12.3 Using Open GIS web services to serve environmental data

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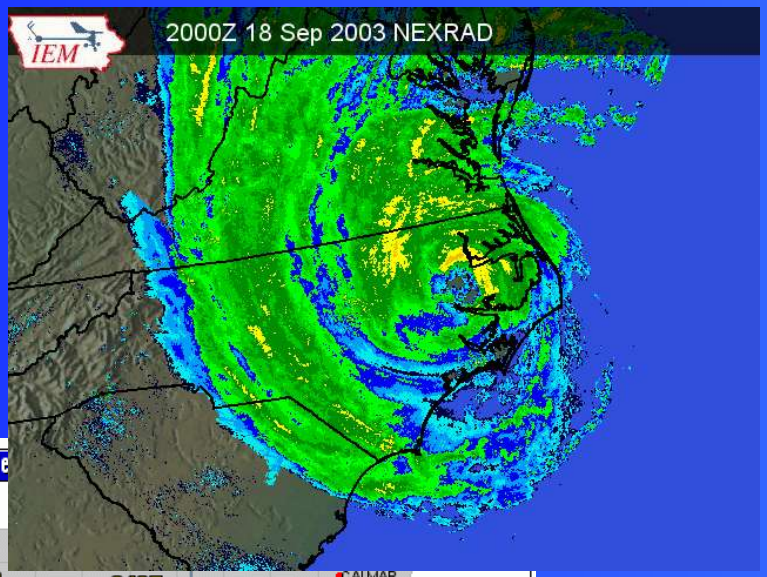
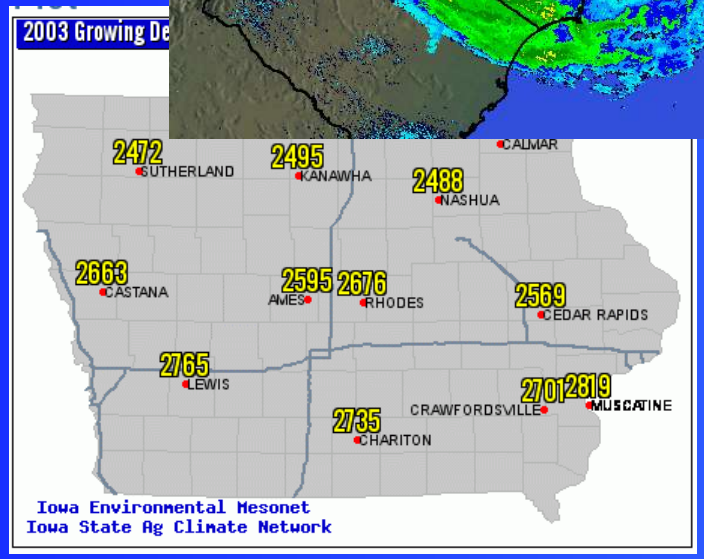
Our GIS Session History

