

ORACLE®

S P A T I A L

May 2012
Oracle Spatial User Conference

A horizontal banner with a red background featuring a faint, detailed map of a city area. The text "Oracle Spatial User Conference" is written in large, white, sans-serif font across the center of the banner.

Oracle Spatial User Conference

May 23, 2012
Ronald Reagan Building and International Trade Center
Washington, DC USA



Eamon Walsh

CTO, eSpatial



GIS

Software as a Service

for Business
using Oracle in the cloud



Program Agenda

- Benefits of Geospatial cloud computing.
- The Challenge: GIS as Software as a Service to multi-user Businesses with complex needs
- Technical approach – Oracle in the Cloud
- Experience of implementing this solution, Issues found & lessons learnt
- The result – eSpatial OnDemand GIS



SaaS Economics

- Reverses Traditional Cost / Risk Models
- The Supplier takes on the risk of application development, IT costs, and deployment
- The Customer pays only for use





Benefits of SaaS for GIS

using Cloud Computing

- Lower Total Cost of Ownership
- Faster time to value
- Scales to your needs
- Reduces risk
- Enhanced data security and business continuity
- Always having the latest software release



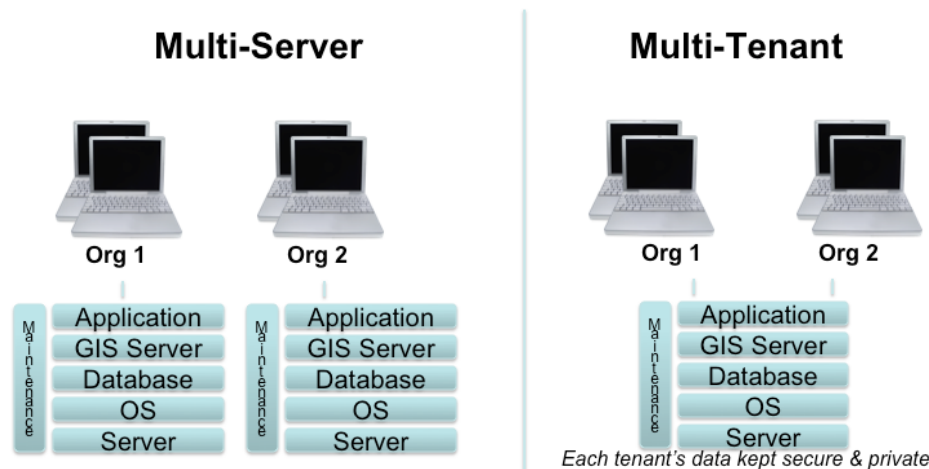
Challenge: Provide GeoSpatial Analytics as SaaS to Businesses

- “Business Data Mapping”, not traditional GIS
 - Use is Data Analytics & Data Visualization – Spatial
 - Complex spatial analysis for untrained business users
- 100% Web Delivered, including rich functionality
- Need to be able to scale
- Need to be cost-effective
- Very large Spatial databases
- Need to be Multi-Tenant



Need to be Multi-Tenant

Multi-Tenancy is how successful SaaS is built



- Costs per customer are much lower:
 - Share Server, License & IT costs
 - Eliminate customer Set-up & deployment time & costs
- Need Multi-Tenancy to deliver the benefits of Cloud / SaaS



Why Multi-Tenancy ?

Will change the GIS industry!

Old: Desktop → Server → Cloud-Hosted GIS

- Long, Costly, and Risky Enterprise GIS Projects
- Or very limited and inflexible web mapping

New: Multi-Tenant SaaS GIS in the Cloud

- Dramatically Lower costs – Initial and Ongoing
- Faster Time to Value
- Instantly available On Demand
- Flexibility to scale from smallest to largest groups



Why Oracle Spatial ?

