



# Grid or Cloud What's the difference?

Cathy Pickering  
Cloud Architect  
Oracle South Africa

**ORACLE®**  
SOFTWARE. HARDWARE. **COMPLETE.**

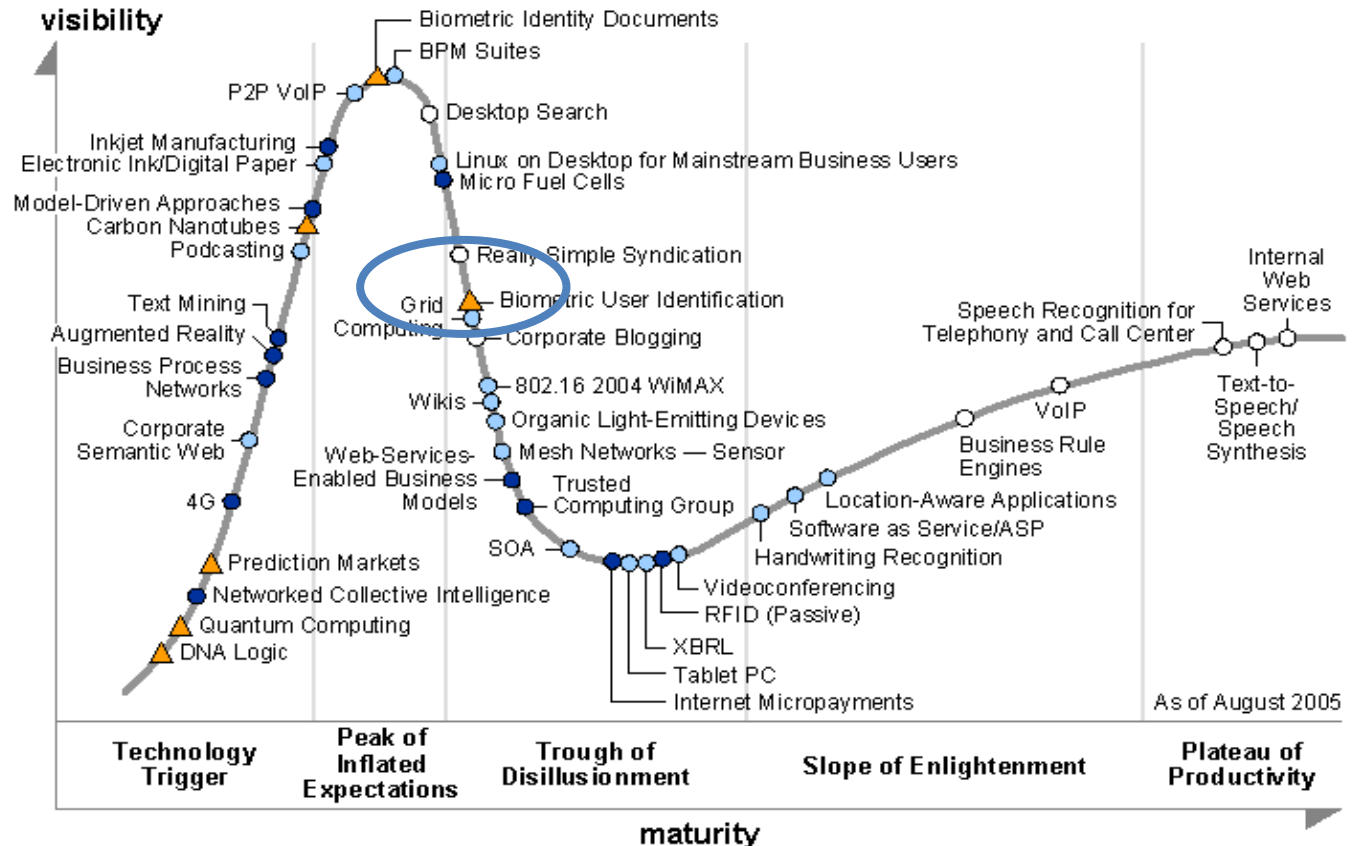


# What is Grid?



# Hype Cycle for Emerging Technologies, 2005

Source: Gartner (August 2005)



Plateau will be reached in:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

### Acronym Key

- 4G** fourth generation
- ASP** application service provider
- BPM** business process management
- P2P** peer to peer
- RFID** radio frequency identification

- SOA** service-oriented architecture
- VoIP** voice over Internet Protocol
- WiMAX** Worldwide Interoperability for Microwave Access
- XBRL** Extensible Business Reporting Language



# What Is Grid Computing?

Grid Computing is a technology architecture that virtualizes and pools IT resources, such as compute power, storage and network capacity into a set of shared services that can be distributed *and re-distributed* as needed.

## Key Characteristics of Grid Computing:

- Standardization
- Virtualization
- On-Demand Provisioning
- Automation of Systems Management
- Real-time and Predictive Monitoring



# What Is Grid Computing?

“In basic terms, grids are:

clusters of interconnected servers, enabling shared computing resources utilization”

*“Defining Grid Computing”, Giga Research, August 2002*



# Grid Computing Vision

- Computing as a utility
  - A network of clients and service providers
- Client-side: Simplicity
  - Request computation or information and receive it
- Server-side: Sophistication
  - Availability, load balancing, utilization
  - Information sharing, data management
- Virtualization
  - Clients see a large virtual server
  - Underlying infrastructure hidden





# Benefits of Grid Computing

- Better information faster
  - Perform more work with fewer resources
  - Spread work across resources
  - Access to resources on demand
- Faster response to changing business priorities
  - Instantly and dynamically realign IT resources as business needs change
- Reduced IT costs
  - Improve utilization of existing resources
  - Utilize less expensive commodity platforms



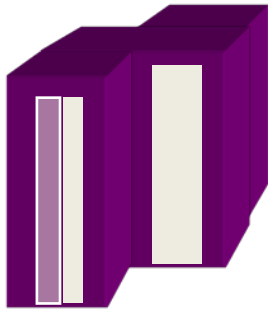
# Enterprise Grid Computing

- Standardization
  - Standard blade servers, Linux
  - Fast interconnects for storage and network
- Virtualization and provisioning
  - Resources dynamically assigned
  - Realign IT resources as business needs change
- Scale out
  - Add additional resources to grow capability of system

