DOJ Office of Justice Programs
OBIEE Geospatial

OVERVIEW

- Awards grants to criminal and juvenile justice field
- Incorporates grant and financial systems
- Supports BJA, BJS, NIJ, OJJDP, OVC, SMART, and other programs

CHALLENGES / OPPORTUNITIES

- Need for 20% performance improvement on spatial queries, scalability, security for mission critical data
- Resolve state when county indicates one state and congressional district indicates a different state
- Plot grantees 2 min, zoom 5 min
- Need to integrate disparate data sets
- Data integrity, accuracy issues

SOLUTIONS

- Oracle Database 12c Enterprise Edition (pending)
  - Spatial Option with GeoRaster, Network Data Model
- Oracle Fusion Middleware 11.1.1.7
  - MapViewer
- Oracle Business Intelligence Enterprise Edition
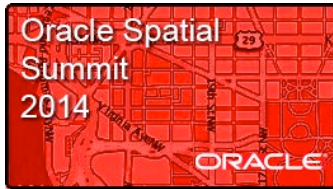- HERE (formerly Navteq) mapping data

RESULTS

- Geocoded 2,700,000 addresses from multiple sources
- Improved the user experience with buttons and breadcrumbs
- Organization now better understands activities in context of location
- Nationwide geocoding of site locations using both address ranges and point locations
- Improved precision thereby making system more useful to the public and business

May 2014
Oracle Spatial Summit

May 21, 2014
Walter E. Washington Convention Center
Washington, DC USA

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Grants Analysis using Oracle BI Suite and Oracle Spatial

Vision

- Display interactive maps including detailed analysis of Grant facts with dynamic user-defined areas enabling better evaluation of Grant related data over a specific territory using statistical data from institutional sources.

- Incorporate location data in new and existing data marts.

- Integrate Geospatial components as a solution to support analysis across multiple OJP Bureaus Offices and to improve the Grant/ Policy decision-making process.

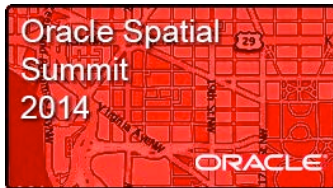- Implement of a Geospatial infrastructure that multiple applications share.

OJP Spatial Use Cases

- Compare areas receiving Grant funding.
- Grantees reporting and submission deadlines.
- Natural disaster such as Hurricane Sandy.
- Identify grantees in a given travel area.

OJP Spatial Use Cases

React to natural disaster, Hurricane Sandy

* Indicates required field. Select the desired values for the prompt below and click "Apply".
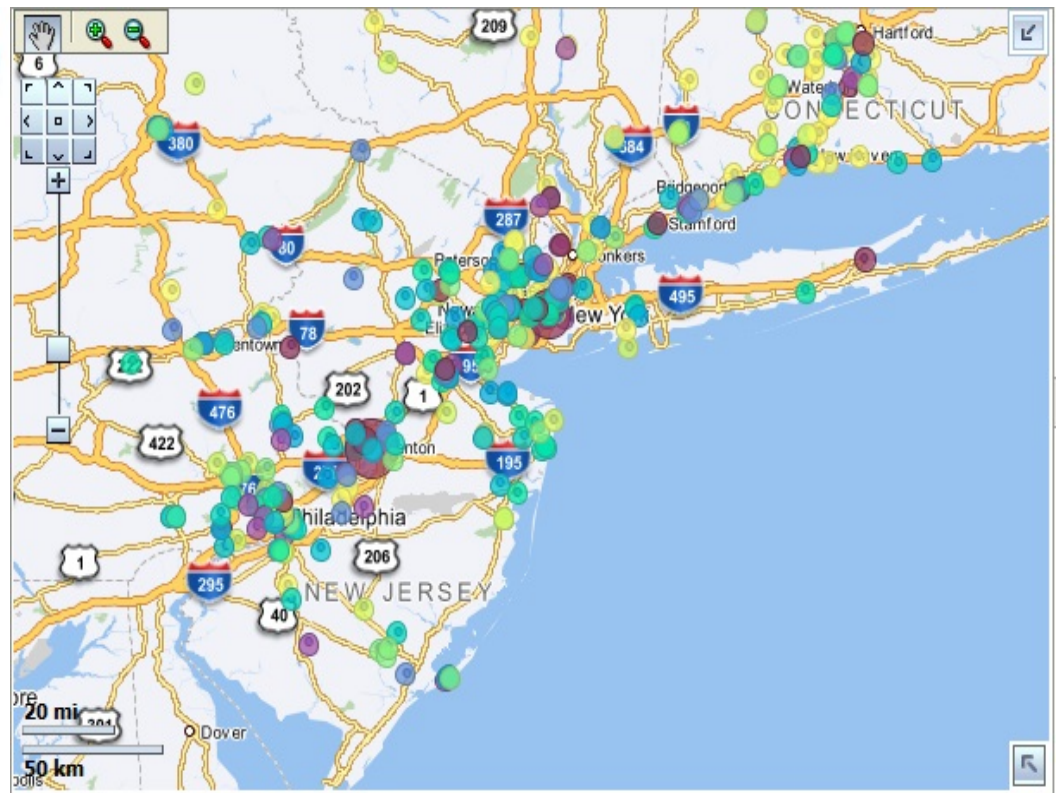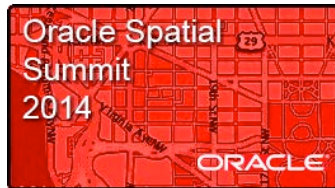
* Distance (miles) 100

