Oracle Spatial Technologies: An Update

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ORACLE

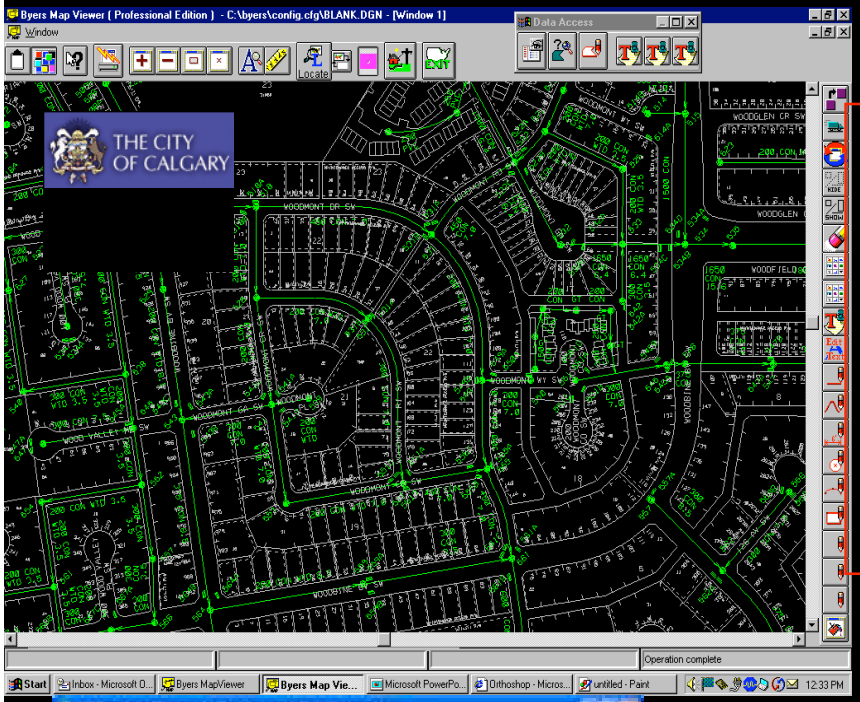
Overview

- Oracle Approach to Market
- Specialist v. Generalist Solutions
- New Developments:
  - Oracle Database XE
  - Oracle Spatial (New & planned features)

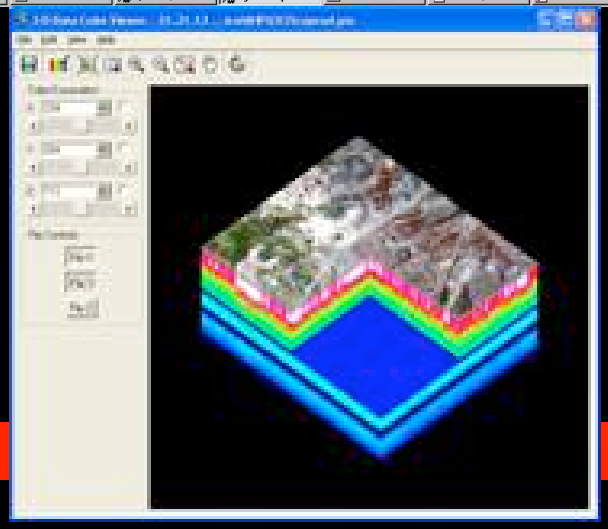
Oracle's Approach to Market:
Provide a powerful spatial data management platform

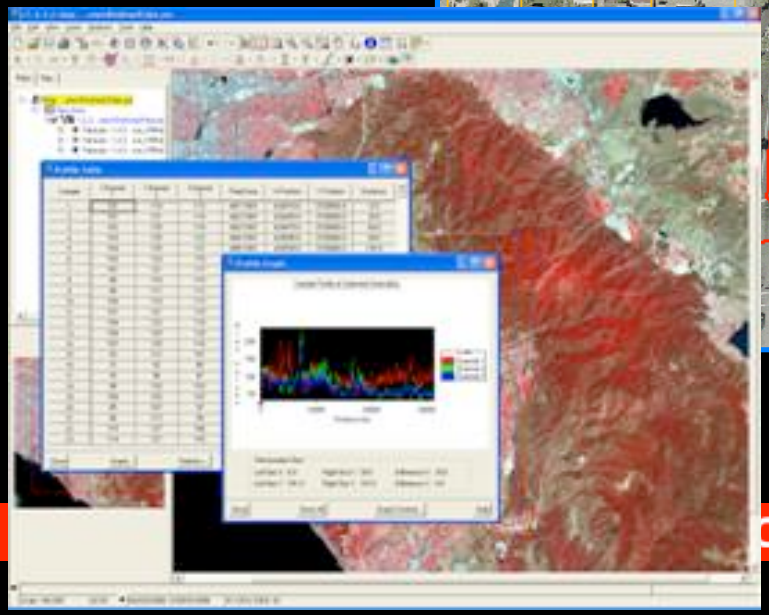
- **GeoSpatial**
  - Government
  - Utilities
  - Energy
- **Enterprise Applications**
  - CRM (Sales, Marketing, Call Centers)
  - ERP (HR, Supply Chain, Asset Management, Financials)
  - Tracking & Logistics (RFID, Sensor Web)
  - MapViewer Introduction