Advantages of Oracle for Cloud Deployment

- Provides all spatial functionality required
- Already available on Amazon Cloud
- Highly scalable spatial DB – For large numbers of customers X large volumes of data
- Exploits parallel load and query
- Seamless high availability HA and security support
- Performance is readily tuned for different scaling needs



Technical Approach



Technical Approach - Overview

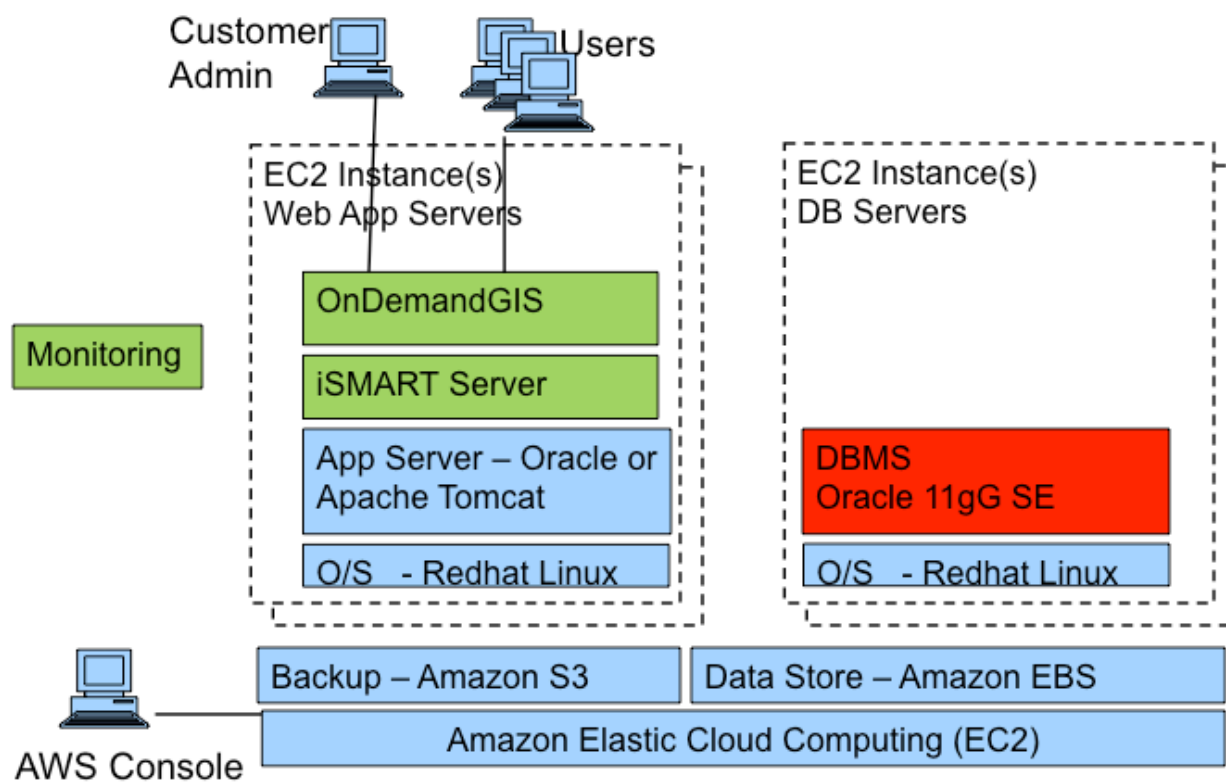
- Oracle Database with Spatial
- Deploy on Amazon EC2
- J2EE Web Application Server
- Multi-tenant Multi-user 100% Web software for Mapping and analyzing business data
 - eSpatial OnDemand GIS



Amazon Overview

- Elastic Cloud Computing (EC2)
- Variety of Instance Types (CPU cores, memory...)
- Pre-configured Amazon Machine Instances (AMI's)
- Availability Zones...
- Elastic Block Storage – EBS
- Simple Storage Service (S3)
- Elastic IP addresses
- Load Balancing & Scaling, More...