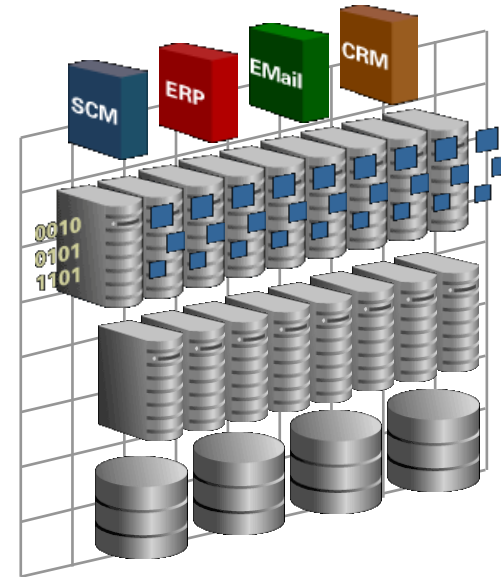
# Utility Computing



## Mainframe/Big SMP



## Grid Computing



- Partitioning a big server
- Expensive and high quality components
- Complete, integrated, proprietary
- Enterprise service at high cost

- Sharing many small servers
- Inexpensive and high quality, modular components
- Complete, integrated, open
- Enterprise service at low cost

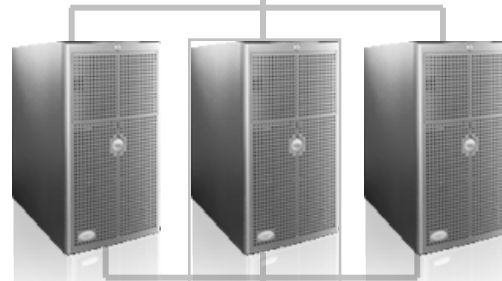


# Grid Computing

Fusion Middleware



Real Application Clusters



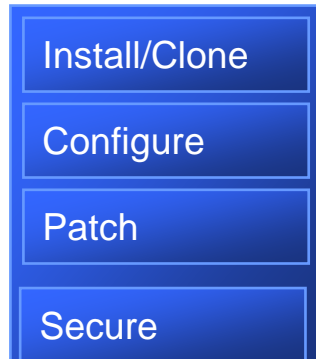
Automatic Storage Management



Grid Control



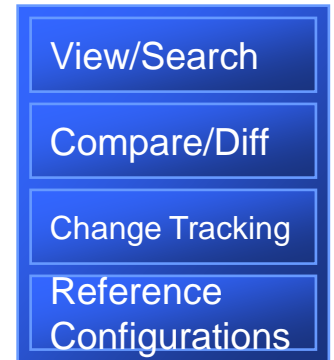
# Enterprise Configuration Management



Grid Control



Policy Manager



Foundation for compliance and change control



# The Move to Enterprise Grids

**Grid as solution to massively parallel problems:**

Desktop Grids:

SETI@home Scientific

Research Grids:

Globus Toolkit

Grid Prototypes:

IBM Global Services

**Grid as evolution in infrastructure platform for data centers:**

- All Oracle-based applications including packaged applications
- Low-cost hardware platform clustered database, app servers + storage,
- Entire IT management
- Incremental adoption of grid features





# Mercado Libre



- eBay in Latin America – 30% eBay ownership
- Runs online marketplace on RAC
- 4 X Annual Volume Growth
- Started: 2 nodes, grew incrementally
- Current: 7 node Linux HP Itanium 2 (4 way) running on Network Appliance
- December 2005:
  - 2 large RAC clusters (8-10 nodes each)
  - + small cluster (3 nodes)



# Amazon.com



- OLTP
  - CATalog database, CUSTomer database, and ACB database (order, shipment, and payment information) – 4 node clusters
- DW
  - Query
    - 16 nodes, 23 TB DB (68 TB disk)
    - 50,000 queries/week (mostly complex)
  - Historic Clickstream:
    - 4 nodes, 17 TB DB (42 TB disk)
    - 3-15+ month old clickstream data stored
  - ETL:
    - 8 nodes, 7 TB DB (36 TB disk)
- Migration from SMP to HP/Linux/RAC saved \$6M (\$2.5M vs \$8.5M) in capital costs alone



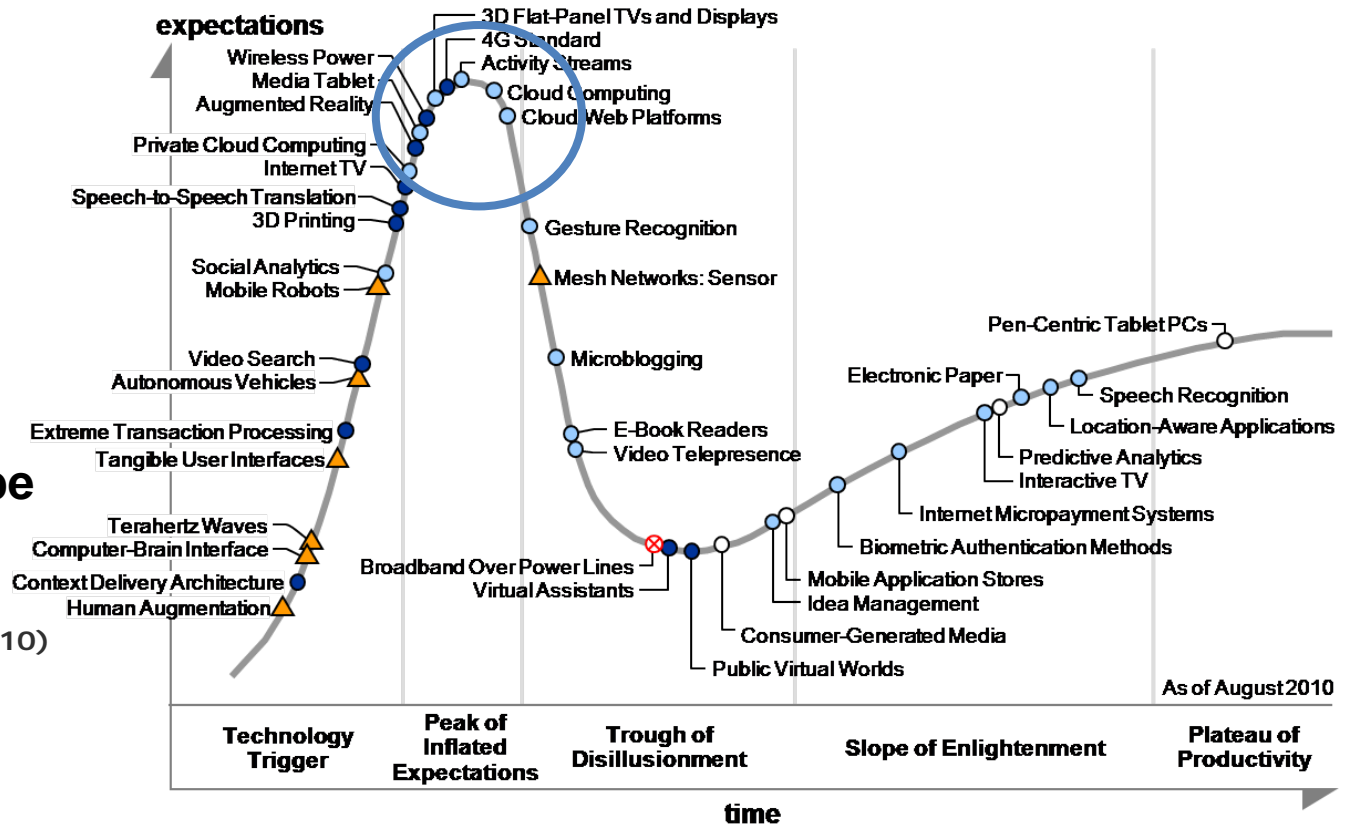
# What is Cloud?