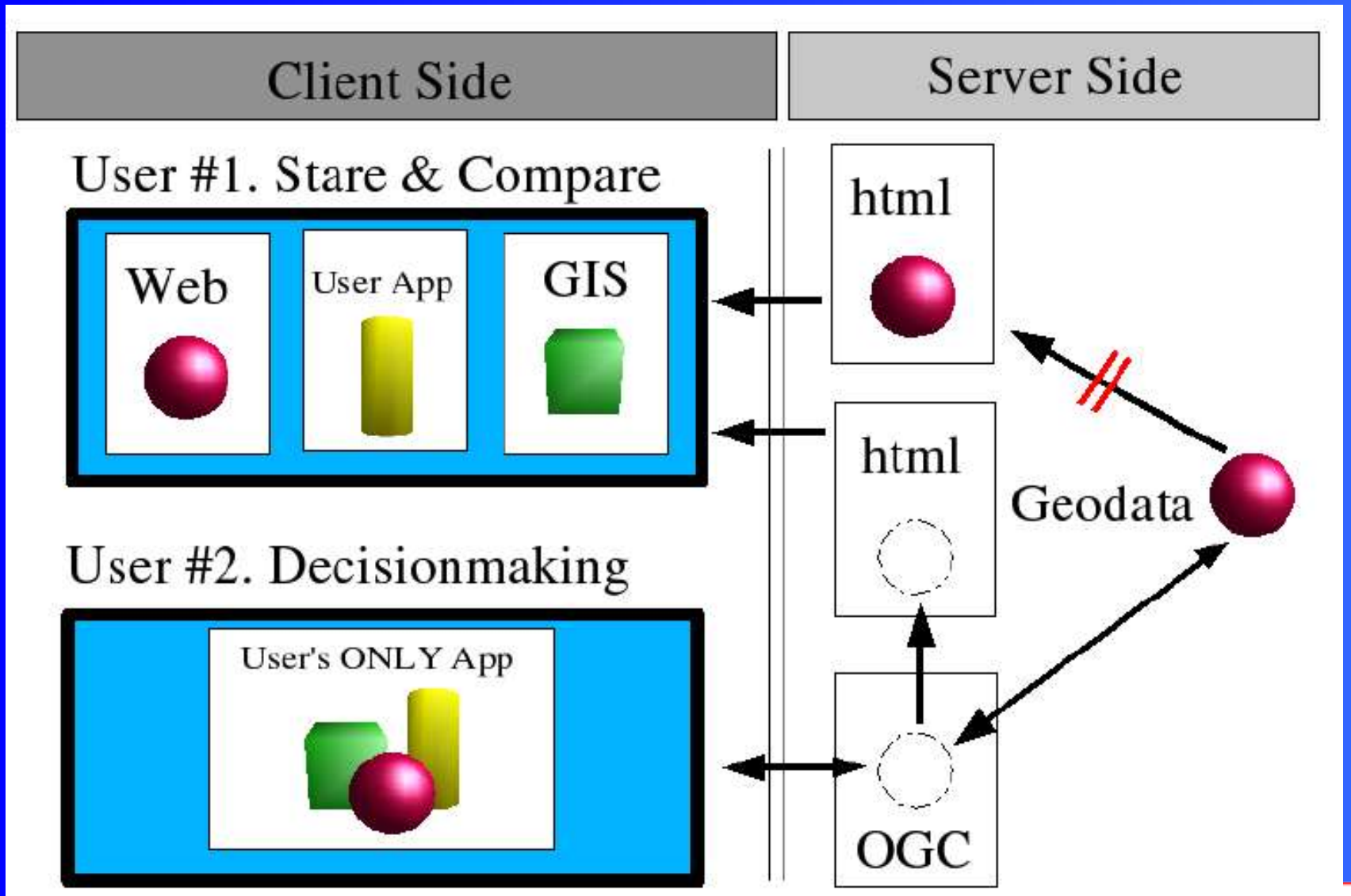
- 2003: Getting our data into GIS accessible formats. Spatial Databases
- 2004: GIS Web Mapping. Applications with NEXRAD information.





The rundown for 2005!

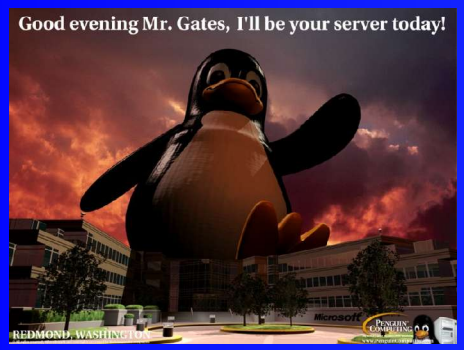
- Motivation
- Overview of OGC web services (WMS,WFS,WCS)
- IEM web service offerings
- Example implementations
- What we have learned


Client Side
Server Side
User #1. Stare & Compare
Web
User App
GIS
User #2. Decisionmaking
User's ONLY App
html
html
Geodata
OGC

The Software Components

PostGIS – Spatial datablade for the PostgreSQL RDBM

MapServer – Extremely fast and capable internet mapping server also supporting WFS,WMS,WCS



Linux – What else would you build your enterprise data system on?