* Address 17 Battery Place

* City New York

* State NY

* Zip Code 10004

Apply Reset ∨

OJP Spatial Use Cases
Compare areas

- Which tribal areas with high crime rates are applying for Grants and what funds are they receiving?

- How do tribal areas compare according to arrest rates and funding?

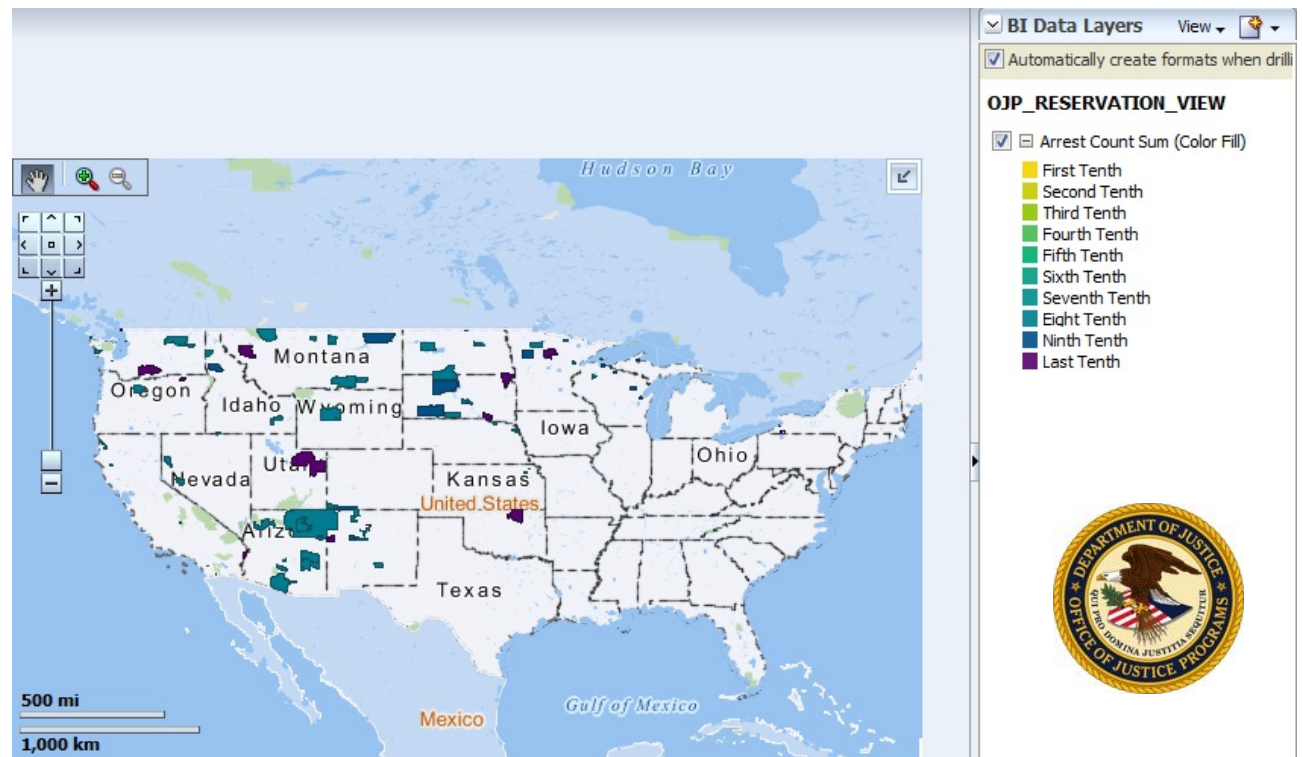| American Indian Desc	American Indian GEO ID	Arrest Count Sum	Obligate Family Amt Sum
Agua Caliente Indian Reservation	35399734	86,733	$317,136.91
Osage Indian Reservation	34688107	59,062	$8,388,160.73
Yakama Indian Reservation	26508892	41,207	$16,648,578.12
Uintah and Ouray Indian Reservation	1416818761	22,863	$2,407,675.23
Umatilla Indian Reservation	26497376	21,609	$6,426,510.99
Leech Lake Indian Reservation	30957467	17,972	$15,093,562.46
Zuni Indian Reservation	35067475	14,820	$17,943,387.29
Allegany Indian Reservation	35488080	12,759	$712,630.00
Colorado River Indian Reservation	35069547	12,237	$9,464,084.03
Yankton Reservation	1414581967	9,667	$12,654,846.36
Lummi Indian Reservation	26491221	8,650	$10,723,824.27
Santa Clara Indian Reservation	35071601	5,168	$17,204,008.35
Flathead Indian Reservation	34937675	4,733	$13,475,415.23
Sisseton and Wahpeton Indian Res	30969926	4,556	$6,237,540.82
Lanse Indian Reservation	30956457	4,402	$4,696,739.00
Oneida Indian Reservation	32203858	4,171	$7,979,174.01
Lac du Flambeau Indian Reservation	30961219	3,536	$5,947,859.03
White Earth Indian Reservation	30963601	3,395	$14,069,527.48
Swinomish Indian Reservation	26496713	3,065	$1,470,851.89
Bad River Indian Reservation	30963557	2,977	$1,731,765.45
Fort Peck Indian Reservation	34936747	2,974	$22,485,903.40
Nez Perce Indian Reservation	34944791	2,551	$6,045,002.12
Laguna Indian Reservation	35067635	2,434	$657,648.00
Pine Ridge Indian Reservation	30970850	2,209	$11,015,041.76
Southern Ute Indian Reservation	34874615	1,756	$4,494,003.50