# Cloud Is at the Peak of the Hype Cycle

## Gartner's Emerging Technology Hype Cycle for 2010

Source: Gartner (August 2010)



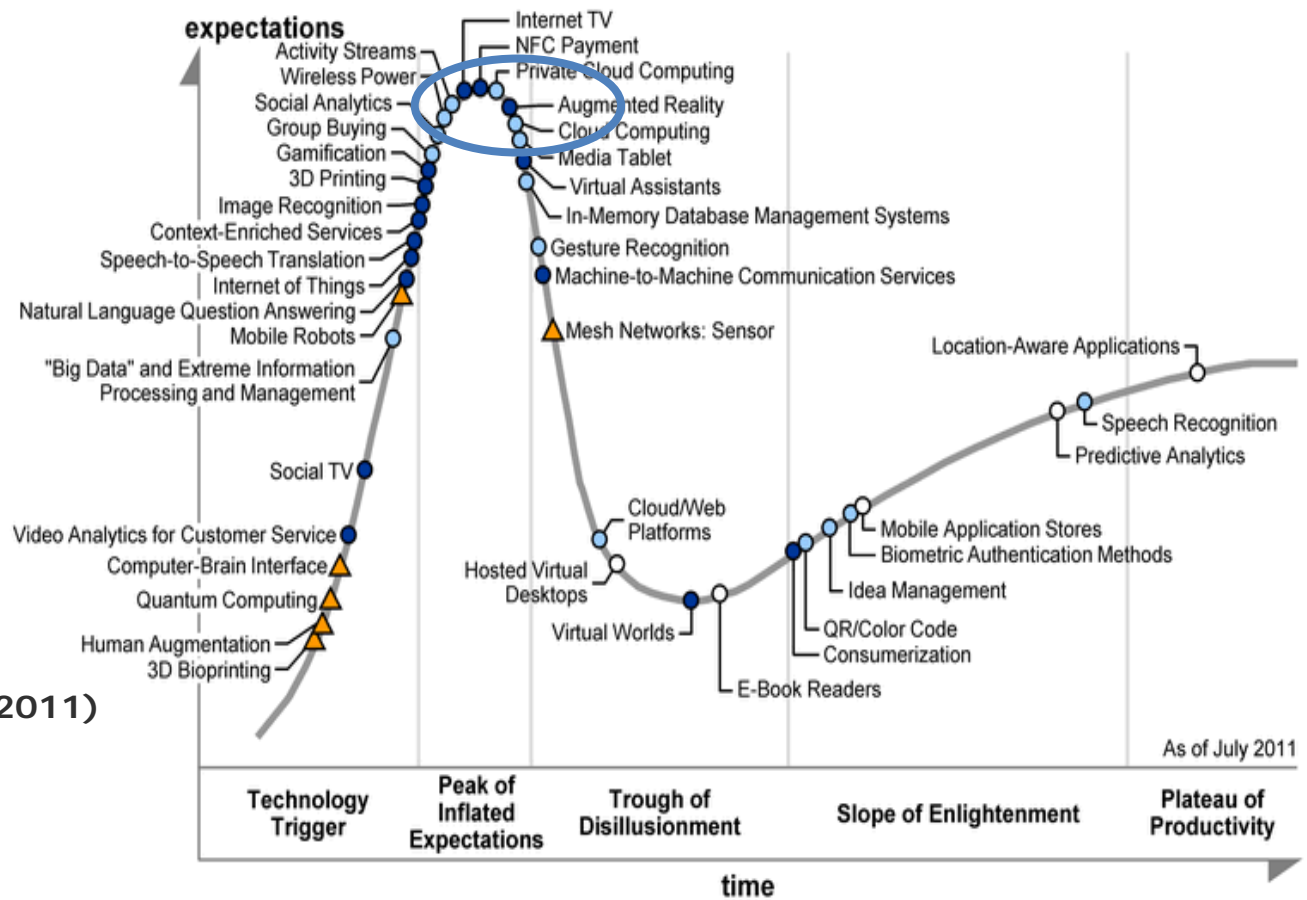
Years to mainstream adoption:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau



# Gartner's Emerging Technology Hype Cycle for 2011

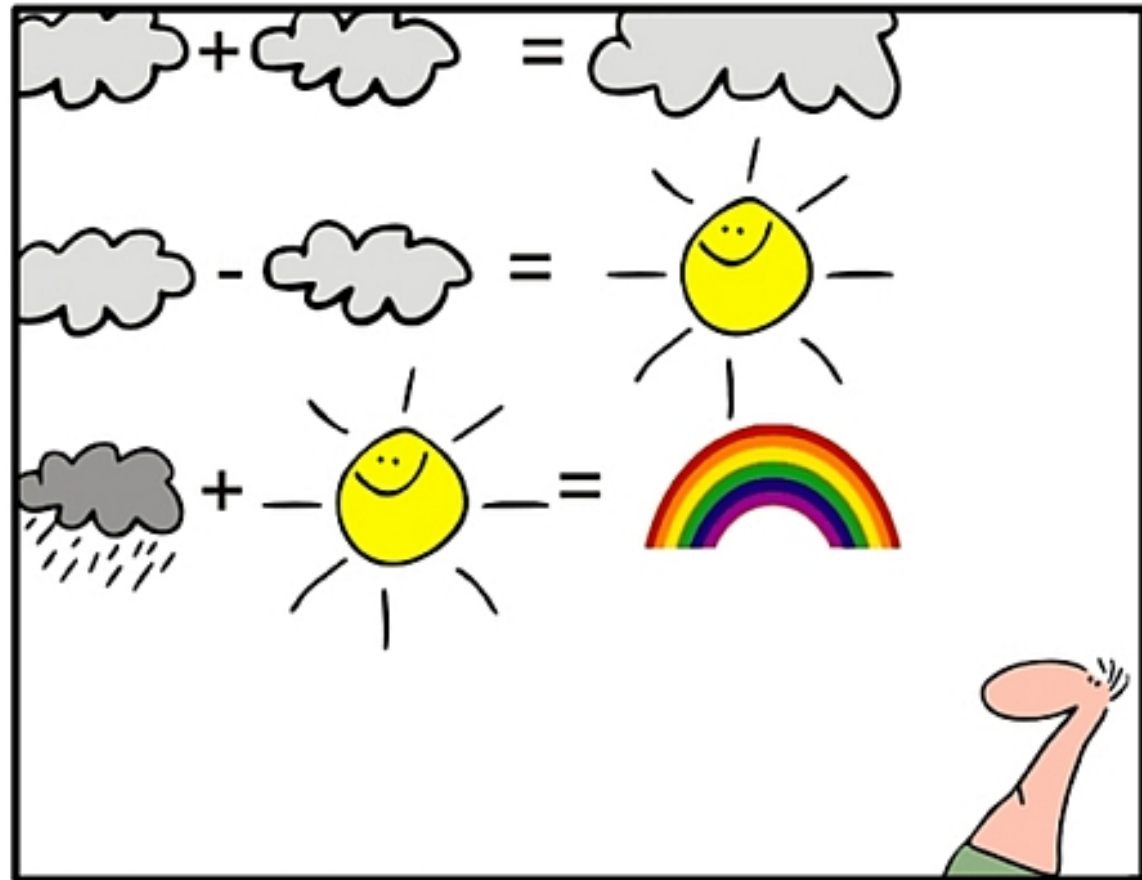
Source: Gartner (August 2011)