WMS: Web Map Service

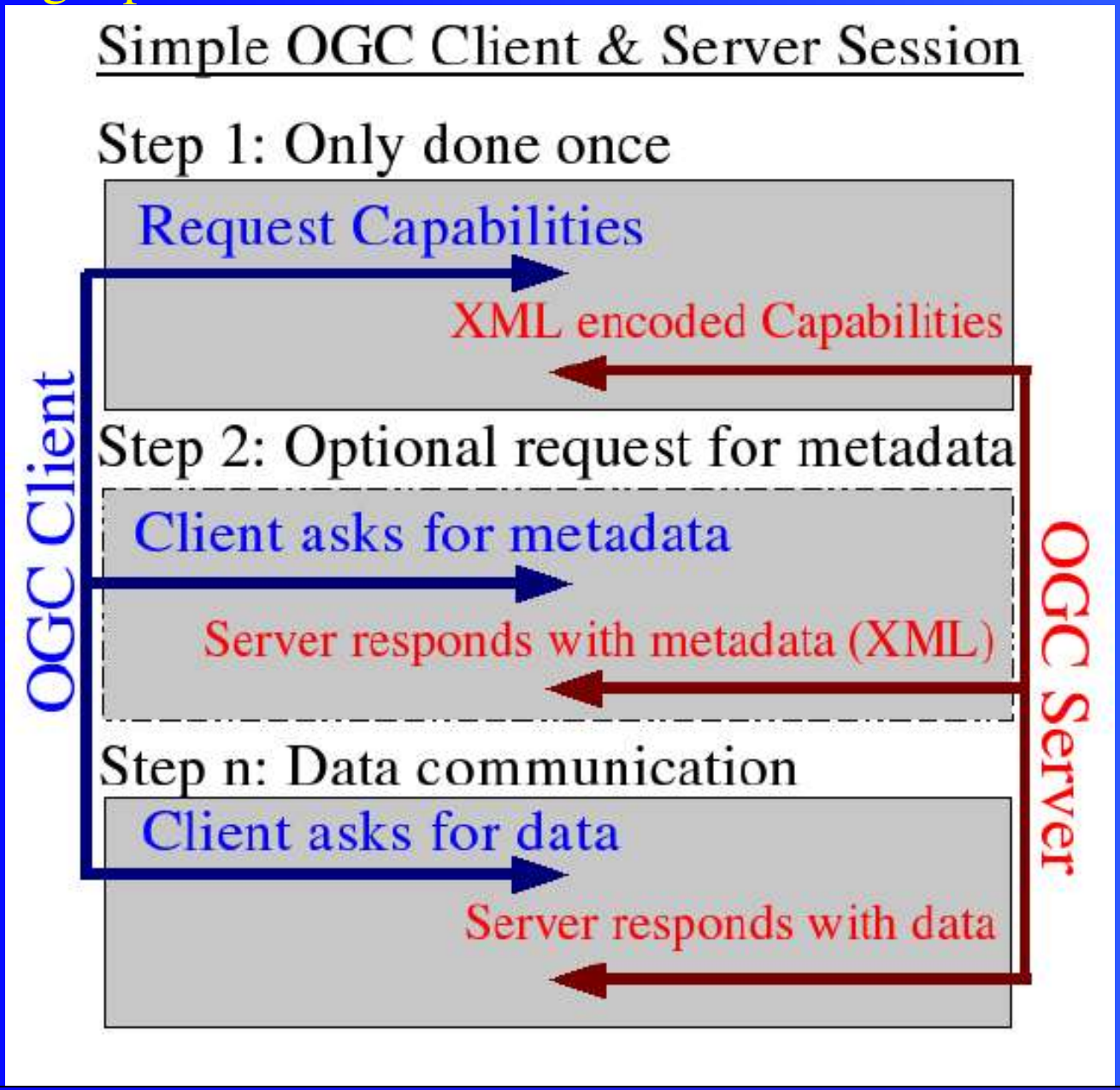
- "A WMS produces maps of spatially referenced data dynamically from geographic information." - from OGC WMS 1.3
- WMS defines three operations protocols
  - GetCapabilities
    - Get server capabilities
  - GetMap
    - Returns a map or an exception
  - GetFeatureInfo (Optional)
    - Mechanism to do pixel queries on GetMap generated maps