Rows 1 - 25

OJP Spatial Use Cases
Compare areas: Arrests

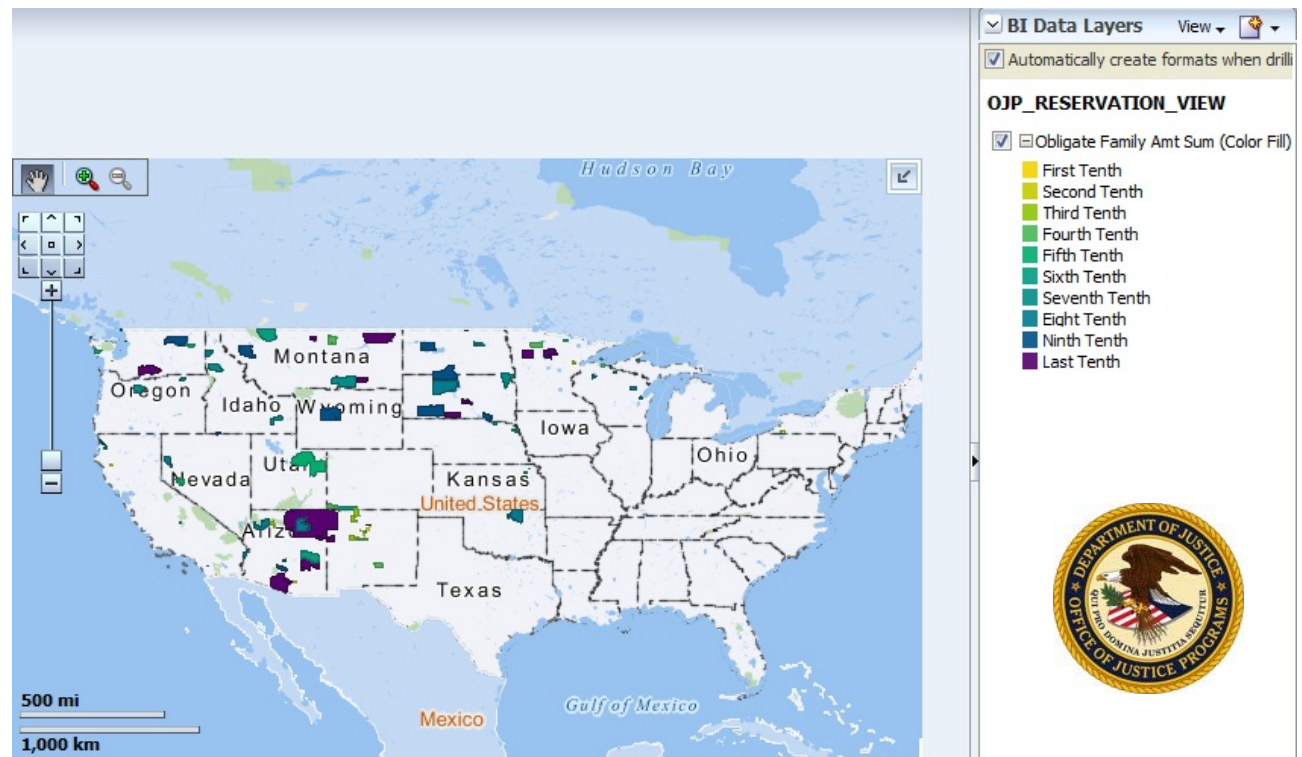- How do tribal areas compare according to arrest rates?

OJP Spatial Use Cases
Compare areas: Funding