GIS Specialist Applications

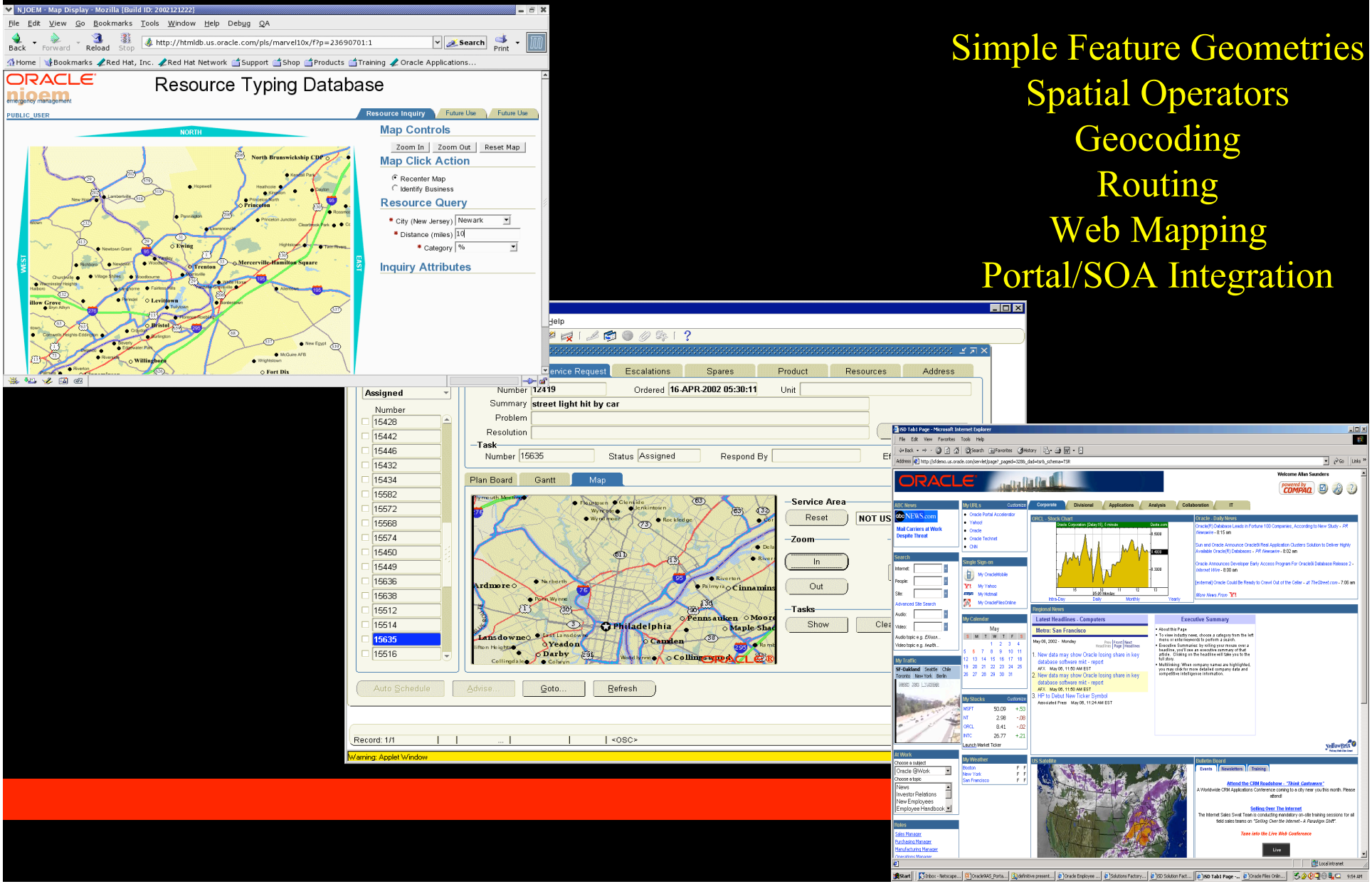


Geometry
Topology
Georaster
Networks
LRS
Geodetic
Long Transactions





Generalist (Business) Applications



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

Spatial Web Services Delivery

Web enabled Partner Applications