Years to mainstream adoption:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

# What is Cloud Computing?



***SIMPLY EXPLAINED - PART 17:  
CLOUD COMPUTING***





# What Is Cloud Computing?



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



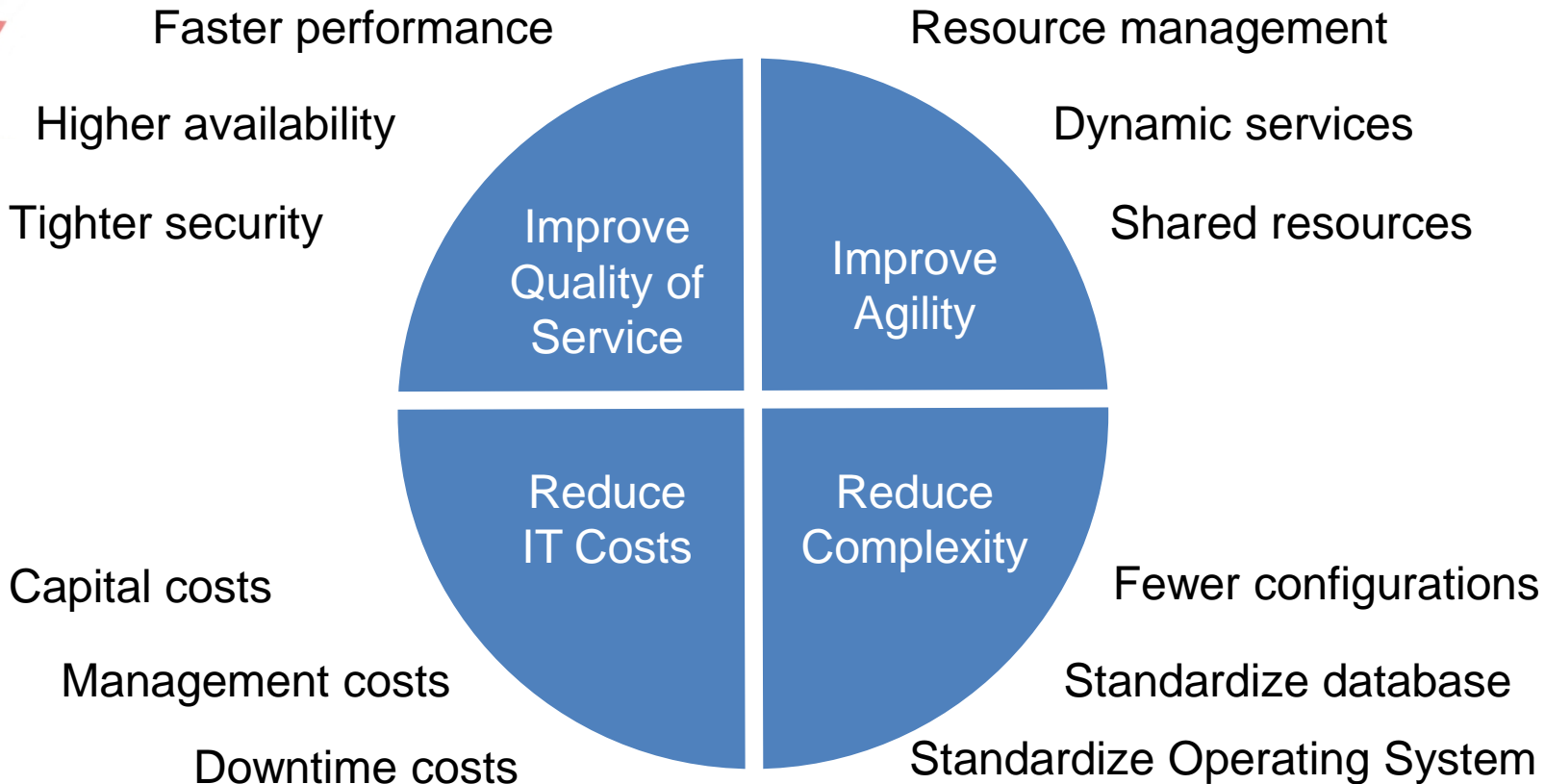
deliver the

**PROMISE**

[www.saoug.co.za](http://www.saoug.co.za)

# Private Database Cloud

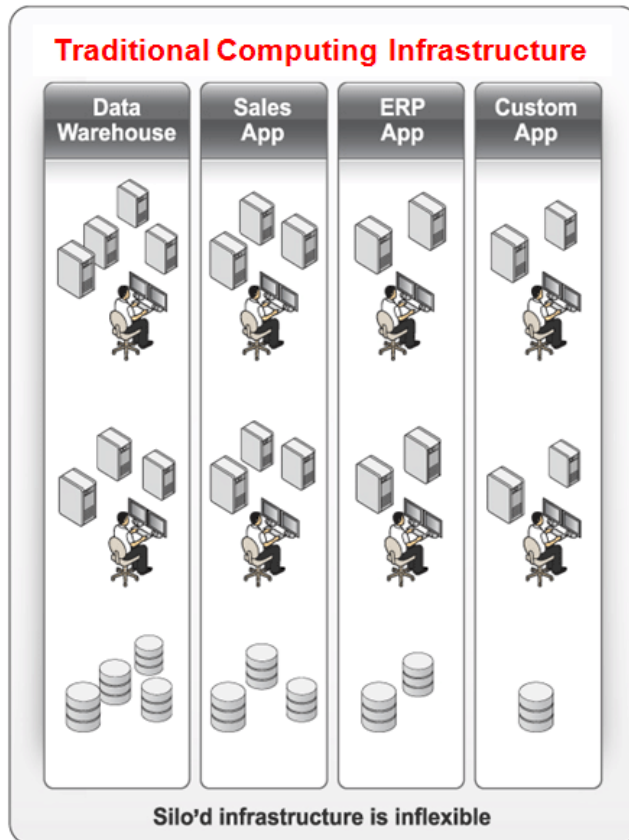
## Business Drivers





## Traditional Computing Environments

### Silos of hardware, storage, software & applications



- Sized for individual peak loads
  - Inefficient and expensive
- Meet changing business needs?
  - Inflexible and unresponsive
- Expensive to manage
  - Too many moving parts