- How do tribal areas compare according to Grant funding?

Spatial Reports

Compare state areas by grant awards

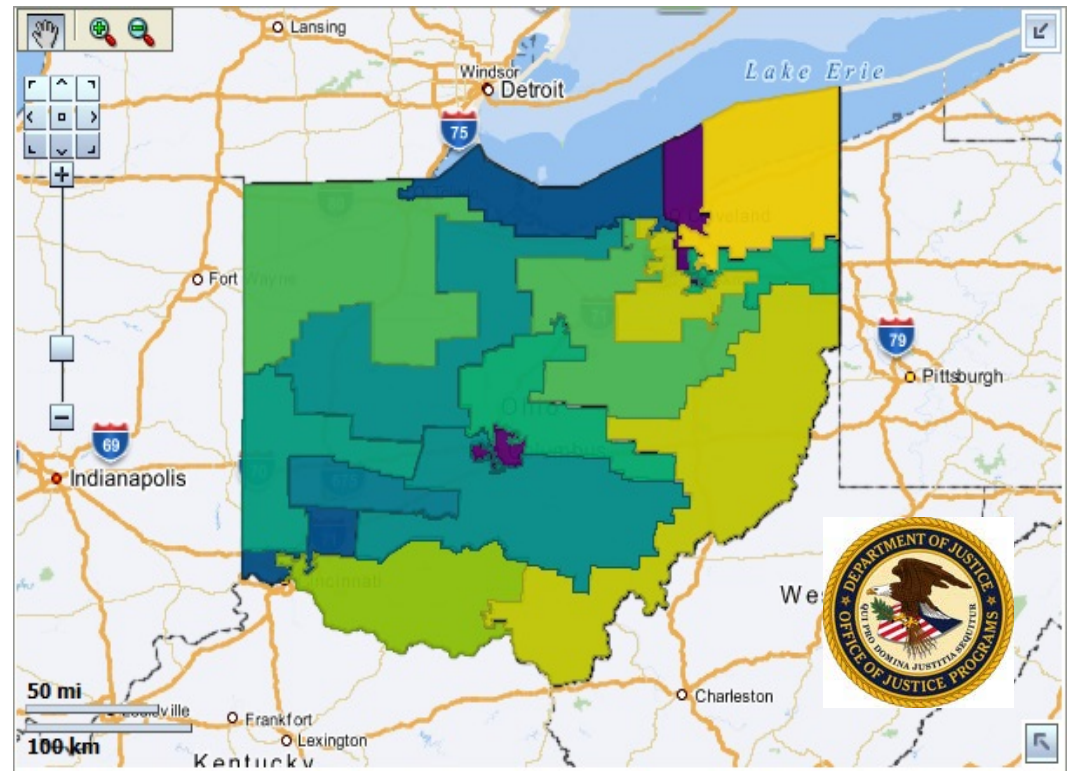- ## Compare areas
  - State
  - County
  - Congressional District

