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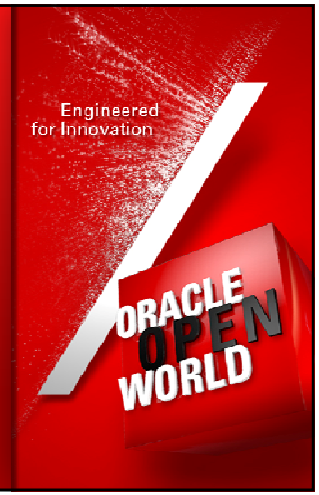
Zero to Cloud *using* *Enterprise Manager 12c*

Ramesh Bhattiprolu
Senior Director
EM Product Management



Session: CON 9585

Title: Zero to Cloud: Real Customers, Real-World Success Stories

Description: The potential benefits of cloud computing are great, but without proper management, the benefits aren't realized. Oracle's integrated enterprise IT management product line helps business get the most from the cloud with the industry's only complete, integrated and business-driven enterprise cloud solution.

In this session, real customers will discuss their real successes as early adopters, revealing how they were able to organize IT resources into a cloud, enable self service provisioning, publish self service applications and meter and manage the cloud. We'll walk you through their best practices and customer experiences in implementing clouds in the real world for greater agility, IT efficiency and reduced costs.

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Zero to Cloud: Compelling Solution

- Customer Requirements
- Oracle Private Cloud Solution Overview
- Key Differentiators

Enterprise Private Cloud

Customer Requirements

- Solutions to define & manage datacenter resources as Services
  - Full set of capabilities covering breadth & depth of an enterprise data center
  - Infrastructure, Database, Platform, Applications…
- Unified & Integrated solution to manage full Cloud life cycle
- Focus on business applications/transactions & data
  - Not just infrastructure
- Seamless connectivity and portability to public cloud services
  - Choice and Continuum of Services

Solution Overview

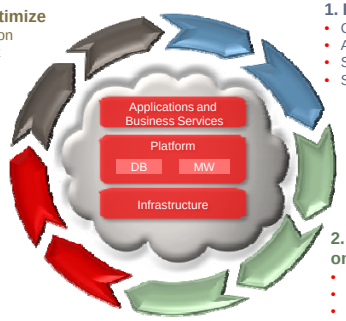
Oracle's Next-Generation Datacenter Strategy

Manage Data Center Resources as Services

- Define Virtualized and Elastic Pools of Compute, Storage, Network Resources
- Enable Virtualized Resources to be Provisioned, Monitored, & Managed
- Enable Oracle Software to be Deployed and Managed on Virtualized Infrastructure
- Enable Hybrid Clouds bridging Private Clouds and Oracle Public Cloud deployments
- Engineered Solutions for out-of-the-box Cloud deployment

Complete Cloud Lifecycle Management

4. Meter, Charge, Optimize
- Meter resource utilization
- Chargeback/Showback
- Optimize performance, capacity, QoS

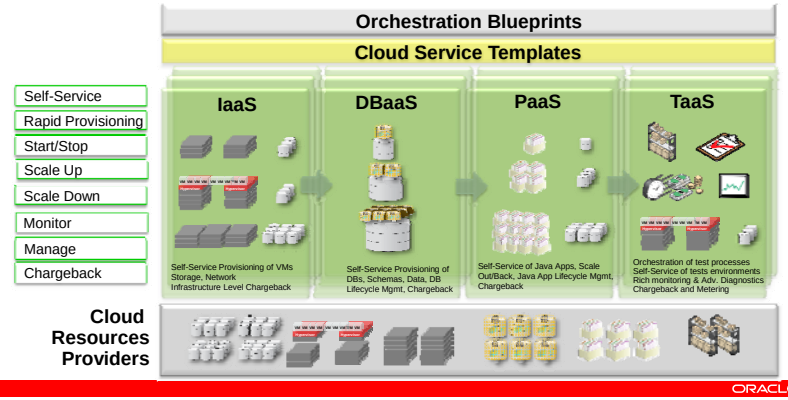


1. Plan & Setup the Cloud
- Capacity & consolidation planning
- Asset discovery
- Setup Resource Pools
- Setup Policies

3. Manage & Monitor the Cloud
- Auto-scaling
- Full stack management
- End-user, business-level, app monitoring

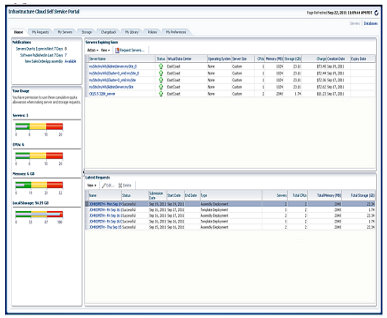
2. Build, Test & Deploy Apps on the Cloud
- Package Apps as Assemblies
- Self-service provisioning
- Test Applications

