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What's New in Location Analytics

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Director, Product Mgmt

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OPEN
WORLD

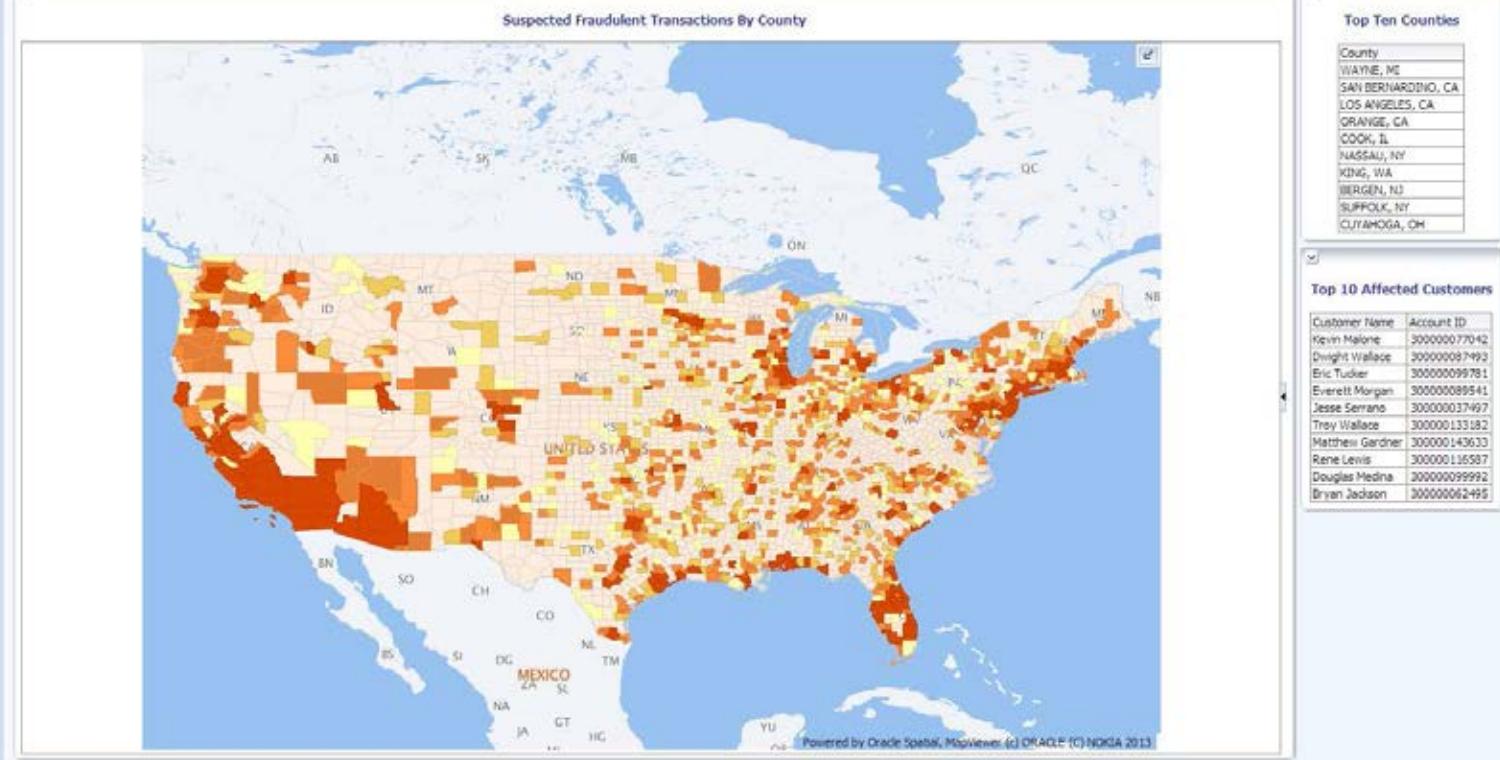
HARDWARE
AND SOFTWARE
ENGINEERED
TO WORK
TOGETHER



The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle Corporation.



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ORACLE Business Intelligence

Search All Advanced Administration Help SampleApp OTH Page Sign Out

Transaction Real Time Result

Custom Link Home Catalog Favorites Dashboards New Open Signed In As Paolo Rodney

Suspected Fraudulent Transactions By County Real Time Analysis: Results for September 23rd

Top Ten Counties

County	State
SAN FRANCISCO, CA	CA
SAN MATEO, CA	CA
FAIRFAX, VA	VA
MARICOPA, AZ	AZ
BROWARD, FL	FL
BALTIMORE, MD	MD
DALLAS, TX	TX
HENNEPIN, MN	MN
ESSEX, NJ	NJ
ST LOUIS, MO	MO

Top 10 Affected Customers

Customer Name	Account ID
Steven Anderson	300000012507
Anthony Wilson	300000037888
Lynn McBride	300000012790
Clifford Nelson	300000050062
Suwart White	300000027776
Adoloh Watson	300000000202
Victor Tucker	300000037523
Tommy Strickland	300000012362
Horace Scott	300000025031
Jeffrey Wagner	300000029024

Powered by Oracle Spatial, MapViewer (C) ORACLE (C) NOKIA 2013

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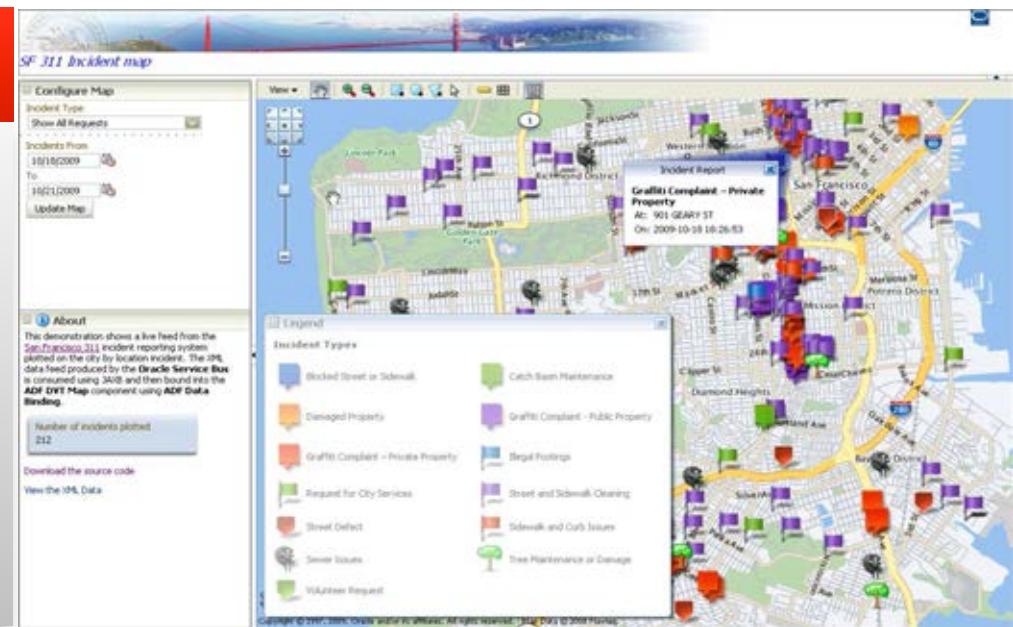
Program Agenda