Spatial Reports

Compare district areas by grant awards
(113th Congressional District)

- ## Compare areas
  - State
  - County
  - Congressional District

Why OBIEE?

- High availability through a web platform

- Analytic reporting and increased user interactivity

- Bottom up approach, from data marts to data warehouse

- Graphical reporting (charts, pivots, gauges)

- Scheduled report generation

- Ad hoc analysis

- Global support and development capability

Why OBIEE?

- Intranet deployment
- Scalable
- Deploys on all platforms
- Less skills required by developers
- Less report redundancy
- Less time required to produce reports

ETL Process for Address

- Source:
  - Grantees: 2,700,000 address records
  - Financial (OCFO): 200,000 address records

- Result:
  - Unique addresses: 390,000 records
    - Street, city, state, zip
  - Locations: 92,000 records
    - Latitude/longitude
  - Areas: 4,100 records
    - Congressional district, county, and Native American Reservation

Geocode
Parameter: Match Modes

- The geocoder can perform matching algorithm based on the parameter passed along with the address object.
- The attribute "match_mode" in geocoding XML request tells the geocoder which matching algorithm to be used.

Mode	Meaning
EXACT	All fields provided must match exactly
RELAX_STREET_TYPE	Street type can be different from the official
RELAX_POI_NAME	POI name does not have to match exactly
RELAX_HOUSE_NUMBER	House number and street type do not have to match
RELAX_BASE_NAME	Base name, house number and street type do not have to match
RELAX_POSTAL_CODE	Postal code (if provided), base name, house number and street type do not have to match
RELAX_BUILTUP_AREA	Search the address outside the city specified, but within the same county, and includes RELAX_POSTAL_CODE
RELAX_ALL	Same as RELAX_BUILDUP_AREA
DEFAULT	RELAX_BASE_NAME

OBIEE Spatial
Challenges

- WE to AL characterset (Navteq in AL characterset).

- Create map tiles to improve speed.

- Geocode locations and areas to minimize spatial calculations.

- Confusion over locations appearing in county in one state and also in Congressional District in another state.