WFS: Web Feature Service

- "[WFS] proposes interfaces for describing data manipulation operations on geographic features using HTTP" – OGC WFS 1.0
- Data manipulation operations include
  - Create a new feature instance
  - Delete a feature instance
  - Update a feature instance
  - Get or query features based on spatial constraint

WCS: Web Coverage Service

- "WCS supports electronic exchange of geospatial data as 'coverages' " – OGC WCS 1.0
- A WCS provides three operations
  - GetCapabilities
  - GetCoverage
  - DescribeCoverage


Simple OGC Client & Server Session
Step 1: Only done once
Request Capabilities
XML encoded Capabilities
Step 2: Optional request for metadata
Client asks for metadata
Server responds with metadata (XML)
Step n: Data communication
Client asks for data
Server responds with data
OGC Client
OGC Server

IEM OGC Offerings

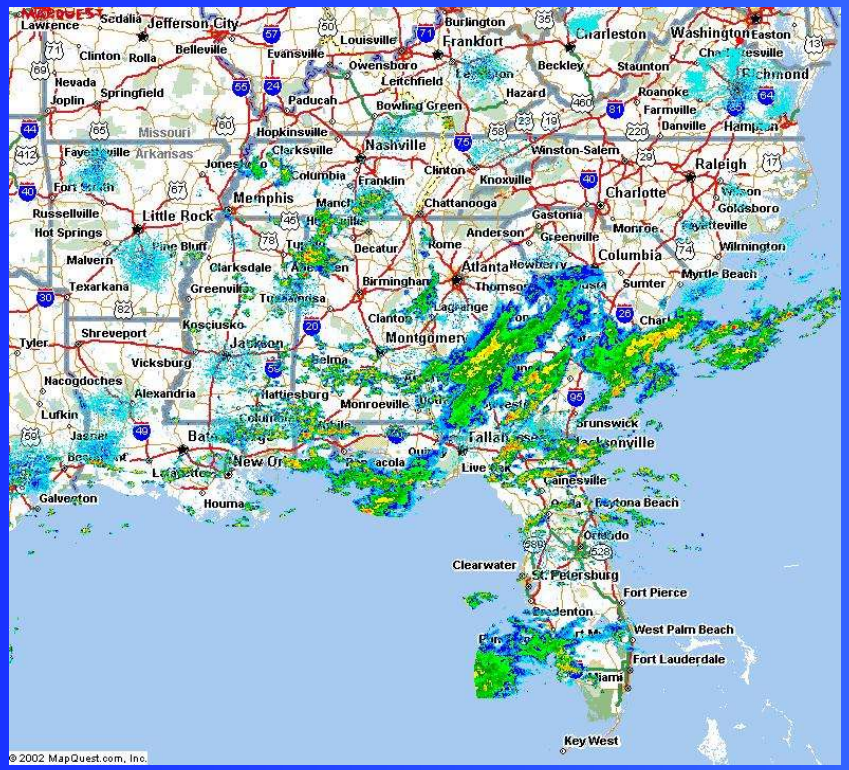
http://mesonet.agron.iastate.edu/ogc/

	WMS	WFS	WCS
CONUS NEXRAD (Base Reflect, Storm Precip)	X		? X ?
NCEP Stage4 Precip (Iowa)	X	X	
Iowa Road Conditions	X	X	
NWS Current/Archived Warnings (County + Polygon)	X	X	