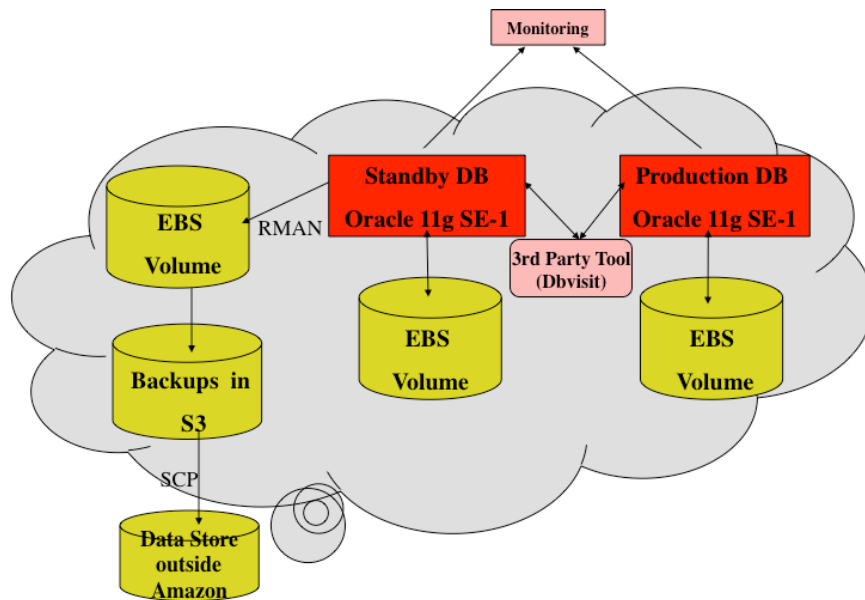
Application Deployment Overview





Oracle Deployment Overview

on Amazon



- Dedicated Database Server(s) with separate Web Application Servers
- AMI - Oracle 11g DB & Redhat Fedora
- Database on an EBS volume
- ARCHIVELOG as normal – archive to a separate EBS volume
- RMAN Backup to separate EBS volume
- Copy backups to Amazon S3
- EE & RAC or SE-1 with Standby DB
- Backup from Standby DB



eSpatial's Experience Implementing the Solution

- Have deployed eSpatial OnDemand GIS (early 2011)
- Using Oracle on Amazon
- 1000s of users. 10' s – 100 trying it each day



Challenges, Issues, Lessons learnt

- Challenges overcome
 - No knowledge of or physical access to the servers & storage
 - Backup
 - Security
 - Manage load on database that each user can generate (complex spatial analyses)
- Issues to be aware of
 - AMI's are not guaranteed to be permanent – cannot rely on their store
 - Amazon have a lot of \$ meters...
 - You are responsible for securing your servers
- Lessons learnt
 - Restrict Access to AWS
 - Secure your AMI's – no telnet
 - Need to monitor & respond



Recommendations, Tools

- Build your own AMIs
 - Restrict access to AMI's - ssh
 - Use AWS Identity & Access Management (IAM)
 - Automatically Monitor Application Health
 - Have a 24x7 response in place
 - Build a Cost model
 - Monitor usage of Amazon services + user activity
- Useful Tools:
 - Oracle Enterprise Manager (“reduced” in SE1)
 - AWS Management Console
 - Amazon CloudWatch
 - ElasticFox
 - Nagios



The eSpatial Solution

eSpatial OnDemand GIS

Live on-line + Free Trial



Start Instantly On-line

Get started now!

First name:

Last name:

Email:

Organisation:

Country:

Password:


Confirm Password:




☐ I agree to the [terms and conditions \(Click to View\)](#).

We will never share these details.



NOT

Before you can start using  GIS Server on Amazon EC2, follow these steps

1. Get an Amazon Web Services (AWS) account*.
2. Contact  Customer Service and provide your AWS account information.
3. We'll provide you with ready-to-use  GIS Server and enterprise  database images in the Cloud.

OR

Talk to your local sales representative and discuss your options

Instant Access to the Application

The screenshot shows the eSpatial OnDemand GIS application running in a Firefox browser. The browser's address bar displays the URL: `ondemandgis.espacial.com/ismar`. The application interface features a map on the left side, a central help panel, and a right sidebar with a chart.

eSpatial OnDemand GIS™

Help guides

- Get Started**
 - Overview of the Application
 - Navigate Around the Map
 - Select What to Show on the Map - "Layers"
 - Get Information About Features on the Map
 - Find an Address
 - Print the Map
 - Set my Preferences
- Load and Display my Data**
 - Import Addresses and Data from a File
 - Import a Shapefile
 - Create a new Map
- Analyze my Data**
 - Create a Parameterized Query
 - Create a Location-based Query
 - Add a Chart to my Query
 - Color my Map based on Data (Thematic)
- Add and Update my Data**
 - Draw "Redlining" on the Map
 - Draw and Edit Features on my Map
 - Create a new Layer on the Map
- Manage my Account**
 - Manage my Maps
 - Manage Multiple Users

[View full, technical help](#)

☒ Don't show me this start screen next time I log in. (Click "Help" to show this at any time)

Get help with a data upload

We're here to help you!