Comprehensive Solution Footprint



Enterprise Manager 12c Infrastructure Cloud (IaaS, IaaS++)

- Self-Service provisioning and management of VMs, Storage and Network
- Single click provisioning of multi-tier apps via assemblies (IaaS++)
- Policy driven scale up, scale down
- Metering and chargeback
- Guided cloud setup
- Monitoring and management
- RESTful APIs



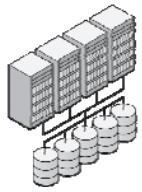
DBaaS Architectures

Using Oracle Database pre-12c

Virtual Machines

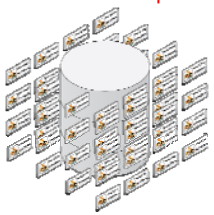
Server Consolidation
Deploy in dedicated VMs
OVM, Solaris

Dedicated Databases



Platform Consolidation
Share server pool
Real Application Clusters

Schema/Workspace

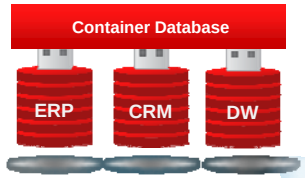


Database Consolidation
Share databases

Increasing Consolidation

Oracle Database 12c Pluggable Databases

New architecture for consolidating databases on Clouds



- No application changes
- Isolation and multitenancy
- Fast provisioning and cloning
- Secure and highly available
- Lower IT costs
- Manage many as one
- Greater resource utilization
- Performant and scalable

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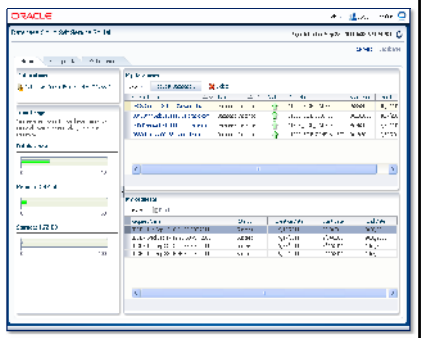
Enterprise Manager 12c DBaaS Cloud

- Self-Service DB, Schema, Provisioning
- Full data cloning by leveraging backups
- Database "SnapClone" feature to create thin-clones
  - Instantaneous snapshotting, ideal for mass scale functional testing
  - Minimal storage consumption
  - Current support for Netapp, ZFS (Hitachi and EMC planned)
- Integrated solution for database lifecycle management: monitoring, backup, patching
- RESTful APIs



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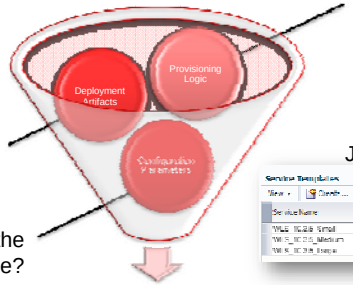
Middleware PaaS

Service Templates

DevOps

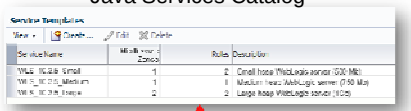
How to deploy a new service instance?



What bits to deploy?

How to tailor the resource instance?