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

Core Web Services Infrastructure

ORACLE DATABASE 10g

ORACLE APPLICATION SERVER 10g

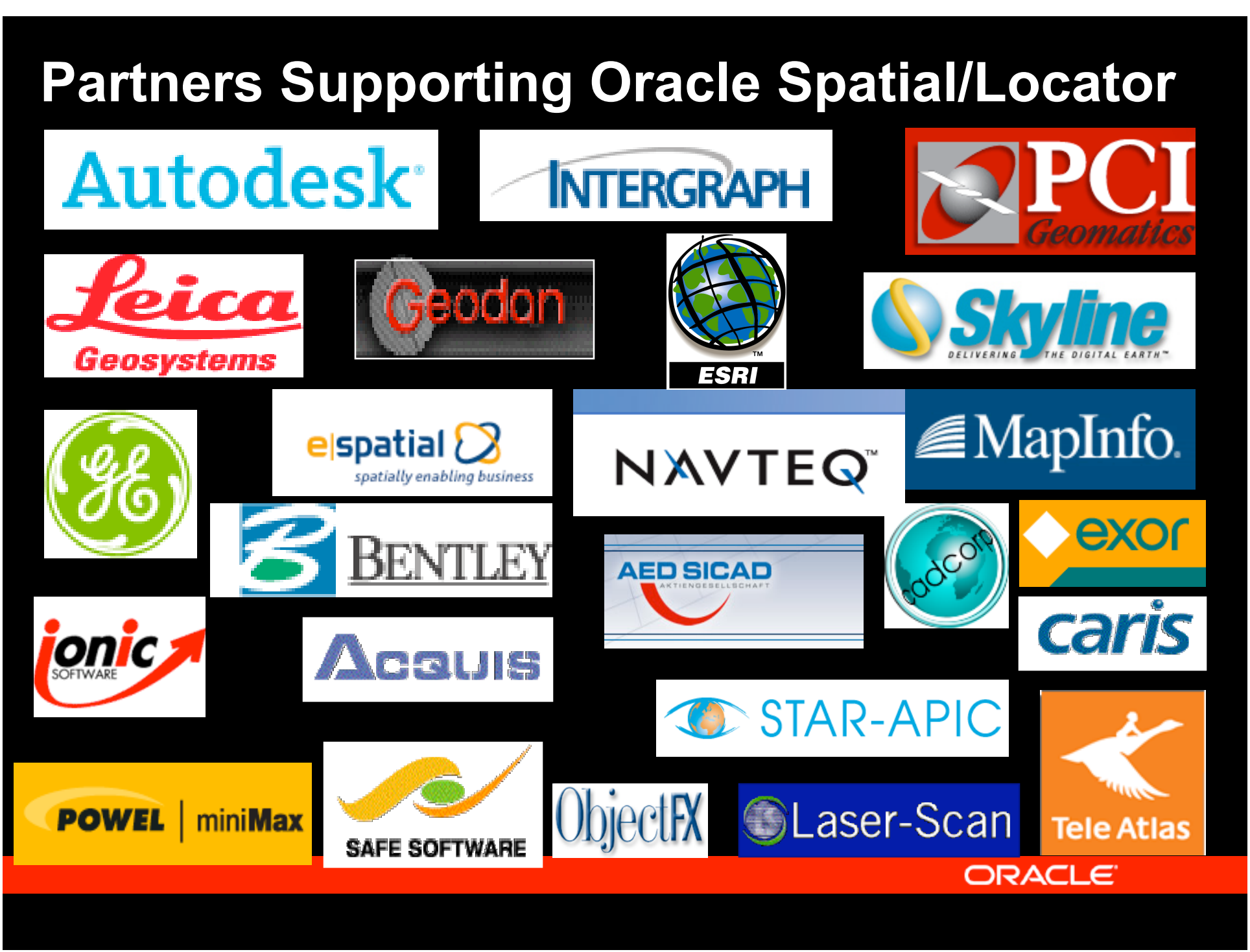
- ☒ Simple Features
- ☒ GeoRaster
- ☒ Topology
- ☒ Networks
- ☒ Spatial Data Mining
- ☒ Geocoding
- ☒ Routing
- ☒ 3D

