ORACLE SPATIAL AT IOWA DOT

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HISTORY

- “High and Low Roads to GIS Development” Bijan Azad - Beirut, Lebanon 1997
- 1998 combine business data
  - Road data stored in IDMS
  - Centerlines Stored in MicroStation
- Deployment of centralized in MicroStation with direct connection to Oracle.
- Custom geometry type developed in Oracle to store MicroStation elements
- Preliminary LRS work started.
- 2001 adopted Oracle Spatial for LRS
- 2005 tied custom type road centerline to Oracle Spatial
DATABASE CENTRAL, SOFTWARE NEUTRAL

• 2005 new direction to leverage Oracle Spatial
• Cohesive environment
• Integration of data common platform for storage needed
• Oracle Spatial in place; met enterprise needs
  • Leveraged by multiple software packages
  • Works with SQL, Java, etc. at IT level
  • Flexibility in development
• MUST have web services for success
• Make data once reuse many
Database Cluster
Supports Spatial
Geospatial Web Services
Data Manipulation, Analysis, Visualization
Applications
Network
Geospatial Web Services
Database Cluster
Supports Spatial
WHY IT WORKS FOR IOWA DOT

- Flexibility
- Focus on core infrastructure
- Web Services
- Leverage technology that works with core infrastructure
- Almost unlimited opportunities
FLEXIBILITY

- Multiple instances and schemas can be created
- Tune tables, views, procedures, functions, etc at database level
  - When debugging start at DB work up to application level
- Query and analyze at any level of clouds
- Read, write, manipulate from almost anywhere and anything
FOCUS ON CORE INFRASTRUCTURE

- IT staff build knowledge around core
- Analysts build knowledge around core
- Systems build around core
- Train in SQL, Database
- Look at core first for solutions
- Make once use many
WEB SERVICES

• Leverage web based services
  • ArcGIS Server
  • Custom LRS Service (JetFire)
  • Custom Database Service (OWL)
  • Native Oracle (A3)
• Services allow other infrastructure to leverage database.
• Avoids the one off systems, silos of excellence
LEVERAGE TECHNOLOGY THAT WORKS WITH CORE INFRASTRUCTURE

- Leverage geospatial software that leverages direct connections or web services
- Try to avoid custom registrations, unless they are easy
- Don’t let software dictate design, let workflow dictate
- Work with Oracle Spatial natively
ALMOST UNLIMITED OPPORTUNITIES

- DB to Desktop
- DB to web
- DB to desktop and web
- DB to desktop and application
- Solid foundation, build anything
LOOK OUT FOR

- One Off Systems
- I like to have my own files
- Give users access on system
- Training
- Need local experts
- Need database experts
CURRENT IOWA INFRASTRUCTURE

- Oracle Enterprise 11.1 and 11.2 plus spatial on multiple servers and instances
  - 5 Oracle Enterprise Production Licenses
  - 3 Oracle Enterprise Test Licenses
  - 3 Test and Production Spatial licenses
- Oracle locator
  - ERMS, Terra Share
- Large investment upfront
- Desktop software leverages architecture GeoMedia, ESRI, transCAD, MicroStation
- Server software, ArcGIS Server, LDMx, Quick Terrain Modeler
- Iowa MLLRS runs in Oracle Spatial
DATA REGISTRATION IS NEEDED

- Tables developed in Oracle
  - If business in SQL Server, store geometry in Oracle Spatial
  - Appropriate roles, permissions
  - Universal GIS Select role
- Follow best practices for spatial development
- Register with MDSYS and create spatial indexes
- Register with GDOSYS
- Register with SDE
  - Don’t violate ESRI's Oracle spatial rules
  - Query layers? Looks promising
- Ready for use & reuse
STAFF ACCESS

• OS Authentication for users
• Service accounts for specific needs like SDE, custom direct access
• Users allowed create objects in own schema
  • Limit on space
  • Most don’t leverage
EXAMPLE  - BIRD HOUSES

• Store locations of bird houses
• Web portal for maintenance staff
• Analysis by internal staff
• Analysis by external staff
• Web service for use by other applications
NATIVE QUERIES

- select distinct full_name from IDOTLRS.ROUTEDETAIL where route_system_id = 1 and sdo_relate (geometry Ga_tw, (SELECT SDO_CS.TRANSFORM(SDO_GEOMETRY(XMLType(htpuritype (httpuritype('http://owl/wcf/1.0/Owl.svc/pox/GetCountyBorderWkt?coNum=25\&year=2007').getExternalUrl() ).getClob()).EXTRACT('//WKT/text()').getClobVal() , 8192), 1050010) FROM DUAL), 'mask=ANYINTERACT querytype=WINDOW') = 'TRUE' order by full_name;

- select sys.dbms_xmlgen.getxml('select distinct full_name from IDOTLRS.ROUTEDETAIL where route_system_id = 1 and sdo_relate (geometry Ga_tw, (SELECT SDO_CS.TRANSFORM(SDO_GEOMETRY(XMLType(htpuritype (httpuritype("http://owl/wcf/1.0/Owl.svc/pox/GetCountyBorderWkt?coNum=25\&year=2007"').getExternalUrl() ).getClob()).EXTRACT("//WKT/text()").getClobVal() , 8192), 1050010) FROM DUAL), "mask=ANYINTERACT querytype=WINDOW") = "TRUE" order by full_name') xml from dual;

- select sys.dbms_xmlgen.getxml('select POST_VALUE from IDOTLRS.REFERENCE_POST where ROUTE_ID = 16 and COUNTY_ID = 51 order by POST_VALUE') XML from dual;
DOLLAR WATERMELONS

- Does your architecture meet the mission of your organization?
QUESTIONS