- MapViewer: new features
- Spatial & Graph 12c: new features
- Demos
- Discussion

Oracle Fusion Middleware MapViewer

J2EE Mapping Component

- A JEE component (.ear) for developing web mapping applications. Usually deployed in WLS.
- Renders geospatial content stored in Oracle databases and other sources.
- Provides JavaScript (HTML5) and REST/XML APIs
- Built-in support of OGC standards
- Easy mash-up with 3rd party map services
- Companion desktop tool (MapBuilder)





Primary Focus Areas

For enhancements

- Rich client interactivity
- Map data editing
- 3rd party data sources
- Separate MVDEMO samples app

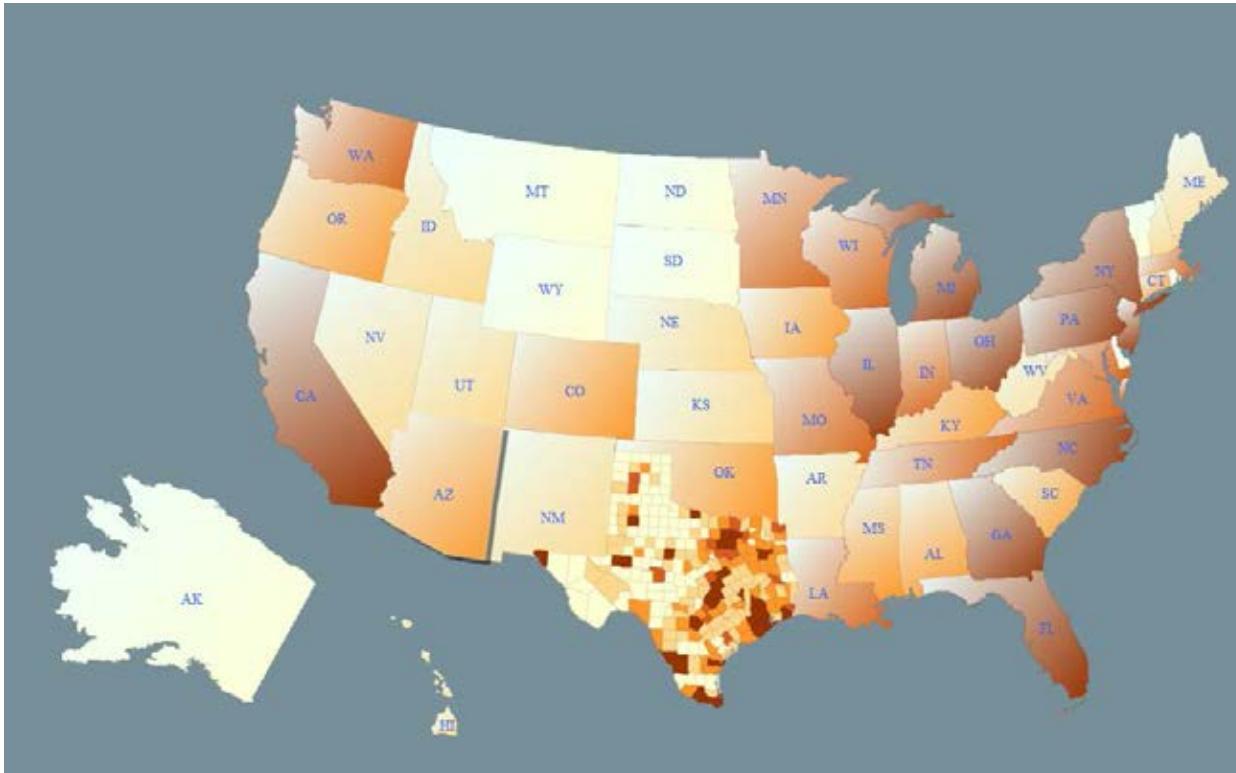


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Rich client interactivity

- HTML5 based Javascript API
- Complete re-write of the Oracle Maps JavaScript API
- Based on HTML5 (canvas & svg) standards
- Much richer client-side rendering & interaction
- Mobile support
- Supports lightweight data editing and region management
- Provides a robust, cleaner and richer mapping client for app developers.

New Javascript (HTML5 Canvas) API



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HTML5 API

Map Template

- Introduced in 11.1.1.7.1
- Set of related geoJSON files + a configuration file
- Config file lists metadata: layers, styles, initial map display et al
- geoJSON files generated by Map Data Server
- MapViewer server not required at run time

HTML5 API

A sample Map Template config file

```
"init": {  
    "center": [-100, 38],  
    "zoomLevel": 4,  
    "layers": ["us_states"],  
    "tileLayer": "Oracle maps"  
},  
"vectorLayers": [  
    {  
        "dn": "us_counties",  
        "uri": "/mvdemo/datapacks/usa_counties.json",  
        "cn": ["US counties", "United States Counties", "Counties of USA"],  
        "pl": ["us_states"],  
        "styles": {  
            "normal": "mutedColor1", "mouseOver": "hoverColor1",  
        }  
    },  
    {  
        "dn": "us_states",  
        "uri": "/mvdemo/datapacks/usa_states.json",  
        "cn": ["USA States", "US states", "States of USA", "States"],  
        "cl": ["us_counties", "us_airports"],  
    }  
],
```

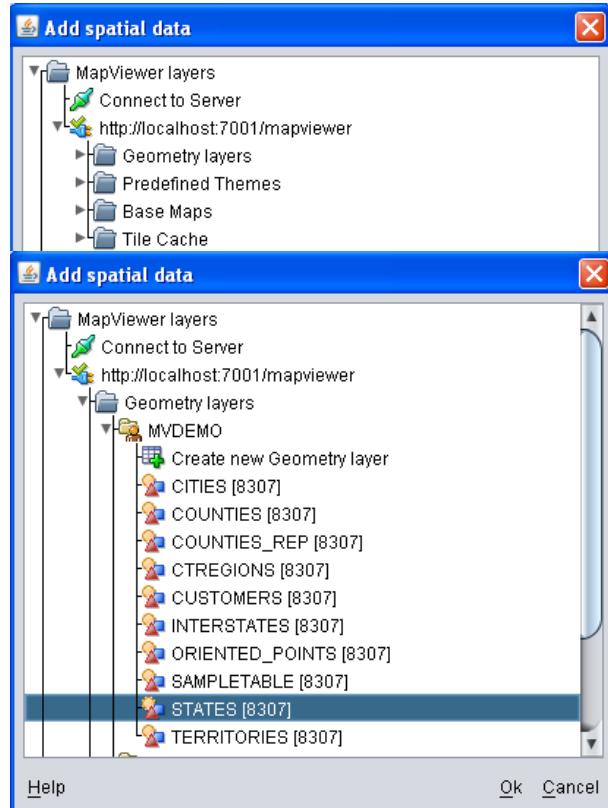
```
"tileLayers": [  
    {  
        "dn": "Oracle maps",  
        "vendor": "oracle"  
    },  
    {  
        "dn": "Nokia maps",  
        "vendor": "nokia",  
        "mapTypes": "normal,terrain,satellite",  
        "key": "<your_nokia_key>",  
    }  
],  
"styles": [  
    {  
        "dn": "mutedColor1",  
        "type": "color",  
        "def": {  
            "fill": "#cccccc",  
            "stroke": "#444444",  
            "fillOpacity": 0.4  
        }  
    },  
],
```

