Oracle Spatial Technologies: An Update

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Overview

- Oracle Approach to Market
- Specialist v. Generalist Solutions
- New Developments:
  - Oracle Database XE
  - Oracle Spatial (New & planned features)
Oracle’s Approach to Market:
Provide a powerful spatial data management platform

- **GeoSpatial**
  - Government
  - Utilities
  - Energy

- **Enterprise Applications**
  - CRM (Sales, Marketing, Call Centers)
  - ERP (HR, Supply Chain, Asset Management, Financials)
  - Tracking & Logistics (RFID, Sensor Web)
  - MapViewer Introduction
GIS Specialist Applications

Geometry
Topology
Georaster
Networks
LRS
Geodetic
Long Transactions
Generalist (Business) Applications

Simple Feature Geometries
Spatial Operators
Geocoding
Routing
Web Mapping
Portal/SOA Integration
Spatial Web Services Delivery

Core Web Services Infrastructure

- Simple Features
- GeoRaster
- Topology
- Networks
- Spatial Data Mining
- Geocoding
- Routing
- 3D

3rd Party Partner Technology

- Policy based resource management
- Workload scaling
- Workload redistribution
- Orchestration & Workflow
- Security provisioning & mgmt.
- Business Logic
- Industry Models
- Visualization
- Interactive Editing
- Industry Specific APIs
- Industry Knowledge
- Packaged Solutions

Web enabled Partner Applications

- GIS
- Fleet & Logistics
- Citizen Portal
- Asset Maintenance
- Criminal Justice
- Health Planning

ORACLE DATABASE 10g
ORACLE APPLICATION SERVER 10g

Wireless & Sensor Web Services
Partners Supporting Oracle Spatial/Locator
Oracle Locator & Spatial
Oracle Locator

- All geometry types
  - Points, lines, polygons
- All indexing methods
  - Rtrees, Quadtrees (fixed or hybrid)
- All spatial queries
  - Inside, touch, overlap, …
- Proximity searches
  - within distance, nearest neighbor
- Distance calculations
- Multiple projections

Base Features

Included in:
- Express Edition
- Standard Edition One
- Standard Edition
- Enterprise Edition
Oracle Database XE

- **Cost**: Free; Includes Locator
- Will store up to 4GB of user data, use up to 1GB of memory, and use one CPU on the host machine.

**User Base:**
- **Developers** working on PHP, Java, .NET, and Open Source
- **DBAs** needing a free, starter database for training and deployment
- **ISVs and hardware vendors** who want a starter database to distribute free of charge
- **OS**: Mandriva Linux 2006 Power Pack+, Novell's SUSE Linux Enterprise Server 9 and SUSE Linux 10, Red Hat Enterprise Linux 4, Fedora and Ubuntu and Windows
Oracle Spatial

Includes Locator features plus:
- Geometry operations
- Spatial aggregates
- Linear referencing
- Coordinate system transformation
- User-defined coordinate systems

Advanced features

An option of Oracle Enterprise Edition

Large data volumes, high user population

Complex queries, Advanced manipulations.
Overview: Oracle Spatial 10g features

- Network Data Model
- Topology Data Model
- GeoRaster
- Geocoder
- Routing Engine
- Spatial Analytic Functions
- Oracle Application Server
- MapViewer
Network Data Model

- **Network Data Model**
  - A data model to store network (graph) structure in the database
  - Explicitly stores and maintains connectivity of the network
  - Attributes at link and node level

- **Supports Network Solutions (Tracing & Routing)**
  - Transportation and Transit Solutions
  - Field Service, Logistics
  - Location-Based Services, Telematics
Topology Data Model

Data model to store *persistent* topology
- Easier to check for data consistency in this model
- Example: when the road moves, the property boundary automatically moves with it

Topology Data Model and Schema
- Describes how different spatial features are related to each other
- A land parcel shares the boundary with a road

10g continues to support transient topology
- Topology computed on demand
- Customers have choice of 2 topology management capabilities
GeoRaster

- A new data type to store raster data
  - Satellite images, remote sensing
- An XML schema to store metadata
  - Data source, layer information
- Georeferencing system
  - Relates image pixels to a longitude/latitude on Earth’s surface

Functionality

- Open, general purpose raster data model
- Storage, indexing, query & analysis of raster data
- No size limit for each raster object
- Publish as JPEG, GIF images
- Compression support (New with 10g Release 2)
  - JPEG baseline (lossy)
  - DEFLATE (lossless)
  - Lizard Tech (Mr.Sid, JPEG 2000)
Geocoder

- Generates latitude/longitude (points) from address
- International addressing standardization
- Formatted and unformatted addresses
- Tolerance parameters support fuzzy matching
- 100% Java, open and scalable
- Record-level and batch processes
- Data provided by leading data vendors
Routing Engine

☒ Enables the hosting of XML-based Web services
  - Given a route request that includes start location and an end location (address information or latitude/longitude), returns route information (which can include directions, driving distances, estimated drive times, and geometry information) between the two locations
  - Given a batch route request consisting of a single start location and multiple end locations, can return information (driving distances and estimated drive times) for each of the start and end location pairs

☒ Supports international routing

☒ Integrated with geocoding engine capability
Oracle Application Server 10g MapViewer Enhancements

- Note: MapViewer is a component of Oracle Application Server

New Features:
- Support for Spatial 10g new features
  - GeoRaster
  - Topology data model
  - Network data model
- Workspace Manager support
- SVG, JPEG, transparent PNG, HTML imagemap support
- Open Geospatial Consortium’s Web Map Service 1.1 interface
- Dynamic coordinate transformations, multiple datasources per map, and temporary styles in a map request
Future Directions
Planned Features

- OGC OpenLS
- OGC Catalogue Service
- OGC WFS
- SOAP & XML interfaces for all web services
- MapViewer: AJAX interface
- Workspace Manager
  - Oracle Label Security for versioned data
  - Additional Valid Time enhancements
Planned 3D Support

Server-side data management

- 3D Coordinate Systems
  - Vertical datums (lat-long, height)

- 3D Types
  - Lines and Points
  - Solids (Cuboids, pyramids)
  - Surfaces (Triangulated surfaces, TINs)
  - Point Clouds and LIDAR

Indexing and operator support

- Extend the R-tree index to support 3-dimensions
- SQL operators for 3D types
- SQL functions for basic 3D analysis
To find out more...

http://www.oracle.com/technology/products/spatial/

Examples, white papers, downloads, discussion forum, sample data, customer successes, partner information, more
Plenary Session: Executive Panel

- David Sonnen (IDC)
- Peter Batty, Vice President & CTO, Intergraph
- Liam McGeown, CEO Acquis
- Manuel Pallage, Managing Director STAR Informatic
- Don Weigel, Director of Industry Solutions, Autodesk
- John Moeller, Senior Engineer, Northrup Grumman