	1.64 GB	7/17/2008 9:04:00 PM
WebMap_Aerial.mxd	Map Document	417 KB	7/17/2008 9:40:18 PM
WebMap_Basi	ument	723 KB	7/17/2008 9:40:30 PM
WebMap_Basi	ument	591 KB	7/21/2008 6:00:58 PM
WebMap_Basi	ument	653.50 KB	7/17/2008 10:17:13 PM

Copy Ctrl+C
Delete
Rename F2
Set Data Source(s)...
Publish to ArcGIS Server...
Properties...

Publishes your items to an ArcGIS Server.

Publish to ArcGIS Server

Choose the ArcGIS Server you wish to publish to:

ArcGIS Server: agsdev1

Service Name: WebMap_Aerial

Publish to folder

- (•) Use an existing folder
  - Folder Name: agsdev1 (root)
- ( ) Create a new folder
  - Folder Name:

< Back | Next > | Cancel

ArcGIS Server Manager - Windows Internet Explorer

http://agsdev1/arcgis/manager/Services/Default.aspx

File Edit View Favorites Tools Help

ArcGIS Server Manager

ArcGIS Server Manager
sharing geographic information

Logged in as agsdev1\robinsona - Thursday, July 24, 2008 4:37 PM
Settings | Help | Logout

Home | Services | Applications | GIS Server

Folders

Add | Delete | Properties

AGSDEV1

Services in AGSDEV1 (root) <<1 - 4 of 4>>

Publish a GIS Resource | Add New Service

Start | Stop | Pause | Delete

	Name	Type	Status	Instances (In Use/Running)	Edit
+	hsd	Map Service	Stopped	0/0	
−	LAP	Map Service	Started	0/2	
+	WebMap_Aerial	Map Service	Started	0/2	
+	WebMap_Basic	Map Service	Started	1/3	

Description:
Source: \\agsdev1\agsroot\lap\agsdata\LAP.mxd
Capabilities:
Pooling: Not Pooled

<<1 - 4 of 4>>

Related Help Topics

- Publishing a GIS resource to the server
- Tutorial: Publishing a map service
- Adding a new service
- Organizing services

Done | Local intranet | 100%

ArcGIS Server Manager - Windows Internet Explorer

http://agsdev1/arcgis/manager/Applications/Default.aspx

File Edit View Favorites Tools Help

ArcGIS Server Manager

ArcGIS Server Manager
sharing geographic information

Logged in as agsdev1\robinsona - Thursday, July 24, 2008 4:37 PM
Settings | Help | Logout

Home | Services | Applications | GIS Server

View

Web Applications
ArcGIS Explorer Maps
KML Network Links
WMS Services

Related Help Topics

Working with applications in Manager
Tutorial: Creating a Web application
Managing ArcGIS Explorer maps
Managing KML network links
Viewing WMS services

Web Applications << 0 - 0 of 0 >>

Create Web Application

Name	Author	Date Modified	URL

<< 0 - 0 of 0 >>

There are no Web applications available.
Click Create Web Application to create one.

Local intranet 100%

agsapp - Microsoft Visual Studio

File Edit View Website Build Debug Format Layout Tools Window Community Help

XHTML 1.0 Transitional (

web.config | Default.aspx | Start Page

Toolbox | Server Explorer

Tasks

Root
Root
Root
Root
Root

Results

TaskResults1
Task Results WebControl

Map Contents

TreeViewPlus Toc1
Table of Contents WebControl

ScaleBar1
ScaleBar WebControl

2x

Design | Source | <body> | <form#form1>

Immediate Window | Error List | Task List | Output | Find Results 1 | Find Symbol Results

Solution Explorer - \\agsdev1\AG...

\\agsdev1\AGSRoot\lap\agsapp\

App_Code
App_Data
App_Themes
Help
images
javaScript
ApplicationClosed.aspx
Default.aspx
ErrorPage.aspx
Global.asax
Measure.ascx
ReadMe.txt
web.config
Web.sitemap
WebMapApp_VB.ico

Solution Explorer | Team Explorer

Properties

DOCUMENT

Theme
Trace
TraceMode
UICulture

Body

ALink
Background
BgColor

ALink
Color of all active links in the document.