- Update congressional district. Saved old and can report.
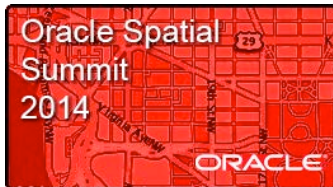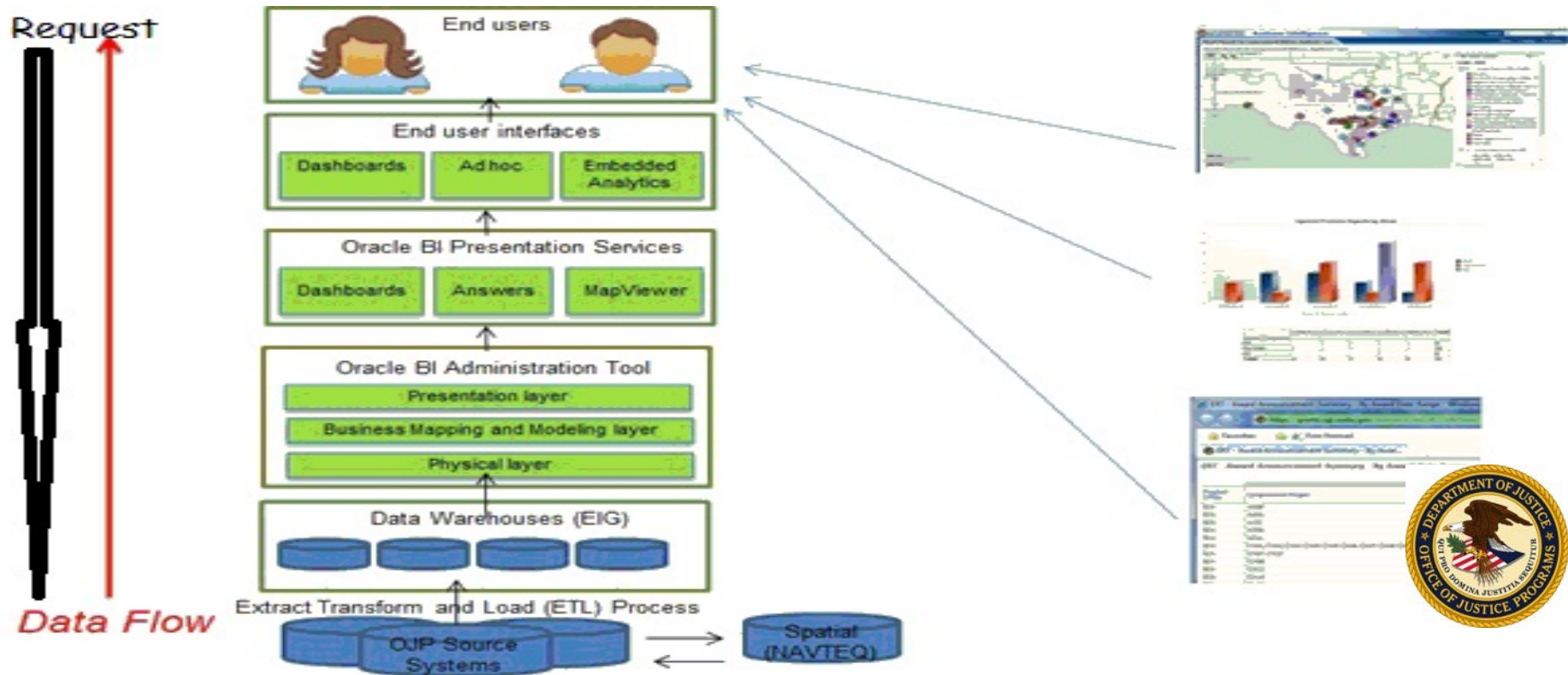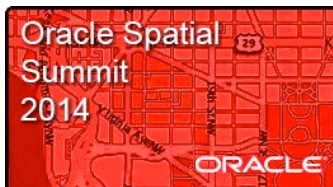
- Improved performance with IE10.

Architecture

- HERE (formerly Navteq) mapping data
  - Geocode addresses
  - Identify areas
    - County
    - Congressional district
    - Native American Tribe reservation