# Grid Computing

## Virtualizes and Pools IT Resources

### Grid Computing in All Tiers

#### Middleware

- Application Grid
  - WebLogic Server
  - Coherence In-Memory Data Grid
  - JRockit Real Time
  - Tuxedo

#### Database

- Real Application Clusters
- In-Memory Database Cache
- Sun Oracle Database Machine

#### Storage

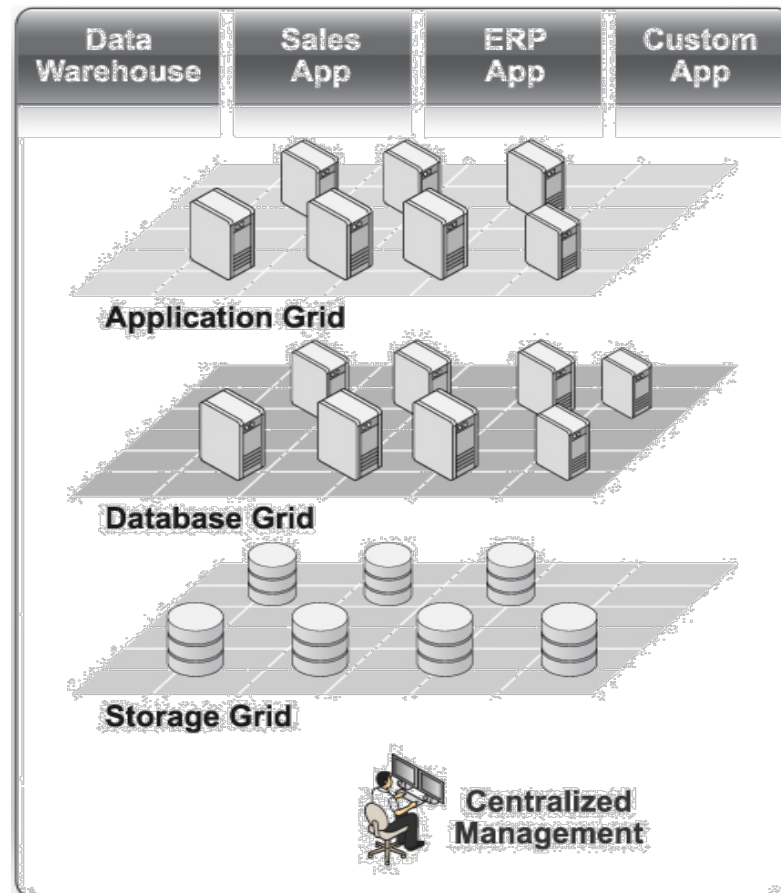
- Automatic Storage Management
- Exadata Storage Server

#### Infrastructure

- Oracle VM
- Oracle Enterprise Linux, Solaris
- Sun Servers, Storage and Networking

#### Management

- Oracle Enterprise Manager



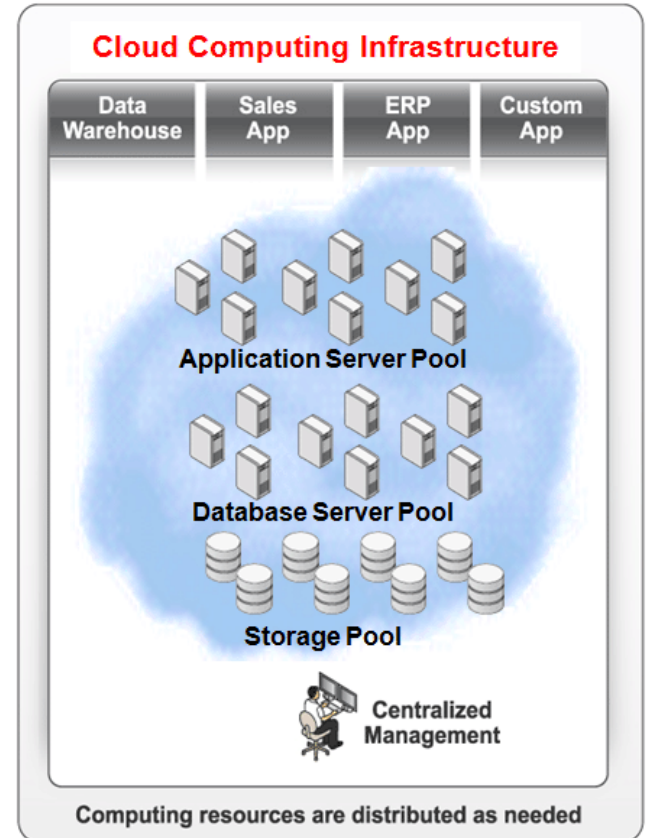
- Pools of shared resources
- Re-distribute resources as needed
- Cost efficient