- ☒ Policy based resource management
- ☒ Workload scaling
- ☒ Workload redistribution
- ☒ Orchestration & Workflow
- ☒ Security provisioning & mgmt.
- ☒ Portal
- ☒ Wireless & Sensor Web Services

3rd Party Partner Technology

- ☒ Business Logic
- ☒ Industry Models
- ☒ Visualization
- ☒ Interactive Editing
- ☒ Industry Specific APIs
- ☒ Industry Knowledge
- ☒ Packaged Solutions

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

- Network Management
- Topology
- Raster integration
- Geocoder
- Spatial Data Mining

Advanced features

An option of Oracle Enterprise Edition

Large data volumes, high user population

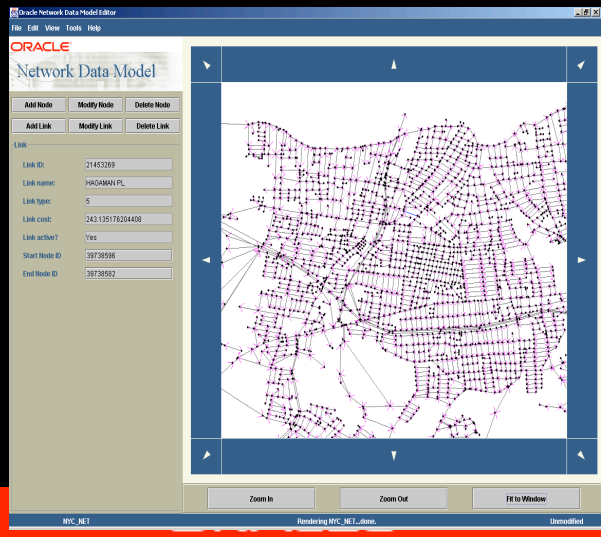
Complex queries, Advanced manipulations.

Overview: Oracle Spatial 10*g* features

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

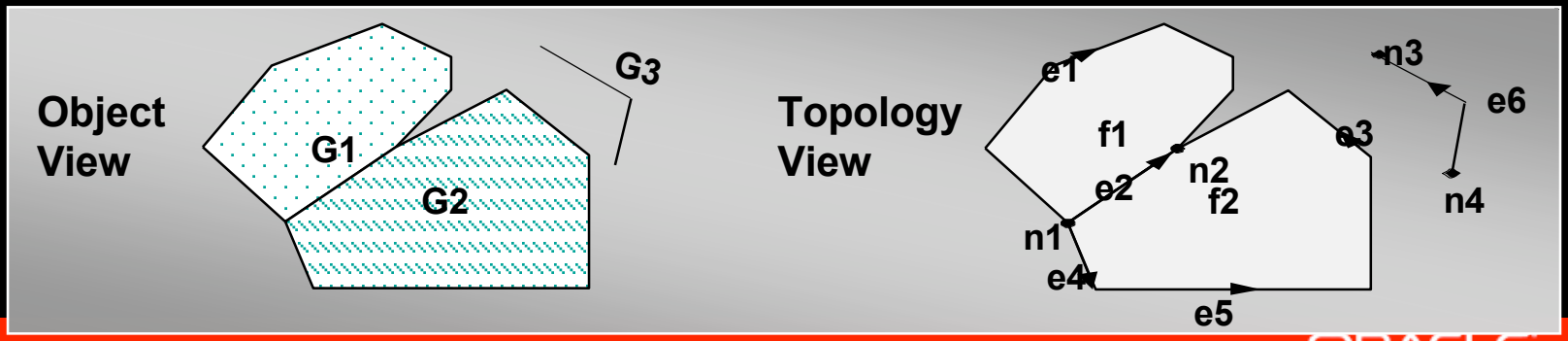
Network Data Model

- 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
- 10*g* 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