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Map data editing

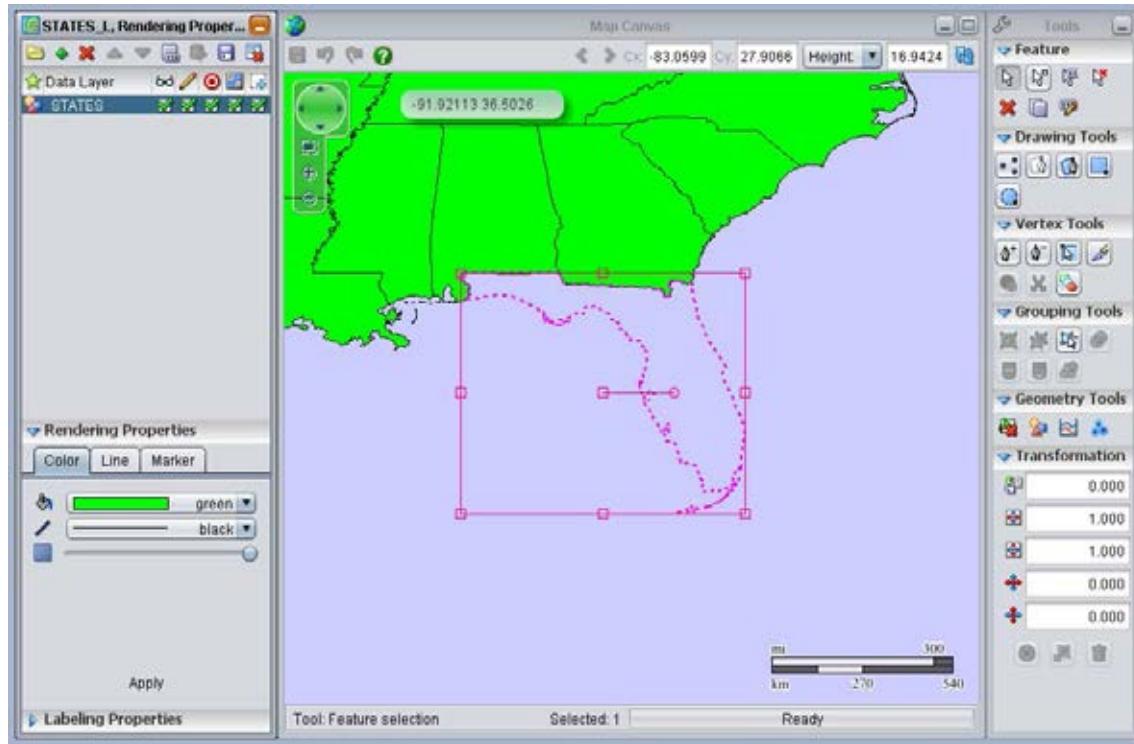
- Web-based editor
- A web-based spatial data editing tool
- Supports versioned, concurrent editing through editing “sessions”.
- Supports geometry model only. Others (topology, ndm editing) planned for future releases.
- Supports WFS-T
- All aspects of an editing session are saved in database
- Admin tool to visually review editing sessions, as well as resolve conflicts and merges sessions.

Editor: Select layer



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Select a feature and edit it



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3rd party data sources

- MapViewer as a mashup component
- MapViewer as a component for consuming and aggregating third party spatial data sources
- Support various standards, such as WMTS (Tile Service), TMS, WFS, WMS, GeoJSON, and GeoRSS.
- Bundles GDAL /OGR for support of even more external data sources

Additional 3rd party map tile layer support

ORACLE® MapViewer® Administration Console 11g

Admin | Editor | Logout | Help

Home Management Meta data About

Manage MapViewer

- Configuration
- Datasources
- Geometry Cache
- Create Tile Layer
- **Manage Tile Layers**
- Monitoring