## Cloud Computing Environments

Reduced complexity & costs,  
higher quality of service

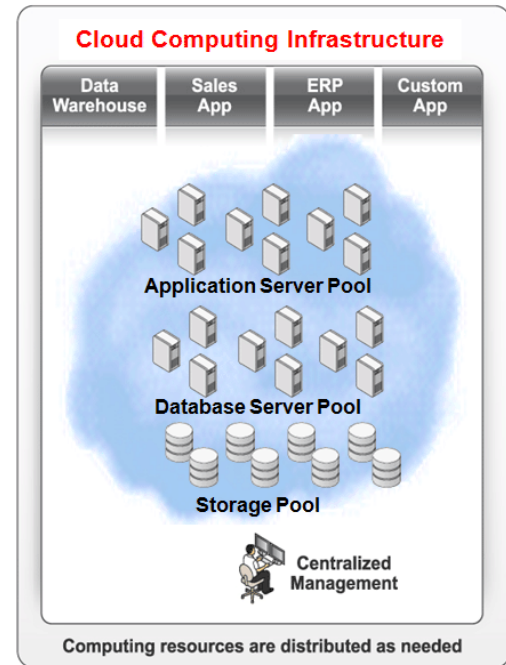
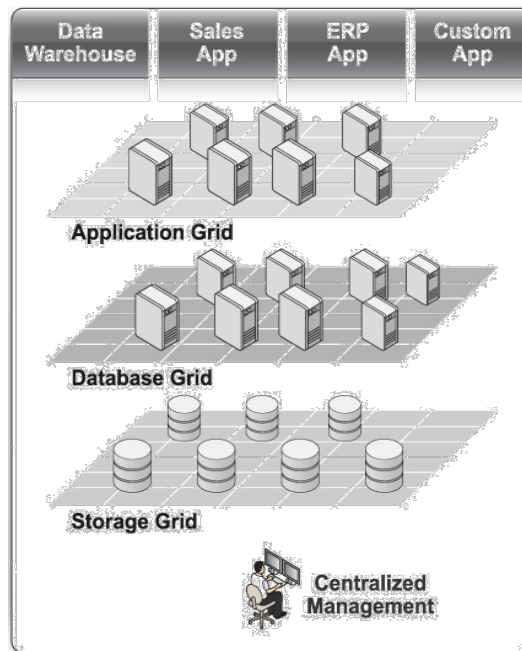
- Sized for Data Center
  - Resource pooling
  - High quality of service
- Meet changing business needs?
  - Elasticity on-demand
  - Rapid self service provisioning
- Easy to manage at lower cost
  - Fewer moving parts