[Request a call](#)

[Request help to upload data](#)

Watch short videos on how to upload data

CSV file with addresses CSV file with x & y coordinates GIS file

[More videos >](#)

education

Median House...

16.5 19.03 21.57

s Degree

Clear Results

ate To

[Clear Edits](#) [Save Edits](#)

[Info](#) [Thematics](#)

[mon TEST](#) | [Log Out](#) | [Help](#)

Transform data into actionable insights with eSpatial OnDemand GIS™.

<http://www.espacial.com/OnDemandGIS/BlueScreen/help.html> | Inter: 30.74,-97.21 (Lat,Long) | (8307) | Map Projection: Mercator_Sphere

eSpatial OnDemand GIS™ Version 7.0.6.49

Load your Data

Firefox | eSpatial OnDemand GIS™

ondemandgis.espacial.com/ismart/iSmartWebGIS/pages/...#

Microsoft Powerpoint 2000 pptx converter

Ask a Question | Give Feedback | Eamon TEST | Log Out | Help

Undo Redo Clear Edits Save Edits

Search Layers Info Thematics

Refresh Map

Configure Layers

Grouping Layer Draw Order Layer Legend

Base Map Layers: Google Streets

Aa

State Demographics

County Demographics

Zip Code Tabulation Area Demographics

Administrative Boundaries

Redlining

mydata.csv

11.06 : 31330

mydata.csv

Results 1 to 1 of 1

Upload File to S...

C:\Users\EamonD...

Help

0 1000 2000

Google

kms

Medellin

Garagoa

Bogota

Calo

Colombia

USA

Powered by eSpatial

Base Map Scale: 1:34942641.00 | Center: 30.74,-97.21 (Lat,Long) | (8307) | Map Projection: Mercator_Sphere

eSpatial OnDemand GIS™ Version 7.0.6.49

Add File to Layer

Create Layer From a CSV File (Import CSV File)

To create a CSV file from an Excel spreadsheet click on File / Save As... and select Format 'Comma Separated Values (.csv)'.

Options:

☒ New Layer ☐ Existing layer ☐ Link to layer

Available CSV Files

Filter

Files

mydata.csv

Results 1 to 1 of 1

Upload File to S...

C:\Users\EamonD...