Area Selection Tool
Draw a rectangular selection area on the map

Off

Zoom Level Selection
Select one or more levels to perform tile operation

Level 0
Level 1
Level 2
Level 3
Level 4
Level 5
Level 6
Level 7
Level 8
Level 9

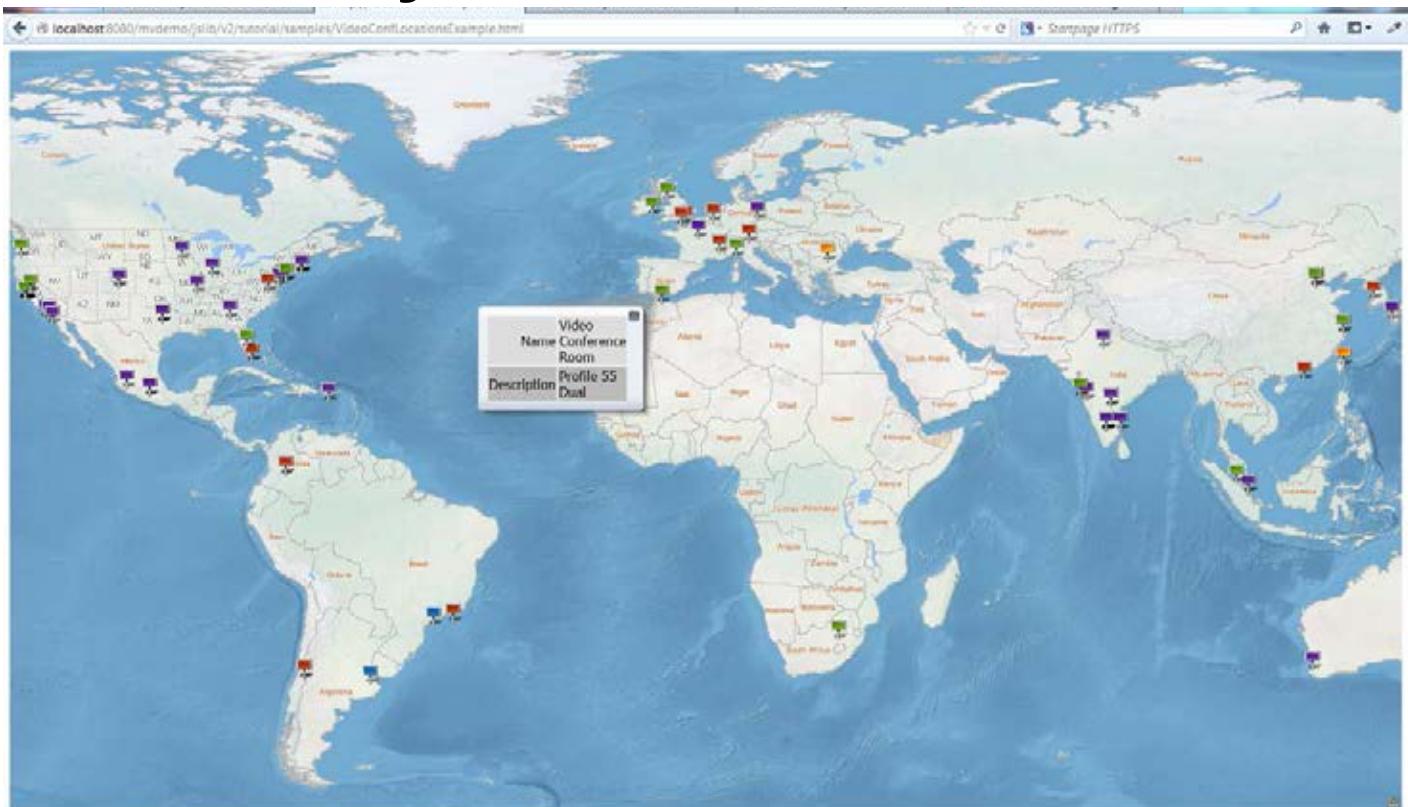


[Return](#)

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GeoJSON layer

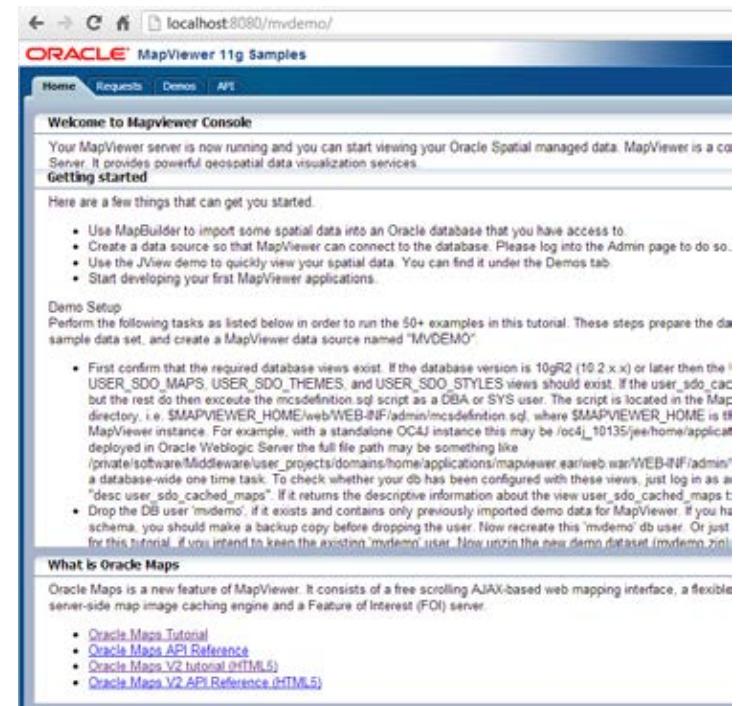


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The MVDEMO samples app

Overview

- A separately deployed JEE app
- Requires MapViewer in the same domain
- Requires the new MVDEMO sample data set
- Content: JS & Java API docs, Demos, Tutorials, Sample REST/XML requests

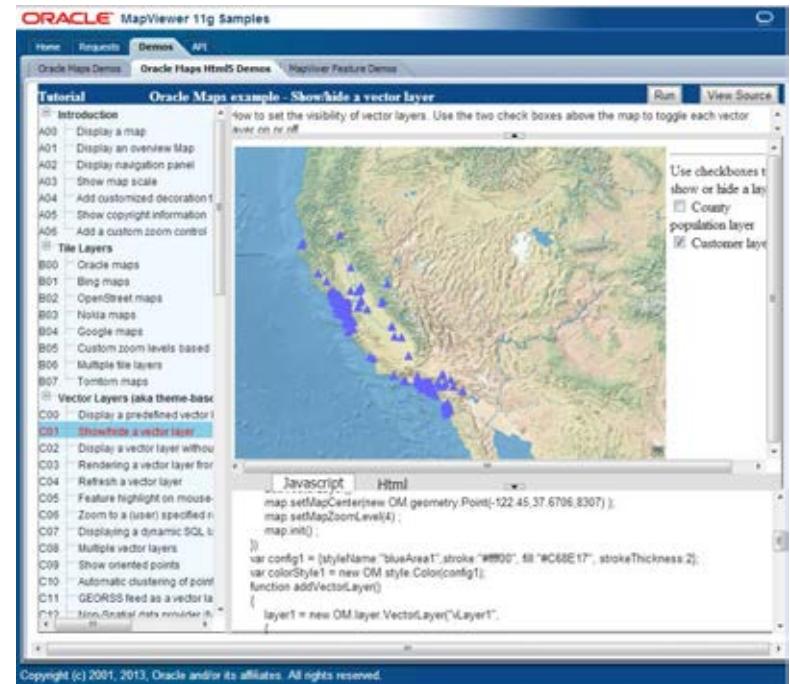


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The MVDEMO samples app

The new HTML5 tutorials

- A rich set of V2 API tutorials
- Modify and run tutorial code on the fly, fiddler-style
- Great for learning the new API



