Big Data, Cloud Computing, Spatial Databases
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Big Data: Global Digital Data Growth

Growing leaps and bounds by 40+% Year over Year!

2009 = .8 Zetabytes
= .08 ZB Structured Data
= .72 ZB Unstructured Data

2020 = 35 Zetabytes
= 3.5 ZB Structured Data
= 31.5 ZB Unstructured Data*

(1 Zetabyte = 1 Trillion Gigabytes)

LEGEND
- Structured Data
- Unstructured Data

• Chart conservatively assumes a constant 9:1 ratio of unstructured data vs. structured data (based upon IDC’s estimate that 90% of all digital data is unstructured).
• Chart does not reflect IDC’s projection that unstructured data is currently growing twice as fast as structured data at the rate of 63.7% vs. 32.3% CAGR.

Source: IDC Digital Universe Study, A Digital Universe Decade – Are Your Ready?, 2010
Big Data - Diverse Types & Response Time Requirements

Semantic Graphs – Connect the Dots

Social Data

Geospatial – Where is it Happening?
In What Context?
Raster
LIDAR

Video / UAV

Machine Generated Data /Sensors

Big Data: Decisions based on all your data
Big Data: DHS Risk Analysis

Real-time Data Streams

External Data Sources
- Transactional & Operational Systems
- Contents Repository
- Databases
- Web resources
- Blogs, Mails, news

Search, Presentation, Report, Visualization, Query

BI

Enterprise Data Management Infrastructure

GeoSpatial
- POIs
- Demographics
- Customer Data
- Call Records

Documents

Secured
- Historical Records

Automated Responses and Publishing

SMS
Console Alerts

EV Grid Management
Workflow Initiation
Real-time Dashboards

ORACLE
Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

This cloud model promotes availability and is composed of:

5 Essential Characteristics
- On-demand self-service
- Resource pooling
- Rapid elasticity
- Measured service
- Broad network access

3 Service Models
- SaaS
- PaaS
- IaaS

4 Deployment Models
- Public Cloud
- Private Cloud
- Community Cloud
- Hybrid Cloud

Source: NIST Definition of Cloud Computing v15
Traditional Large Computing Environment (No Cloud)

- Silos of dedicated hardware and software
- Single application per silo
- Difficult to size for peak load
- Difficult to scale
- Expensive to manage
Why a Cloud Framework Make Sense

• **Reduced Cost**
  Cloud technology is paid incrementally, saving organizations money.

• **Increased Storage**
  Organizations can store more data than on private computer systems.

• **Highly Automated**
  No longer do IT personnel need to worry about keeping software up to date.

• **Allows IT to Shift Focus from Maintenance Activities**
  No longer having to worry about constant server updates and other computing issues, government organizations will be free to concentrate on innovation.

• **More Mobility for Users**
  Employees can access information wherever they are, rather than having to remain at their desks.
3 Cloud Computing Concepts

- **Application as a Service (SAAS)**
  - End user apps delivered as service
  - Example: Google Earth

- **Platform as a Service (PAAS)**
  - Application platform middleware for developers to deploy custom apps
  - Example: Oracle Public, Private Cloud

- **Infrastructure as a Service (IAAS)**
  - Hardware and technology for computing power, storage, operating systems available for customer apps
  - Example: Amazon EC2, Amazon S3
Cloud Platform Framework for GeoSpatial

- Follow the Standards – ISO / OGC!

- **Application Server**: SOA, Identity Management, OGC Web Services, Geocoding, Routing, Java and XML Frameworks, Process Execution, Portals; Java, XML, C, and .Net APIs
- **Massively parallel**, highly available, scalable processors and storage.
Public Cloud - Security Concerns:
An Option is a Private Cloud

- Application Security
- Vulnerability Management
- Data Privacy
- Identify Management
- Data Storage
- Data Transfer
- Liability and Recourse
- Personnel and Physical Security
Cloud: Leveraging Semantic Web

National Mapping Private Cloud

- Simple Features
- GeoRaster
- Topology
- Networks
- Gazateers
- ...

 RDF & OWL Metadata

- Data Integration
- National Map schemas
- Geographic names
- Temporal
- Naïve Geography
- ...

Application Ontologies

Environmental Monitoring

Famine Relief

Disaster Response

Geographic Names
Spatial Data
Raster Data
Cloud: It’s Not Just about “Static Linking”
“Semantic Cities *”

- Integrate domains of knowledge through common vocabularies (ie SKOS)
- Manage relationships between collections of images and associated metadata
- RDF as flexible and extensible data model supports powerful search and end-user discovery of related content
- Rich platform for data integration, data repurposing, and better quality control and classification

* Bentley
Big Data and Cloud Computing
Next Generation Enterprise Data Platform

- Drive Business Value
- Deliver Top Line Growth

- Drive Business Efficiency and Agility
- Deliver Bottom Line Savings

CIO

Big Data

Private Cloud

Secure

Business Value
Welcome to the
Oracle Public Cloud
An Enterprise Cloud for your Business

Application Services

Fusion CRM
Sell smarter with Fusion CRM in the cloud.

Fusion HCM
Bring power to your people with Fusion HCM.

Social Network
A secure collaboration tool for everyone you work with.

Platform Services

Java
All the productivity of Java, without the IT.

Database
The Oracle database you love, now in the cloud.

For information about Oracle's other offerings for cloud computing, go to oracle.com/cloud
Oracle Big Data, Cloud, Spatial Complete Platform

Big Data Appliance
- Cloudera’s Distribution including Apache Hadoop
- Oracle NoSQL Database
- Open Source R
- Applications

ACQUIRE

Exadata
- Oracle Big Data Connectors
- Oracle Data Integrator
- Oracle Database
- In-Database Analytics
- Oracle Advanced Analytics
- BI
- Data Warehouse

ORGANIZE

Exalytics
- Analytic Applications
- Alerts, Dashboards, MD-Analysis, Reports, Query Web Services
- BI Abstraction

ANALYZE

DECIDE

Oracle NoSQL is based on Berkeley DB
Cloud Sessions this Conference

- ORACLE
- THURSDAY 2:00 PM
- FRIDAY 9:00 AM
http://otn.oracle.com