Supporting 2004 Hurricanes

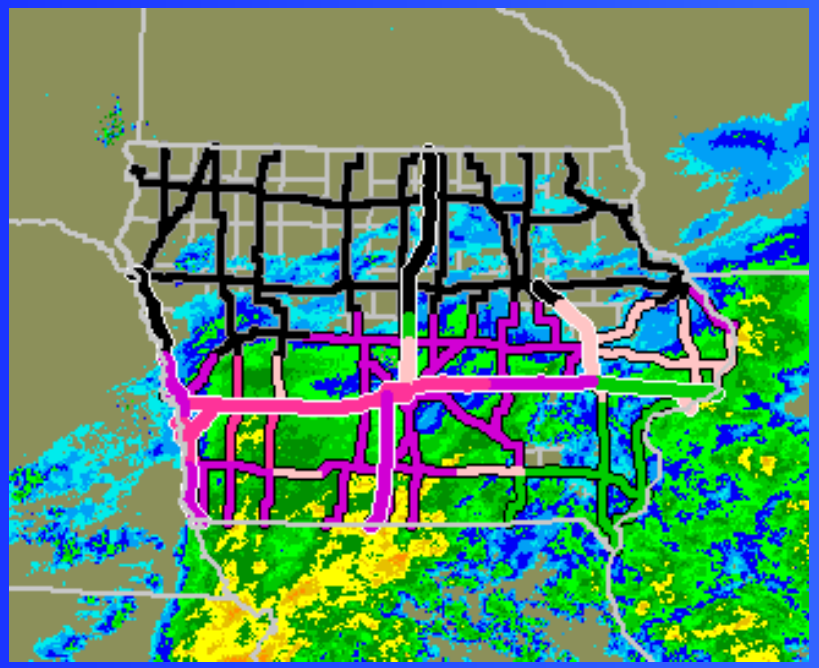
Provided Disaster Management Interoperability Services a RADAR WMS to support their decision support software

http://www.cmi-services.org



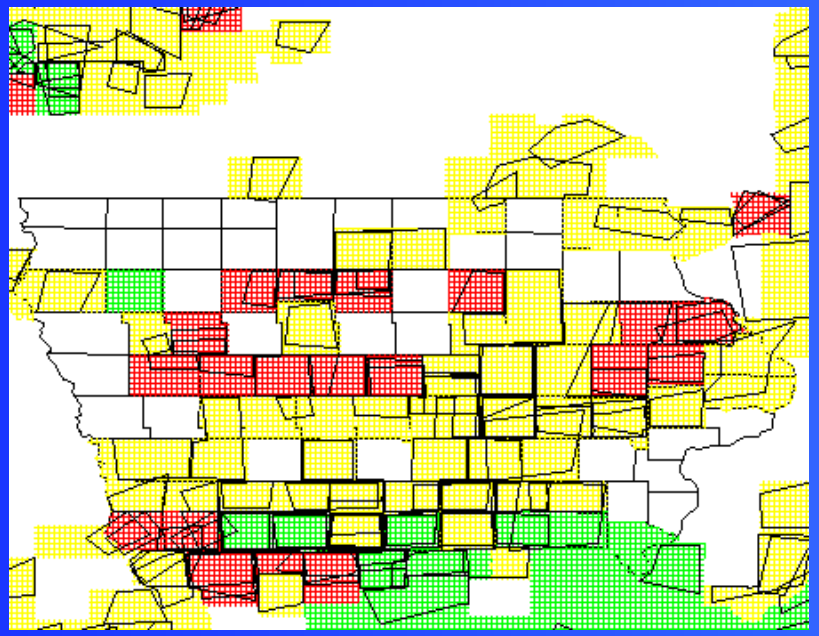
Providing Road Conditions to Media Outlets

- WFS and WMS support generation of images for display in TV Weather graphics systems



NWS Warnings WFS

- Retrieve current and historical NWS warnings (polygon and county based).
- Archive begins Jul 2002



Lessons Learned

- OGC webservices greatly reduced chaos on our server. Chaos being:
  - Redundantly storing data for different apps
  - Versioning issues with redundant data
  - Redundant code to simply add a RADAR layer to a map
- The application development time reduced
- Performance hit was remarkably small

More Lessons Learned

- Often, the performance bottleneck is the overhead of HTTP
- The client application/implementation is absolutely key
  - Example: No WFS support for ArcGIS9 (?)
- (Daryl's 2 cents) The OSS community needs to generate some killer OGC desktop interfaces and scripting libraries. [PyOGCLib a start?]

Time for Questions?

mesonet.agron.iastate.edu

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