Advances with Oracle Database 12c

- New Spatial Features

Dramatic
Performance

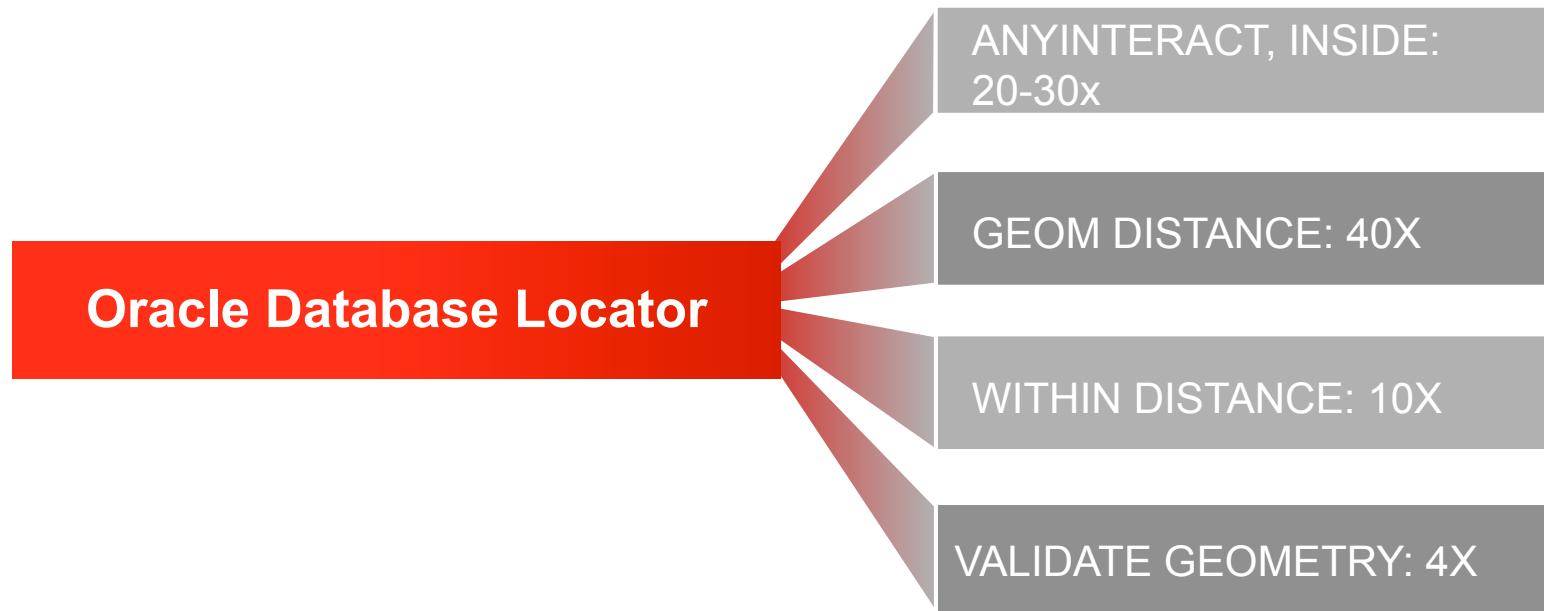
Simplified
Application
Development



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Core Spatial Functions and Operations

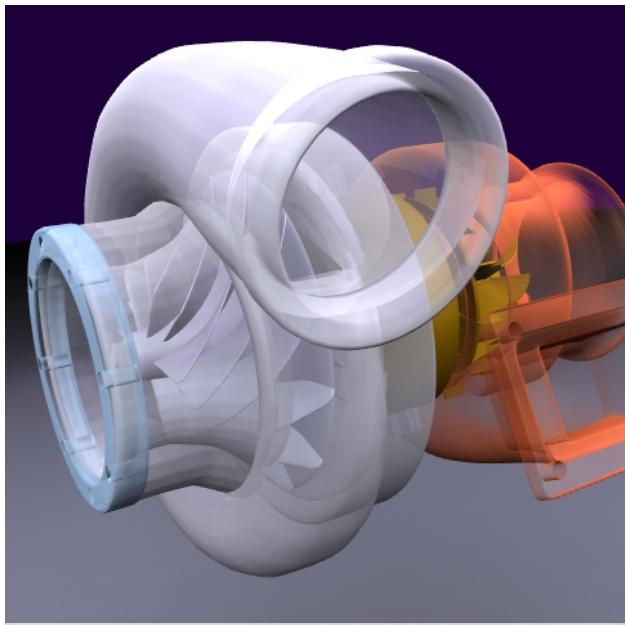
Performance



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Vector Performance Acceleration

Oracle Spatial and Graph “Turbo-charger” feature



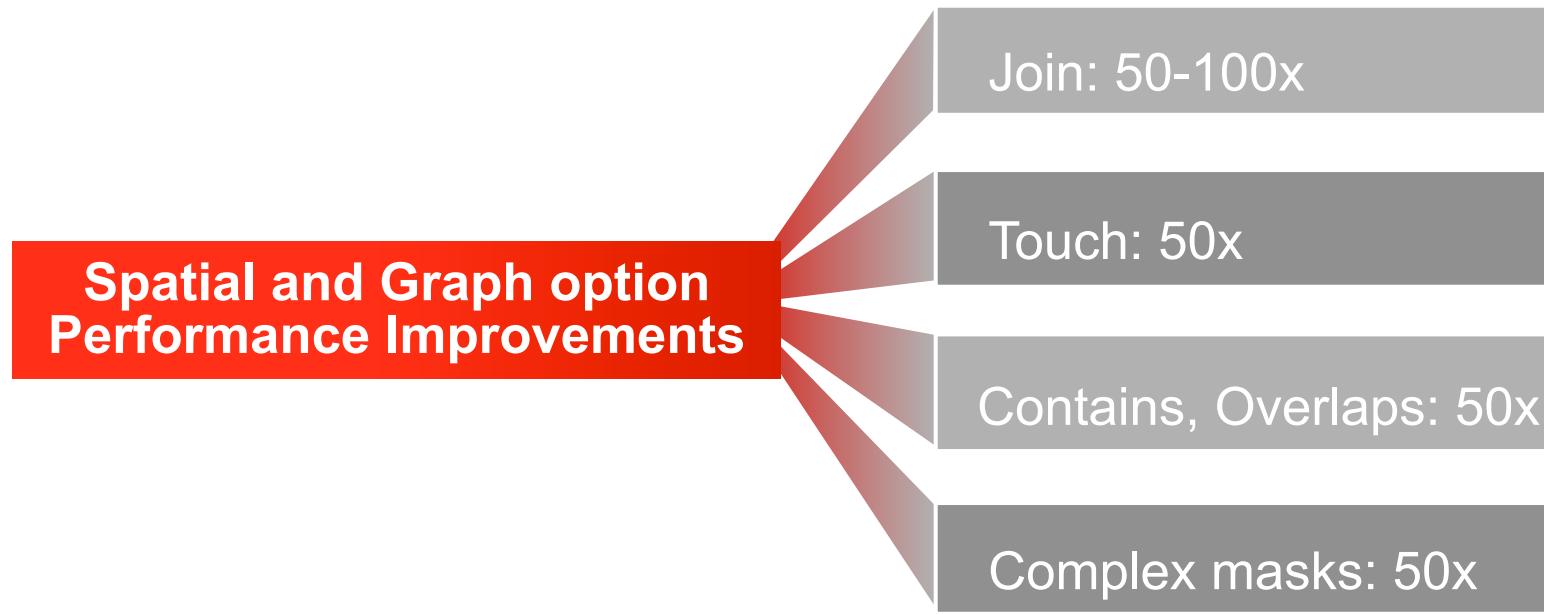
OPTIMIZED METADATA QUERIES

- Kernel level caching
- Performance gains for DMLs and Spatial function calls
- Optimization especially noticeable in workflows with many fast running queries

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Vector Performance Acceleration