# The Data Center Evolves

## Silos to Clouds





# The Data Center Evolves

## Silos to Clouds

### Dedicated Silos

- Physical
- Dedicated HA clusters
- Sized for peak load
- Expensive to manage

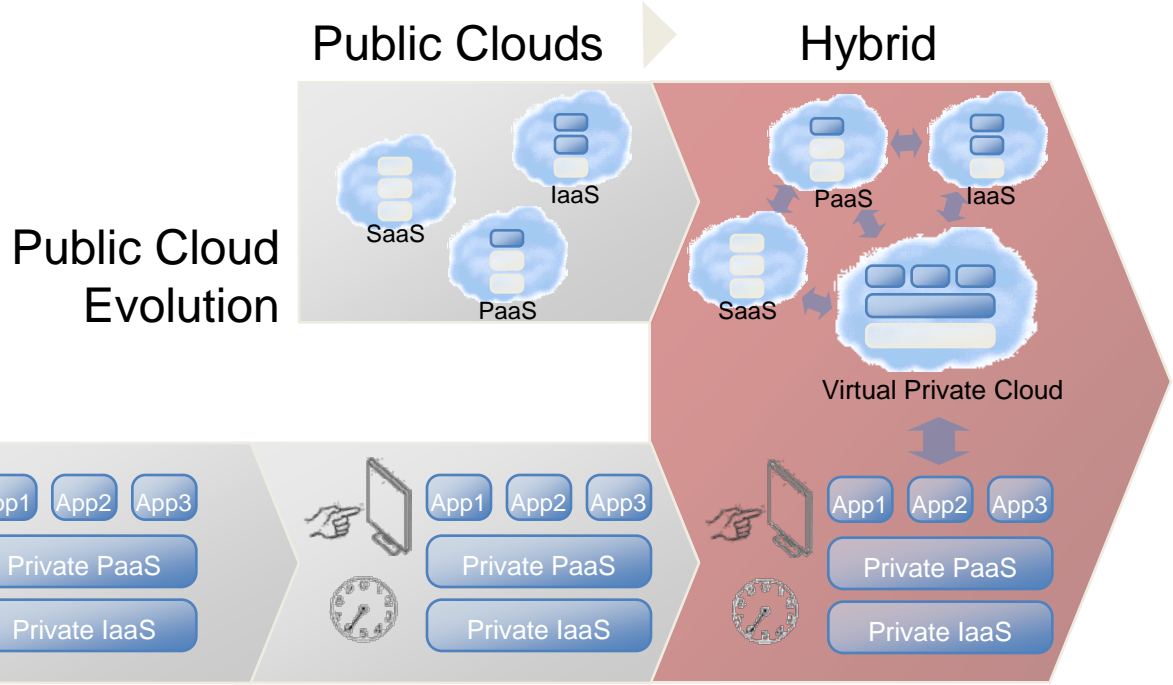
### Grid

- Virtual
- Enhanced flexibility
- Improved utilization
- Efficient management

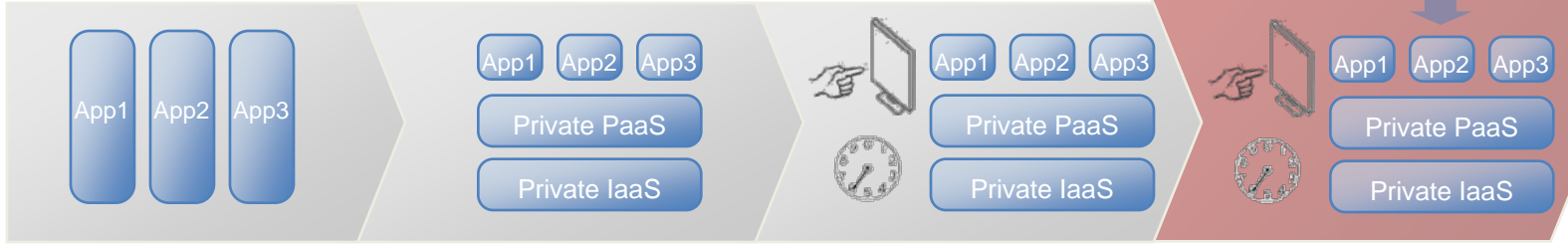
### Cloud

- Consolidated
- Rapidly provisioned
- Elastic
- High QoS

# Enterprise Evolution To Cloud



## Private Cloud Evolution



### Silo'd

- Physical
- Dedicated
- Static
- Heterogeneous

### Grid

- Virtual
- Shared services
- Dynamic
- Standardized appliances

### Private Cloud

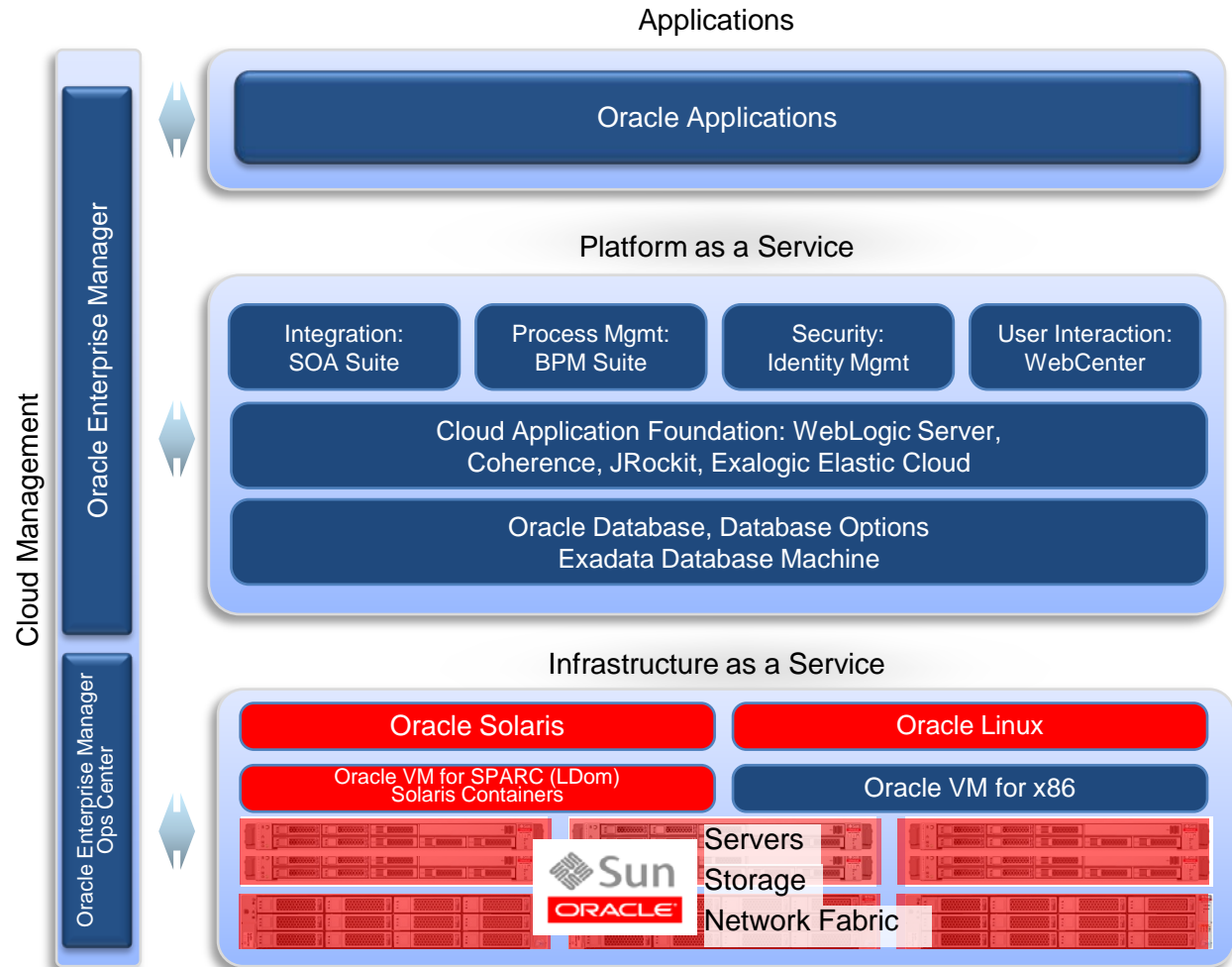
- Self-service
- Policy-based resource mgmt
- Chargeback
- Capacity planning

### Hybrid

- Federation with public clouds
- Interoperability
- Cloud bursting



# Private Cloud Products





# Total Cloud Control

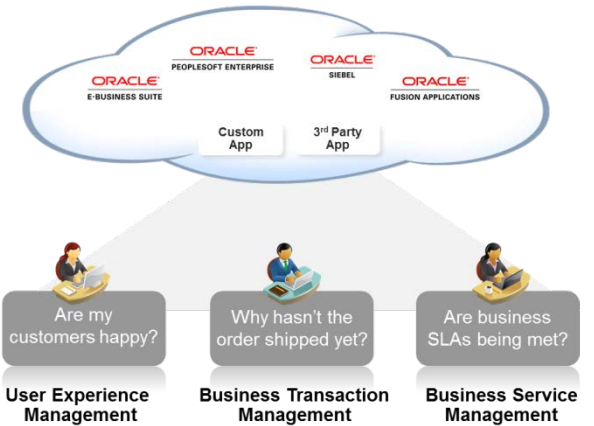
**ORACLE**  
ENTERPRISE MANAGER **12<sup>c</sup>**



**Complete Lifecycle Management**



**Integrated Cloud Stack Management**



**Business-Driven Application Management**

Self-Service IT

Simple and Automated

Business Driven

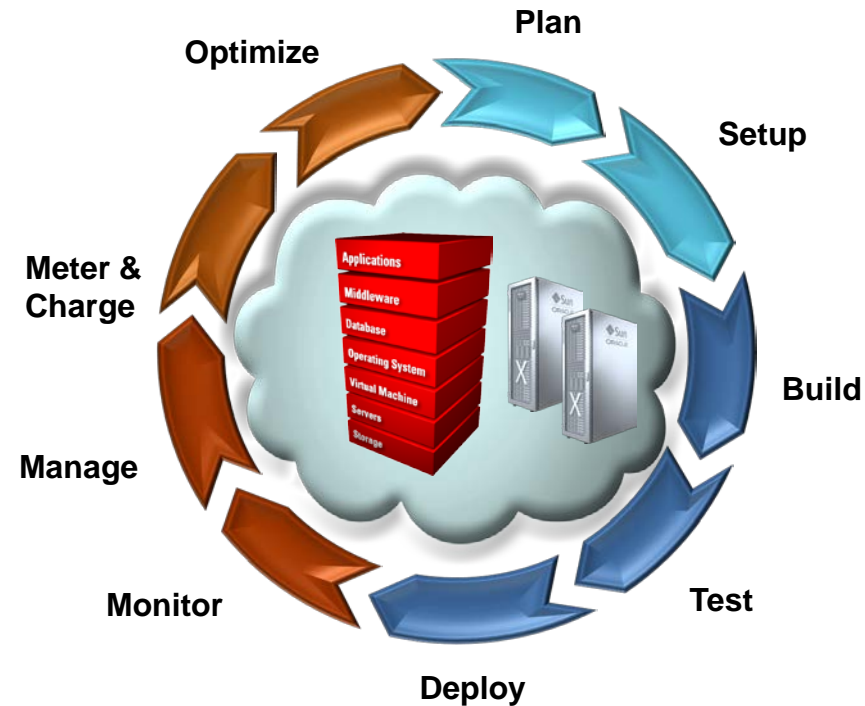


# Oracle Enterprise Manager 12c

## Total Cloud Control

The only complete management solution for Oracle-based clouds

- Consolidation Planner
- Cloud Design and Setup
- Self-Service
- Elastic Workload Management
- Metering and Chargeback



# Running Oracle in Public Clouds



The screenshot shows the Amazon Web Services website with a navigation menu including 'About AWS', 'Products', 'Solutions', 'Resources', 'Support', and 'Your Account'. The main content area is titled 'Oracle and AWS' and features a large 'ORACLE' logo. The text describes how Oracle Database 11g and Oracle Enterprise Linux can be used on AWS to build enterprise-grade solutions. A 'Getting started' sidebar lists steps like signing up for Amazon EC2 and downloading Oracle AMIs. An 'Oracle Cloud Webinar' link is visible at the bottom left.