New Web Site

Templates:

Visual Studio installed templates

ASP.NET Web Site | ASP.NET Web Service | Personal Web Site Starter Kit | ASP.NET AJAX-Enabl... | Empty Web Site | ASP.NET Crystal Re... | Web Mapping Application

My Templates

Search Online Templates...

Template for Web Mapping Application

Location: File System | \\agsdev1\AGSRoot\lap\Web Mapping Application1 | Browse...

Language: Visual Basic

OK | Cancel

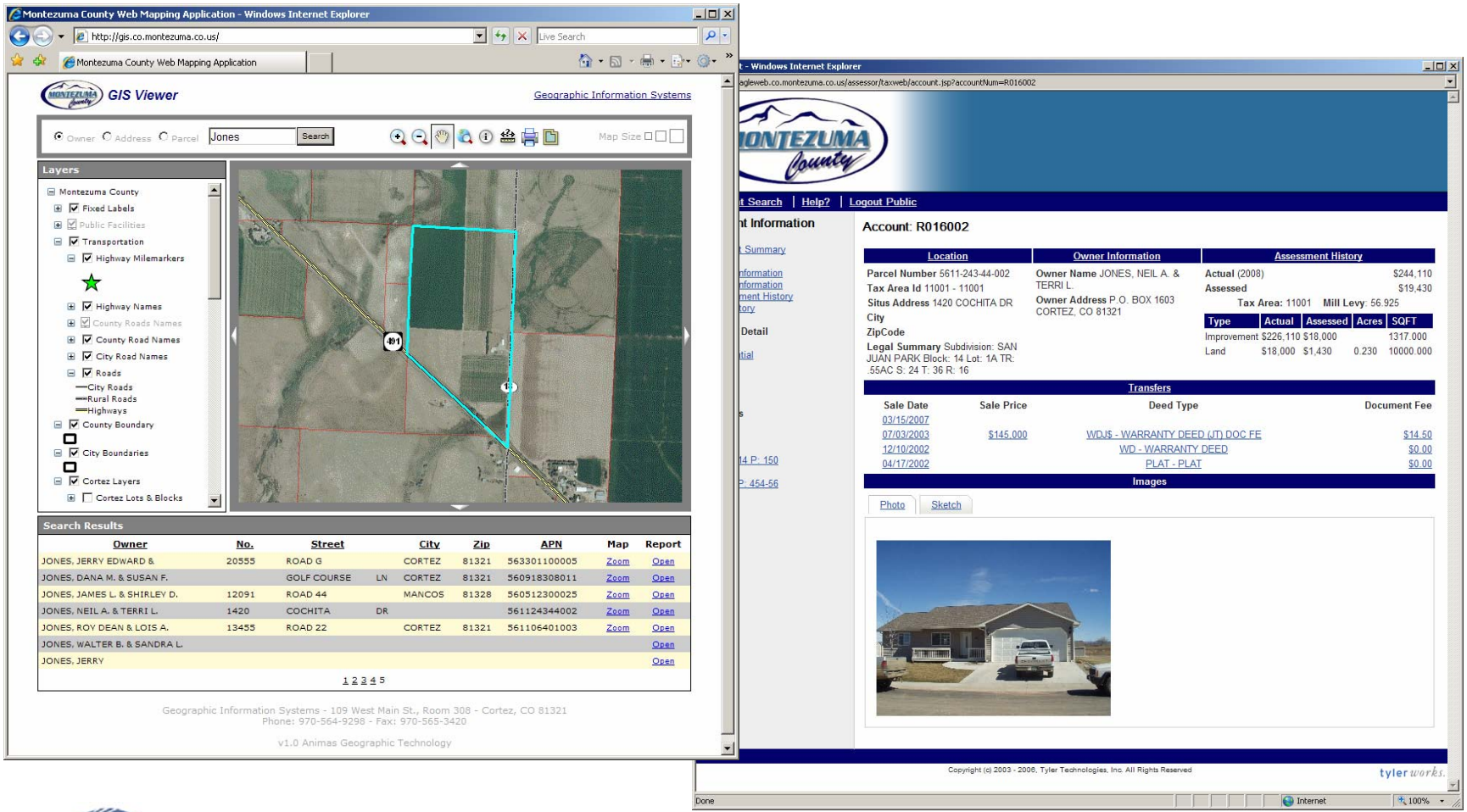
Montezuma County GIS

- Existing Situation
  - Already have hardware and software
  - Good current GIS data is available (Personal GDBs)
  - Desktop GIS used in-house to edit and view (ArcGIS, ArcReader, ArcView 3.2)
- Challenges
  - No easy way to provide public access to the GIS
  - Limited in-house resources to install, configure, and develop a custom web-based solution
- Solution
  - AGT & Montezuma worked together to:
    - » Install and configure ArcGIS Server
    - » Develop a custom GIS viewer to meet Montezuma County's service goals