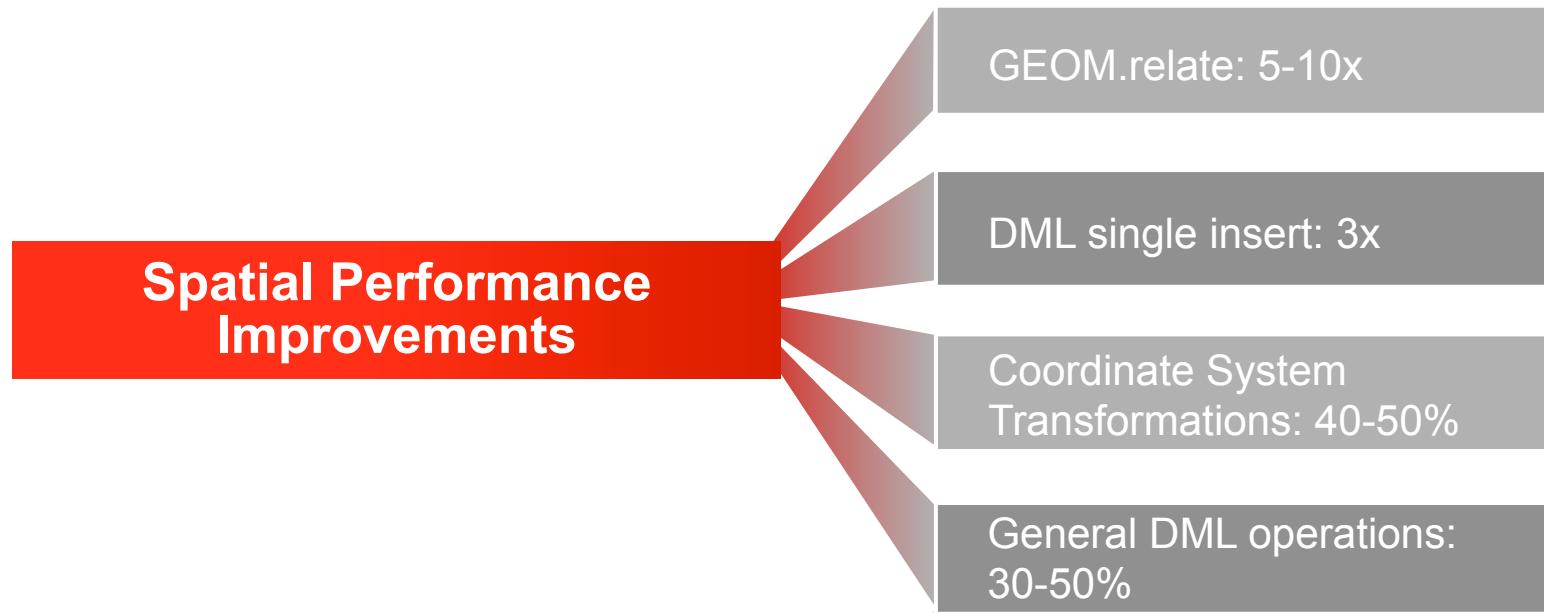
“Turbo-charger” feature for spatial functions and operators



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Vector Performance Acceleration

“Turbo-charger” feature for spatial functions and operations



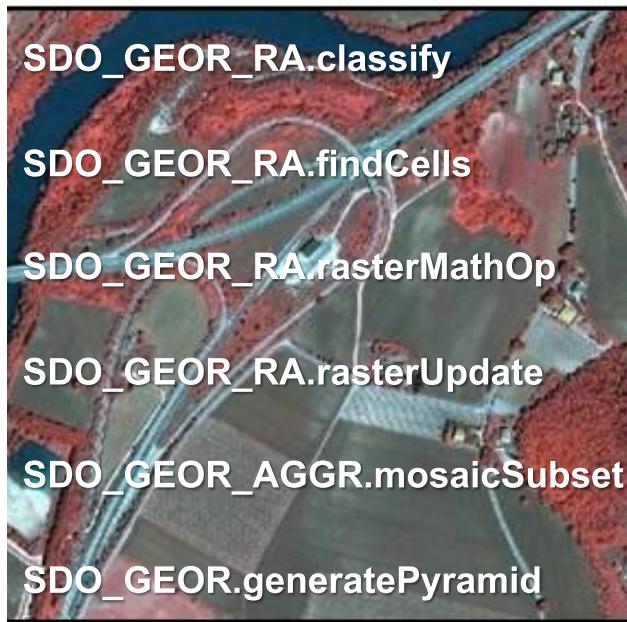
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New PointInPolygon Function

Fast Point in Polygon without Spatial index

- SDO_PointInPolygon Function
 - Arg1: cursor that select a set of points
 - Very flexible as the data can come from a table, or result of another query
 - E.g., select * from point_data where c1 < 10 and c2 > 100 ...
 - Arg2: is any Polygon geometry
 - Returns all the points that are inside the polygon
- Useful when large number of points have to be classified based on a set of polygons
- Parallel enabled
- Can easily process 30K points per second in serial case

Parallel Raster Operations



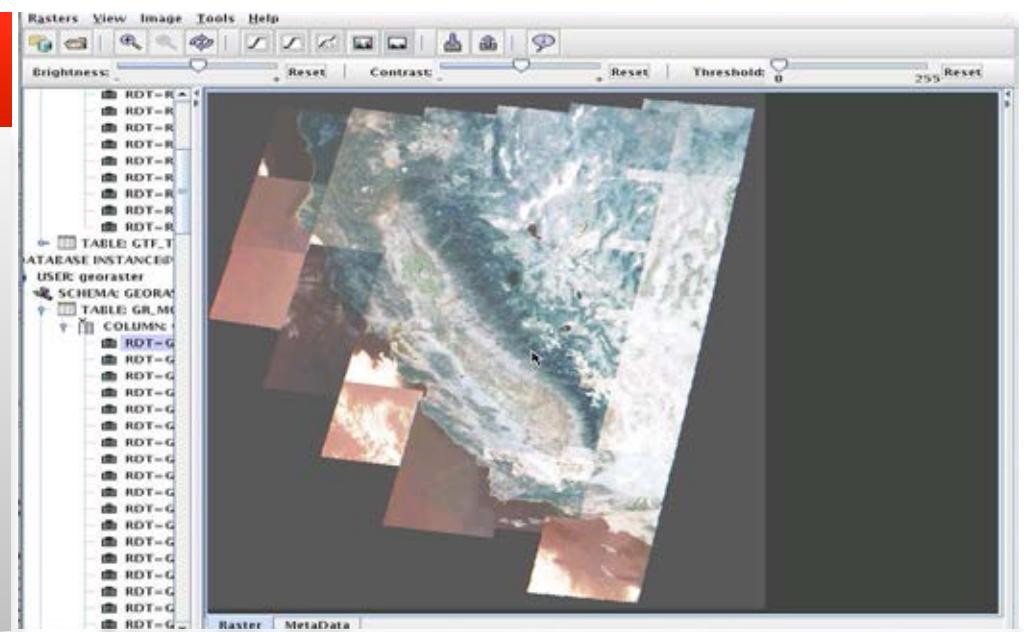
- MANY RASTER FUNCTIONS CAN PARALLELIZE
- SERIAL OPERATIONS PERFORM UP TO 3X FASTER
- SCALES TO OVER 100X FASTER ON HIGHLY PARALLEL SYSTEMS