- Addresses from multiple sources
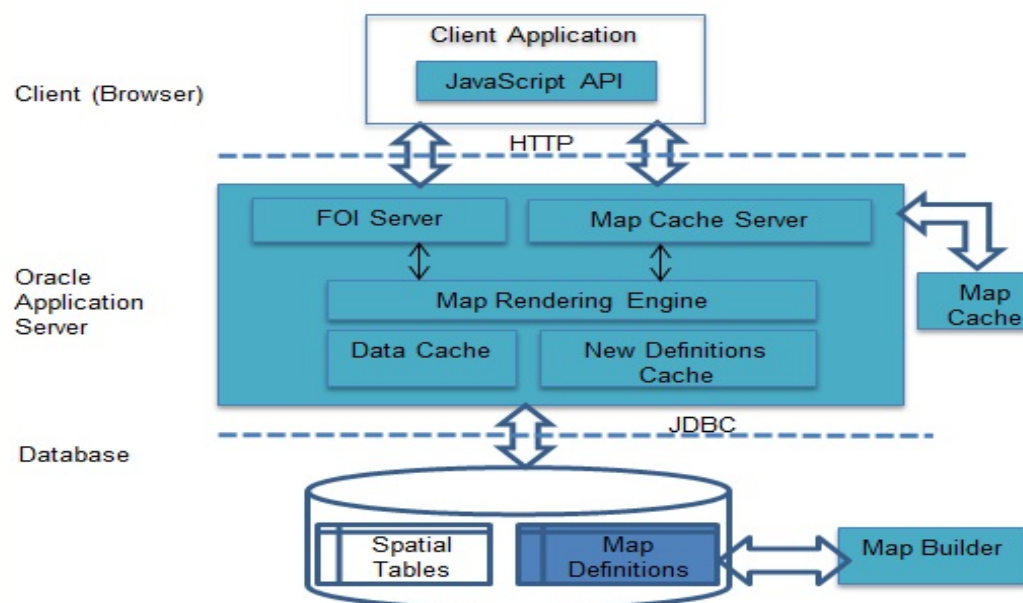- OBIEE with Oracle Spatial
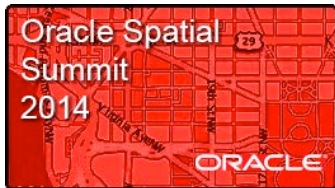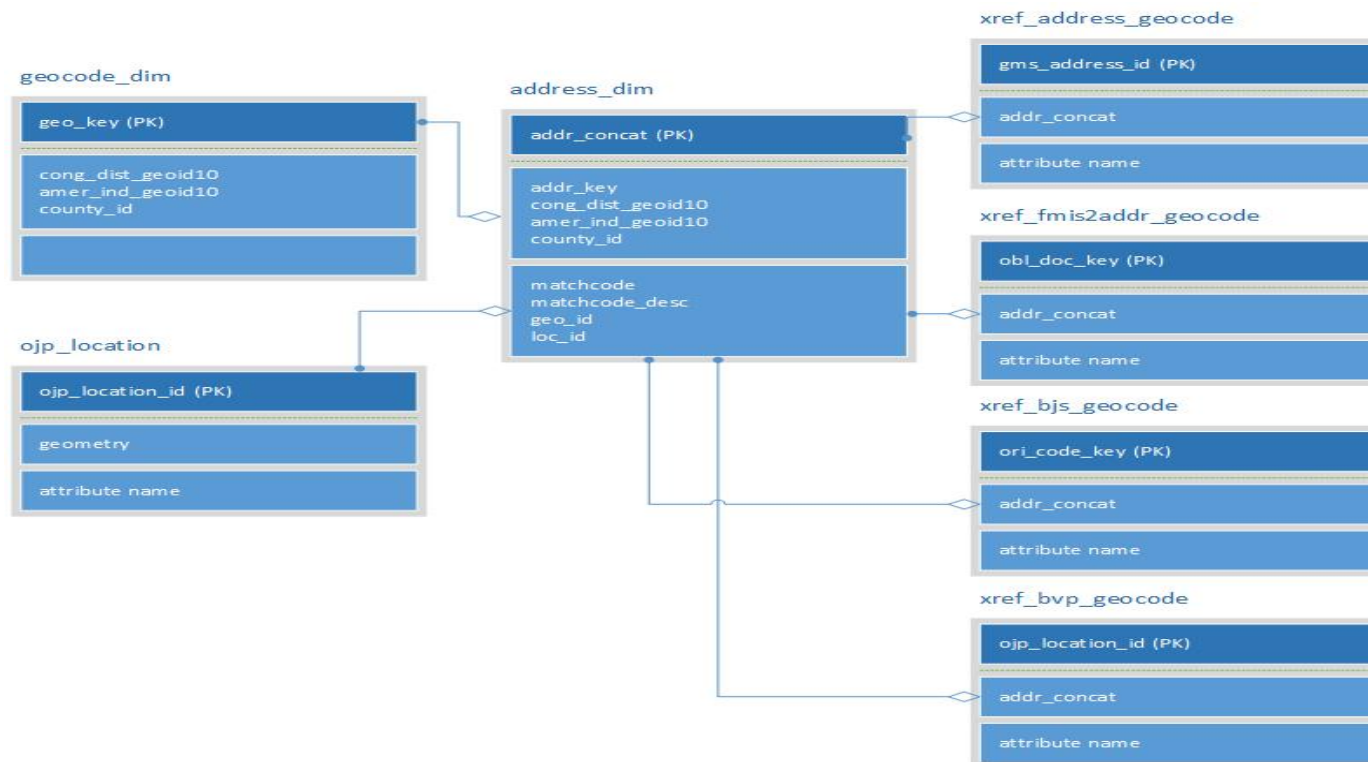- Map Builder
- Map Viewer
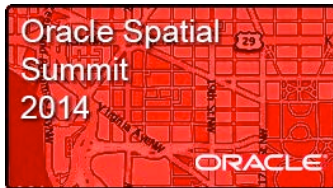
Architecture