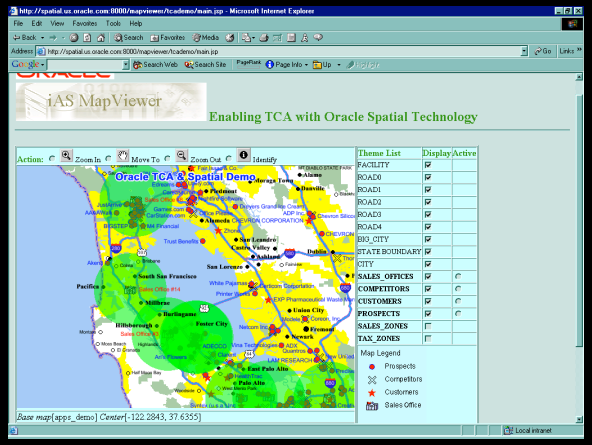
- Generates latitude/longitude (points) from address
- International addressing standardization
- Formatted and unformatted addresses
- Tolerance parameters support fuzzy matching
- 100% Java, open and scalable
- Record-level and batch processes
- Data provided by leading data vendors

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 10*g* 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

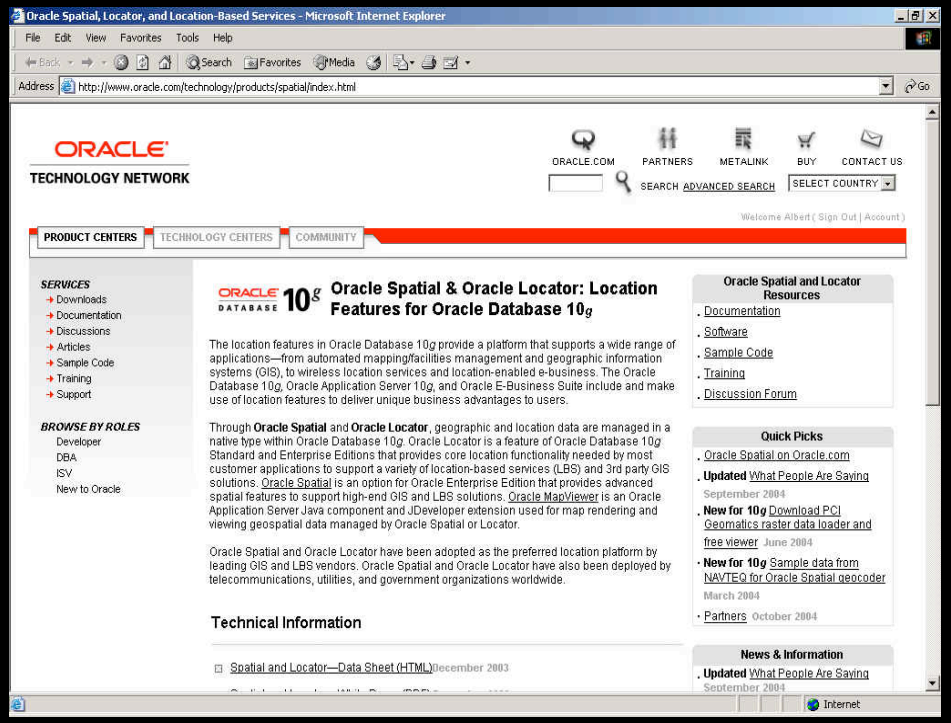
Planned 3D Support

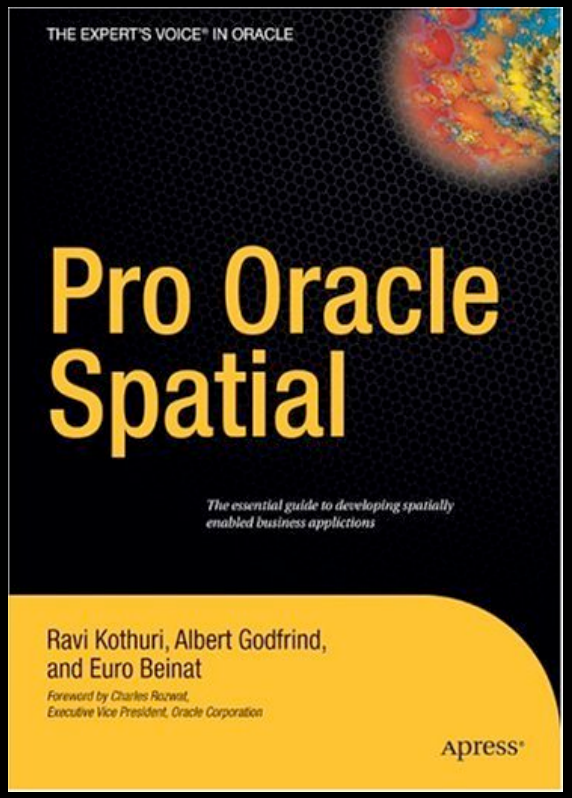
Server-side data management

- ☒ 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