The screenshot shows the Rackspace Cloud interface. The main content area is titled 'Select an image from one of the tabs below'. There are three tabs: 'Standard Images', 'Enterprise Bundles', and 'My Images'. The 'Enterprise Bundles' tab is selected, showing two bundles:

OS	Image	Server
ORACLE FUSION MIDDLEWARE WEBLOGIC SERVER	Oracle WebLogic Server 11g Bundle configured by Oracle	RAM: 4 GB Disk: 80 GB
ORACLE DATABASE	Oracle Database 11g Bundle configured by Oracle	RAM: 4 GB Disk: 80 GB

The Oracle WebLogic Server bundle includes details: WebLogic Server 11g (10.3.1), jRockit 6.0 (27.6), Oracle Enterprise Linux Server release 5 (Carthage), Kernel 2.6.18-9-ehp, and 32-bit architecture. A link to the 'End User License Agreement' is provided. The Oracle Database bundle includes details: Oracle Database 11g Release 1 (11.1.0.6).

- Oracle Database, Fusion Middleware & Enterprise Manager supported on EC2
- Amazon Machine Images (AMIs)
- Oracle Database Secure Backup to S3

- Self-service Public PaaS based on Oracle VM, Oracle Enterprise Linux, Oracle Database RAC and Oracle WebLogic Server



## CREDIT SUISSE

- Solution:
  - JAP – Java Application Platform
  - DHP – Database Hosting Platform
  - CHP – Compute Hosting Platform
  - Centralized deployment of 200+ apps
  - Oracle:
    - WebLogic Server 10.3
    - Oracle Database 11g
    - Solaris
    - Sun M-Series/T-Series
- Benefits:
  - 35% reduction in operating costs
  - 30% reduction in project costs
  - 44% power consumption avoided in 4 years, while doubling capacity
  - No downtime incidents in 3 years

## CommonwealthBank

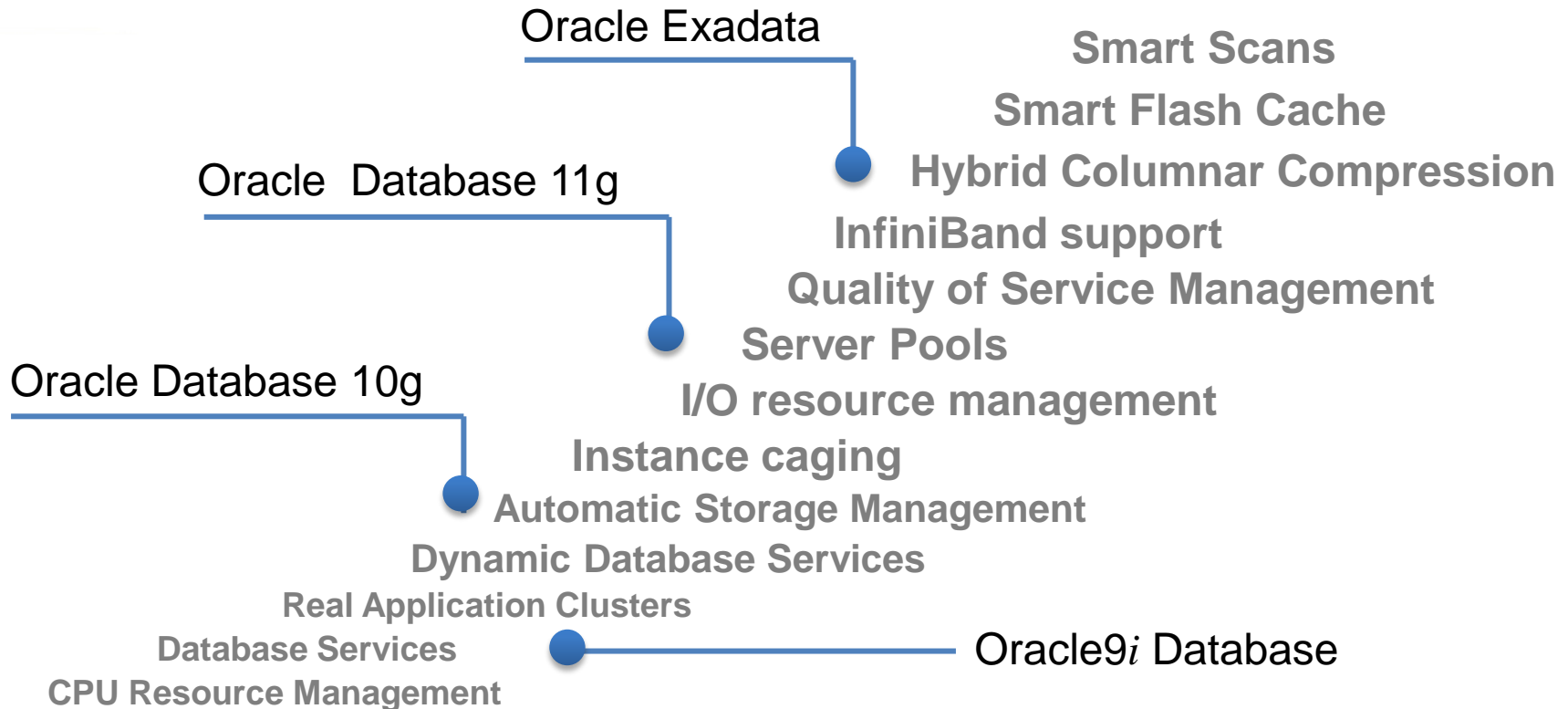


- Solution:
  - “Oracle as a Service” PaaS
  - Consolidate 300 small to medium database environments onto 3 grids
  - Advanced chargeback model for cost recovery
  - Oracle:
    - Oracle Database 11g
    - Exadata
- Benefits:
  - 50% operating cost improvement
  - P&L breakeven in Year 1
  - Server utilization: 15% → 80%
  - Elasticity – CPU can be taken from resource pool as needed



# Enabling the Private Database Cloud

Years of continuous Oracle innovation





# Grid or Cloud What do you think?



# So What's the Difference?

## Key Characteristics of Grid Computing:

- Standardization
- Virtualization
- On-Demand Provisioning
- Automation of Systems Management
- Real-time and Predictive Monitoring

## 5 Essential Characteristics Of Cloud Computing:

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



# ORACLE®