Architecture

- Part of Oracle Fusion Middleware middle tier
- Includes a rendering engine
- Communicates with client web browser or application
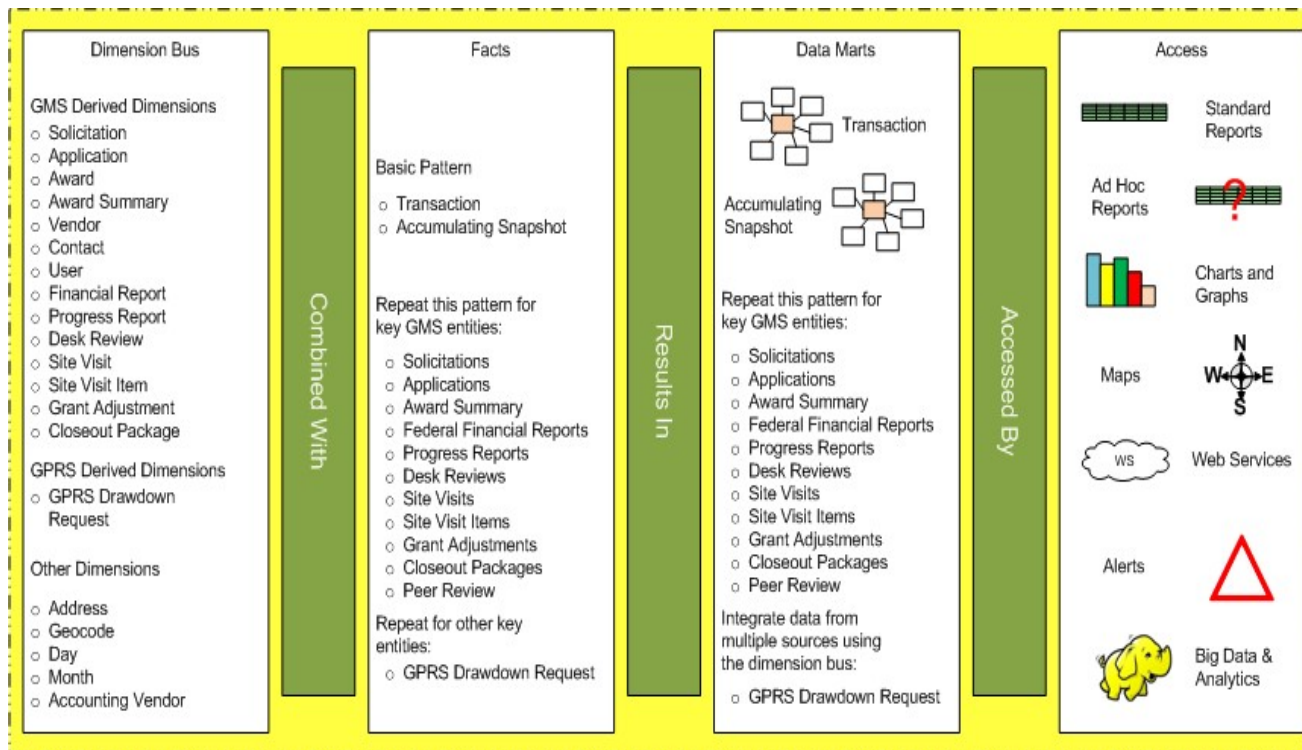- Performs spatial data access through JDBC calls to the database

Architecture

Multiple applications share geospatial
Data Mart Overview

- File Folder
- Self Service
- Standard Reports
- Award Selector

Q&A