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Virtual Mosaic and Image Processing

In Database Processing

- Virtual Mosaic of collections of any georeferenced GeoRaster objects
- Advanced spatial queries and on-the-fly transformation and mosaics
- Raster Algebra operations to create new map products
- Image Processing: Masking, stretching, segmentation, rectification

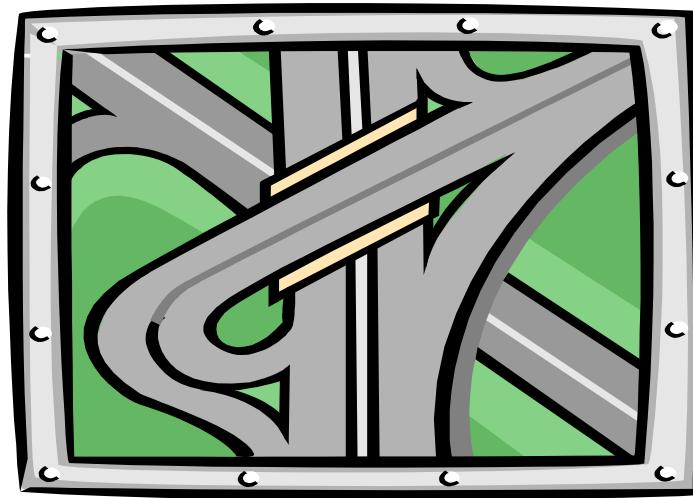


Mosaic of Landsat Images

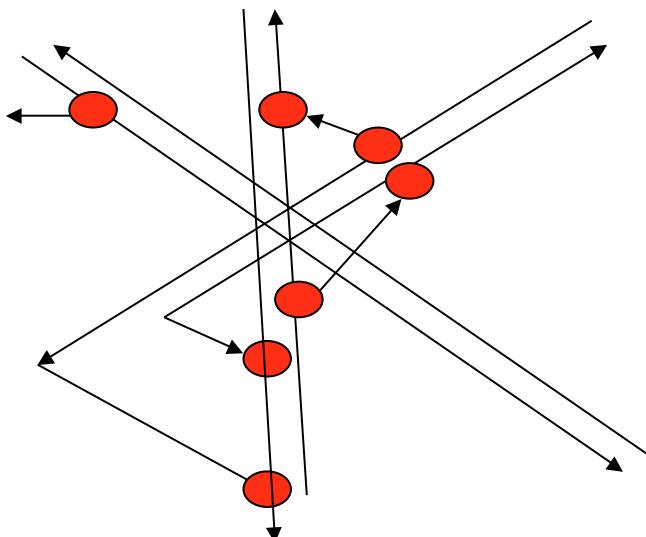
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Real World Feature Modeling in NDM Graph

Feature Representation



Network Representation



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Network Data Model Graph

Temporal Modeling/Analysis

- Traffic Patterns
 - Record historical travel
 - Based on time of day and day of the week
- NDM can use traffic patterns to compute shortest paths
- Support NAVTEQ Traffic Patterns format out of the box

Shortest Path Analysis
Left click for start point, right click for end point, or manually enter route ID, link ID@geocode, or address.

Start: 19940037
End: 199919135

Network Constraints
(Hold ctrl key for multi-select or de-select)
custom.NoHighwayConstraint
custom.ProhibitedZoneConstraint
oracle.spatial.router.ndm.TruckHeightConstraint
oracle.spatial.router.ndm.TruckLegalConstraint

Prohibited Zone

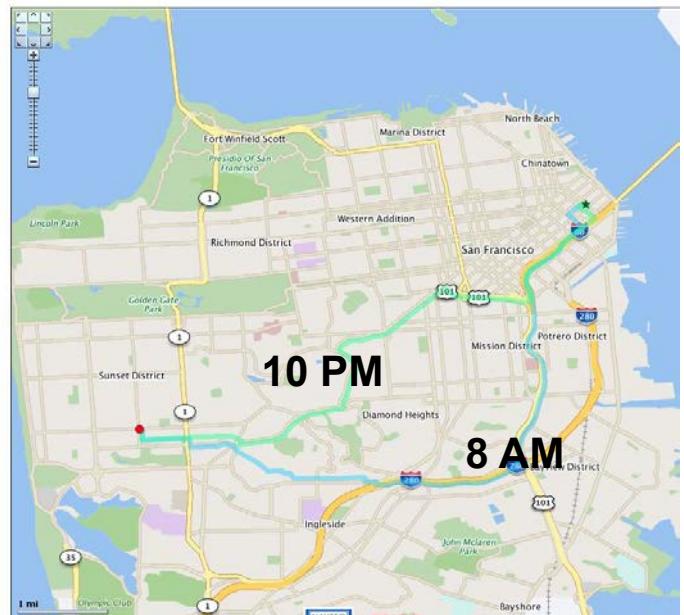
Link Cost Calculators
custom.TrafficLinkCostCalculator

Keep Previous Results
Reverse Direction

Include Traffic data
Start Time: 10:00 PM

Analysis Result:
(19940037->199919135)
[cost:946.05914, 105 links]
Time to analyze the network: 0.467s.
Time to compute geometries: 0.035s.

Analysis Result:
(19940037->199919135)
[cost:872.83101, 172 links]
Time to analyze the network: 0.438s.
Time to compute geometries: 0.039s.



Network Data Model Graph

Multi-Modal Routing

- Each mode (car, bus, rail, bike, etc) modeled as a separate network
- Single logical network represents all modes of transportation
- Transition nodes where networks meet
- NDM APIs can specify the modes
- Out of the box support for transit data published by transit authorities

```
Analysis Result:
From: 575485095
To: 575485155

Drive/Walk to
CONNECTICUT AV and WYOMING AV
(0.1 meters)

[1]
Board Route 227 (Outbound)
At 19TH CONNECTICUT AV and WYOMING AV
Dep. Time : 18:18:42

Get down at 19TH CONNECTICUT AV and NW 20TH ST

[2]
Transfer to Route 96
Board Route 96 (Outbound)
At 19TH CONNECTICUT AV and NW 20TH ST
Dep. Time : 18:21:00

Get down at NW H ST and NW JACKSON PL

[3]
Transfer to Route 75
Board Route 75 (Outbound)
At NW H ST and NW JACKSON PL
Dep. Time : 18:32:42

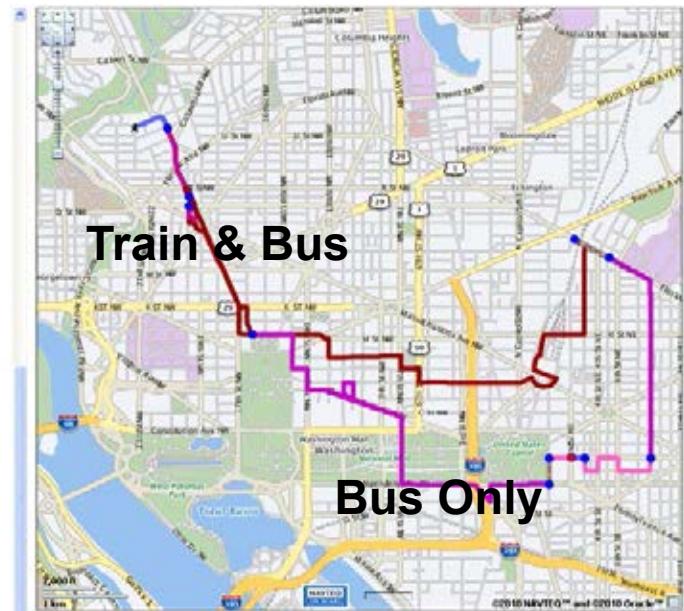
Get down at SE INDEPENDENCE AV and SE 1ST ST

[4]
Transfer to Route 151
Board Route 151 (Outbound)
At S CAPITOL ST and SE 1ST ST
Dep. Time : 18:51:56

Get down at S CAPITOL ST and SE 3RD ST

Drive/Walk from
S CAPITOL ST and SE 3RD ST
(0 meters) to destination.

Trip Total Time: 51 minutes.
Number of Bus Routes=4
Number of Train Routes=9
Time to analyze the network: 0.956s.
```