Montezuma County GIS

- Benefits
  - Easy to provide public access to the GIS information
  - Ease of integration with ArcGIS Desktop
    - » ArcGIS Desktop is already in use by County GIS staff
    - » Able to manage ArcGIS server from web interface or ArcCatalog
    - » Able to author map services using ArcView (ArcEditor & ArcINFO) by publishing an MXD
  - Streamlined workflow (GIS and tabular data updates)
    - » Updates handled through ArcCatalog and MS Access
  - Provides a baseline for further development
    - » Intranet and Montezuma LAN
    - » Internet

Montezuma County GIS Demo



Lessons Learned

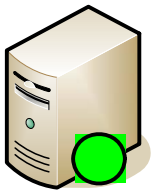
- Development
  - Foundation in ASP.NET, HTML, JavaScript, and ArcObjects
  - AJAX (Asynchronous JavaScript and XML) Toolkit
    - » Dynamic page updates, no page post
  - Microsoft's AJAX 1.0 suite is not easily compatible with ESRI Web ADF 9.2
    - » Can be done by coding handler routines
  - AJAX integration fixes at ArcGIS Server 9.3
  - Using Microsoft "GridView" controls for tabular results requires more than MSDN suggests
    - » Update Panel & Script Manager
    - » Grid View Properties
    - » Registering asynchronous post back controls

Lessons Learned

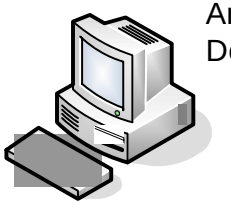
- Performance
  - Budget adequately for equipment
    - » Limiting factors → Processor, memory, disk I/O
  - Optimize map symbology
    - » Avoid symbology and labels that are "expensive" to render
  - Build a map cache for "static" data
    - » Very time and processor intensive – plan accordingly
  - System configuration options

System Configuration Options

Single Machine

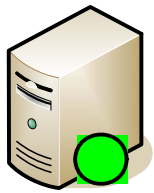


Web Server
Web ADF
SOM
SOC*



ArcGIS
Desktop

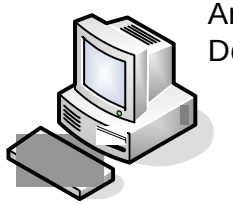
Multiple SOC



Web Server
Web ADF

SOM
SOC*

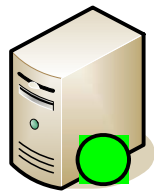
SOC*



ArcGIS
Desktop

Development

Visual Studio 2005
VS Web Server
Web ADF (Runtime & SDK)
ArcGIS Desktop
Windows Terminal Server



Web Server (IIS)
Web ADF (.NET)
SOM
SOC*

SOM = Service Object Manager
SOC = Service Object Container
* Requires ArcGIS Server Authorization File

Montezuma County IT/GIS

- Rob Peterka, IT Manager
  - Recap of problems faced
  - Why ArcGIS Server made sense for us
  - Other project observations
- Doug Roth, GIS Specialist
  - How ArcGIS Server helps the county meet public needs
  - How our GIS workflows have been improved via ArcGIS Server
  - Other project observations

Questions?

For more information:

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- Doug Roth, GIS Specialist
  - droth@co.montezuma.co.us

AGS Editions & Levels

- **Editions (Functionality)**
  - **Advanced**
    - » shared access to data, data management
    - » mapping, analysis, publishing services, web services, web applications
    - » web editing
  - **Standard**
    - » shared access to data, data management
    - » mapping, analysis, publishing services, web services, web applications
  - **Basic**
    - » shared access to data, data management

- **Levels (Capacity)**
  - **Enterprise**
    - » unlimited number of users (direct connect or application server), DBMS support for IBM DB2, IBM Informix, Microsoft SQL Server, and Oracle, no data or memory limits.
  - **Workgroup**
    - » 10 direct connect users, data limit of 4 GB, embedded DBMS (Microsoft SQL Server Express)