File Upload

Oracle SUG 2012 > Inputs

Search Inputs

Organize New folder

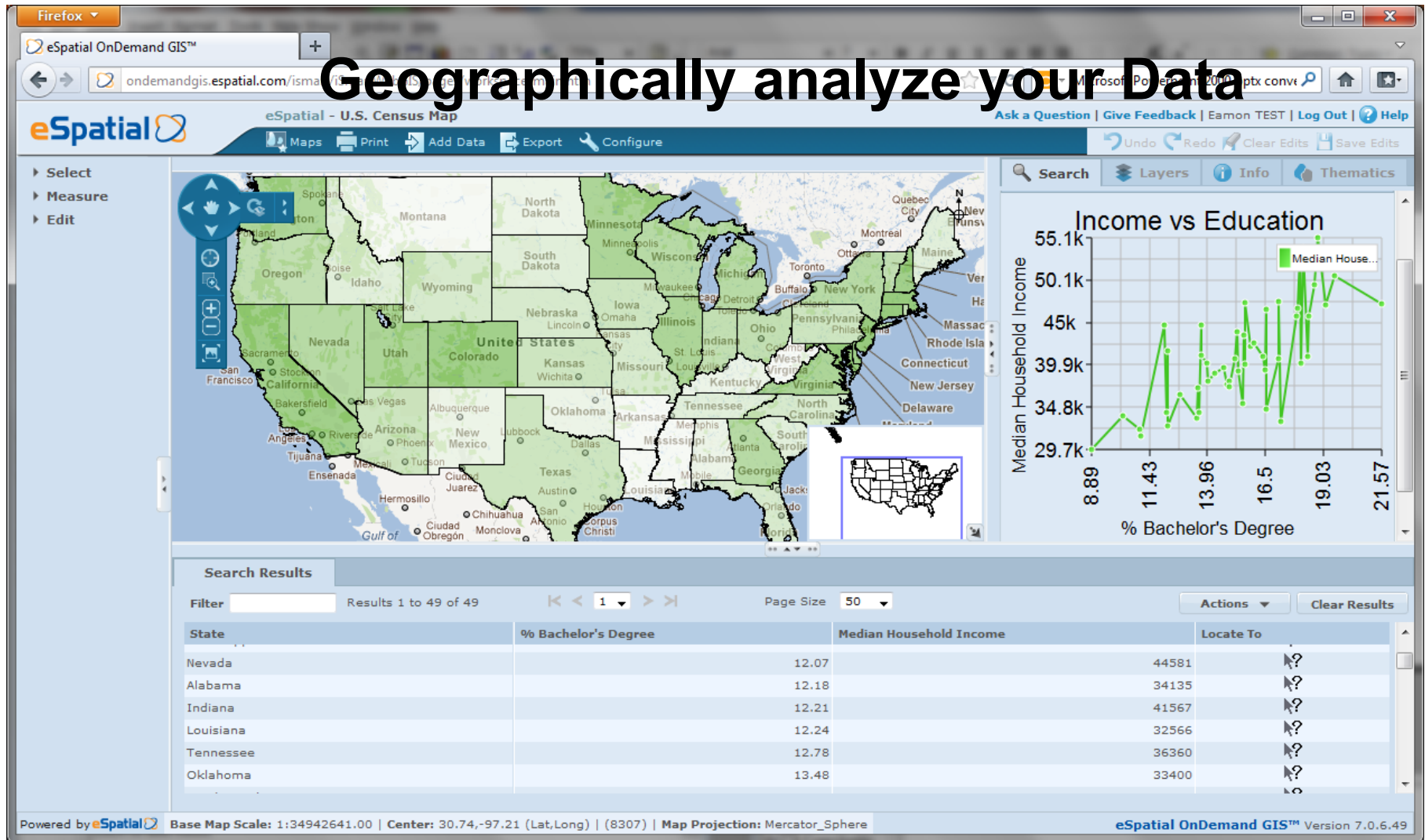
Name	Date modified	Type	Size
.DS_Store	22/02/2012 16:33	DS_STORE File	7 KB
eSpatial OnDemand GIS	12/05/2011 11:01	MP4 Video	50,936 KB
latLonHaringey	04/04/2012 12:27	Microsoft Excel C...	3 KB
Login	18/04/2012 13:05	Microsoft Word D...	300 KB
my data	18/11/2011 12:12	Microsoft Excel C...	73 KB
Oracle Spatial UC GITA 2011 B	29/03/2011 11:38	Microsoft Word D...	70 KB
oracle_spatial_conf_espacial_2011 May19	18/04/2012 11:18	Microsoft PowerP...	3,997 KB
oracle_spatial_conf_espacial_2011 May19	19/05/2011 13:08	Microsoft Office P...	3,858 KB

File name: my data

All Files

Open Cancel

Geographically analyze your Data

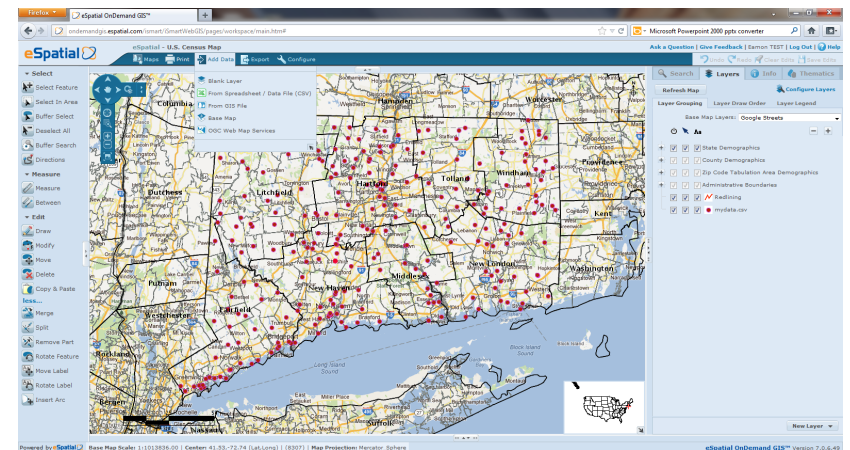
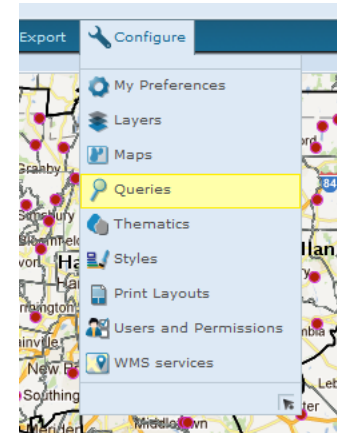