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Network Data Model Graph

Large Scale Drive Time/Distance Analysis

Big Data Analysis

- Millions of customers, find closest store within a specified drive time
- Single database query to find closest store and drive time/distance for each customer
- Customers geocode as based on graph segment
- Network Buffer generates all possible paths



Performance and In-Database Analysis

RDF Semantic Graph

Reasoning

Faster, more efficient, and secure reasoning engine

SPARQL 1.1

Richer query language with improved path analysis. Less application code.

GeoSPARQL

Query language for spatial “linked data.” Less application code.

**Named
Graphs**

Standard Mechanism to distinguish graphs models in large graphs.

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Summary of New Spatial & Graph Features

- Vector Performance Acceleration
- High-performance point-in-polygon processing
- Parallel GeoRaster and Enhanced Raster Operations
- NDM: Feature modeling, multi-modal, temporal
- RDF: views, enhanced reasoning & security, performance

Oracle Exadata

Extreme Scalability for Millions of Spatial Objects

- Millions of spatial objects evaluated in minutes
 - Point in polygon analysis
 - Polygon to polygon analysis
 - Deviation from route
 - Distance covered
- Millions of Spatial objects ingested in minutes
 - Weather readings
 - Traffic readings
 - Sensor readings



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Oracle Exadata

High Performance RDF Graph Workloads

- RDF Semantic Graph is designed for the Exadata architecture
- 3x faster inferencing and querying
- Parallel load, inference and query
- Inferencing accelerated with Hybrid Columnar Compression
- Queries faster with OLTP index compression on B-tree indexes



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Oracle Spatial and Graph

Proven, industry-leading technology

Dramatically improved performance

Simpler, more scalable applications

Engineered for Exadata

HTML5 support in MapViewer



Resources

■ Oracle Technology Network

Get software downloads, sample code, tech info, updates, documentation, partner resources

- Oracle Spatial and Graph

www.oracle.com/technetwork/database-options/spatialandgraph/overview/spatialfeatures-1902020.html

- Oracle Fusion Middleware MapViewer

www.oracle.com/technetwork/middleware/mapviewer/



User Groups & Certification

- **Oracle Spatial & Graph Special Interest Group:**
Connect and exchange knowledge with the user community

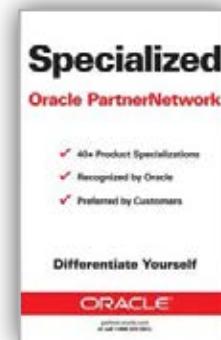
**– *Meet the SIG Board at OOW: Wed 9/25, 2:00-3:00pm
OTN Lounge, Moscone South Lobby***

- Join our groups: LinkedIn, Google+, IOUG SIG
- Visit [OTN Spatial – Community](#)
Search online for “Oracle Spatial and Graph Community”
- Email oraclespatialsig@gmail.com



- **Individual Certification, Partner Specialization**

- [www.oracle.com/technetwork/database-options/spatialandgraph/learnmore/spatial-partners-423197.html](http://www.oracle.com/technetwork/database/options/spatialandgraph/learnmore/spatial-partners-423197.html)
- Talk to Oracle team this week at OPN Lounge or Oracle Spatial & Graph demopod in Moscone South



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Spatial and Graph at OOW 2013 - Sessions

Date/Time	Title	Location
Monday, Sept 23		
1:45 PM - 2:45 PM	Best Development Practices with Maps, Spatial, and Graph Analytics	Marriott Marquis - Golden Gate C2
3:15 PM - 4:15 PM	Latest Spatial Features in Oracle Database 12c	Moscone South - 303
4:45 PM - 5:45 PM	Fast Data with Oracle Event Processing	Moscone North - 130
4:45 PM - 5:45 PM	Newest Graph Features in Oracle Database 12c	Moscone South - 303
7:15 PM - 8:00 PM	What's New in Location Analytics: HTML5, Mobile, and Spatial in Oracle Database 12c [Birds of a Feather]	Marriott Marquis - Foothill G
Tuesday, Sept 24		
12:00 PM - 1:00 PM	Enhancing City Public Transportation	St. Francis - Elizabethan C/D
Wednesday, Sept 25		
11:45 AM -12:45 PM	Customer Experiences with Oracle Spatial and Graph	Moscone South - 300

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Spatial and Graph at OOW 2013 – Demos

Date/Time	Title	Location
Monday - Wednesday	Oracle's Spatial Technologies	Moscone South Exhibition Hall Oracle Database DEMOgrounds (Left - SL-070)
Monday - Wednesday	Graph Database for the Enterprise	Moscone South Exhibition Hall Oracle Database DEMOgrounds (Left - SL-069)
Mon, 12:00-12:20pm Wed, 10:30-10:50am	Location-Based Services (Big Data Theater)	Moscone South Exhibition Hall Room 106 - Industry Showcase Theater

Partners

Date/Time	Title	Location
Monday - Wednesday	HERE, a Nokia Business	Moscone South Exhibition Hall Booth #2232
Monday - Wednesday	Esri	Moscone South Exhibition Hall Booth #640

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Spatial and Graph at OOW 2013 – Hands On Lab

Date/Time	Title	Location
Tuesday, Sept 24		
10:30 AM - 11:30 AM	Fast Data Best Practices and Design Patterns with Oracle Event Processing	Marriott Marquis - Salon 12/13

Meet-Ups

Date/Time	Title	Location
Wednesday, Sept 25		
2:00 PM - 3:00 PM	Oracle Spatial and Graph Special Interest Group Meet-Up	OTN Lounge - Moscone South Lobby
2:00 PM - 3:00 PM	RDF Graph User Meet-Up with Oracle Product Team	OTN Lounge - Moscone South Lobby

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