Do More

Rich set of functionality

- Style Maps
- Define Queries & Reports
- Add more users for your organization + control access
- Share – internally & externally
- Load business & GIS data
- + Compare data to demographic and other data from eSpatial





Some Customers





D E M O N S T R A T I O N

eSpatial OnDemand GIS



Where Next?

Continuing to grow the Service

Will Provide:

- Richer Analysis functionality
- Improved Ease of Use
- Access for Developers
- Vertical Applications



eSpatial' s Experience

eSpatial OnDemand GIS

- **Business Mapping is Not GIS**
 - New Users, New Uses, New Expectations
- **Want solution for a Task** – Not a General-purpose tool
- **Wide variety of Business Tasks**
 - Configure what's provided BUT hide this from the user
 - Need rich set of functionality
- **Includes complex spatial analysis of business data**
- **Want it to be Easy** - Intuitive
- **Want it On Demand**
- **Want to Share it with Everyone** – High load peaks



Conclusion

- There is a demand for GIS as an On Demand service to organizations ranging from individuals to thousands of users, at low cost.
- The requirements for this are very different from traditional GIS, and are very challenging.
- Can deploy Oracle in the cloud on Amazon EC2 to achieve this.

Q&A



Thank You

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eSpatial OnDemand GIS



OVERVIEW

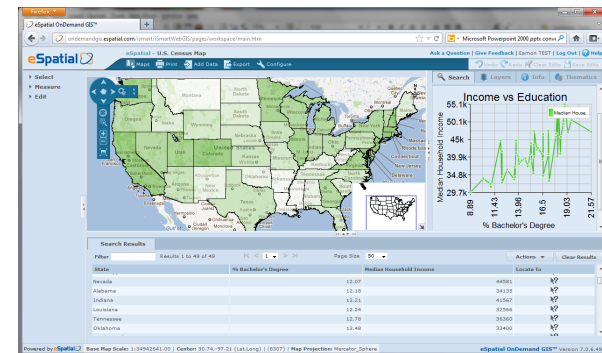
- Central database in the cloud for SaaS mapping service
- Multi-tenant SaaS Incorporates 1000s and growing number of multi-user accounts, each with sub-groups of users
- Supports Customers (Tenants), User-Groups, Users

CHALLENGES / OPPORTUNITIES

- Need scalability, security for multiple customers' data
- Customers can load disparate data sets
- Geo-code address data and also load GIS data
- Customers can define arbitrary spatial reports and queries
- Customers can define arbitrary maps

SOLUTIONS

- Oracle in the cloud on Amazon
- Oracle SaaS for ISVs licensing
- Oracle Database
 - Oracle Locator
- Replica database



RESULTS

- Business Mapping SaaS based on Oracle in the cloud
- Large number of customers' data in central repository
- Disparate business and GIS datasets for each customer
- Standard GIS and other (such as demographic) datasets provided to all customers
- Provide Customers with ability to understand their activities in context of location
- Geo-code customer business data to allow for location-based analysis
- Customer ability to define maps, queries, and reports to analyze their data



Cloud Computing, Software as a Service (SaaS)

Cloud Computing

- Computing Infrastructure from the Internet – “the Cloud”
 - Generally virtual Servers
- Scale Dynamically – “On Demand Servers”

Software as a Service – SaaS

- Subscribe to an application for use On Demand
- The application is often run in the cloud