Java Services Catalog



Service Template

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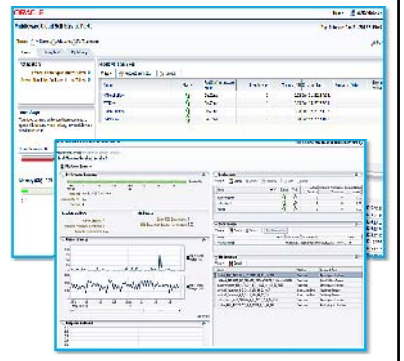
Enterprise Manager 12c MWaaS Cloud

- Self-service deployment of Java apps
  - Underlying runtime/container delivered as a platform
  - Can be deployed on virtual or physical infrastructure
  - Enables developers to focus on building and deploying application logic
- Chargeback based on application usage and configuration
- Self-service application lifecycle
  - Start, stop, monitor, scale-out
- Consistent with Oracle Cloud implementation



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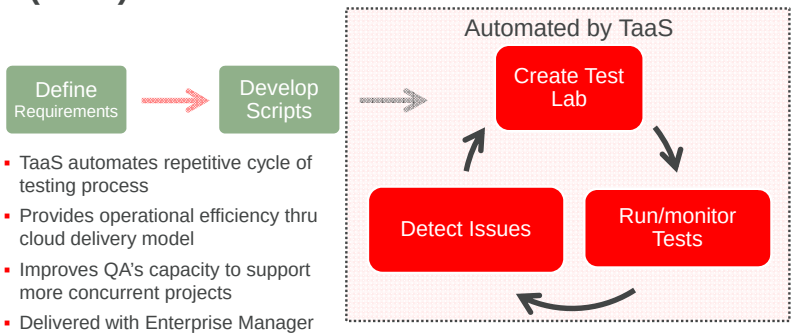
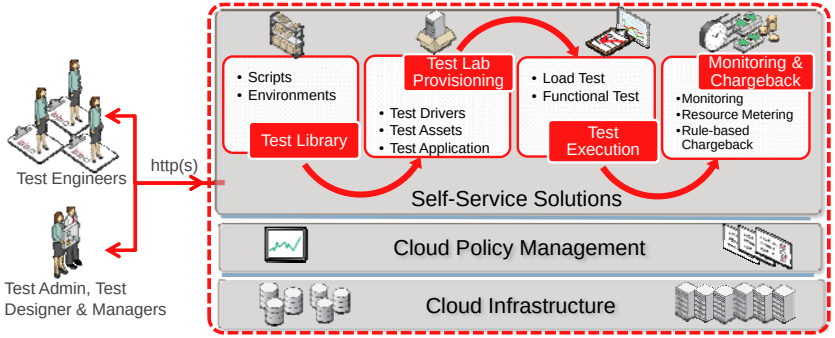
Enterprise Manager 12c Testing-as-a-Service (TaaS)



- TaaS automates repetitive cycle of testing process
- Provides operational efficiency thru cloud delivery model
- Improves QA's capacity to support more concurrent projects
- Delivered with Enterprise Manager 12c, Oracle Application Testing Suite

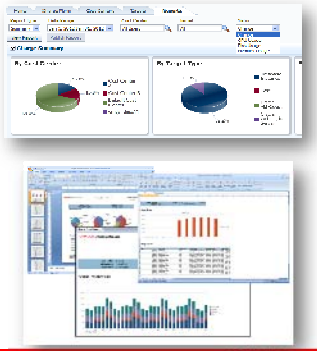
Testing as a Service (TaaS)

Self-service testing cloud



Metering and Chargeback

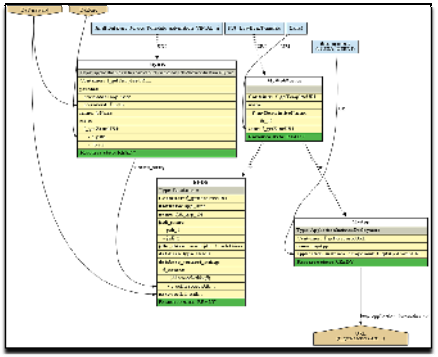
- Flexible metering and chargeback based on:
  - Configuration and monitoring information
  - Host, Database, DB Service, and PDB level
- Automated rollup using LDAP hierarchy
- Out-of-box reporting for business users (via BI Publisher)
- Extend coverage via custom charge items
- APIs for integration with billing systems



Orchestrating it all together

Cloud APIs and Blueprints

- Cloud operations are enabled through RESTful APIs that can be orchestrated through
  - 3rd party orchestrators
  - EM 12c Blueprints
- Blueprints orchestrate multi-layered cloud services to create an application
  - Analogous to AWS CloudFormation
  - Promotes use of proven, standard system topologies/configurations
  - Users get consistency, reproducibility, fewer errors
  - Graphical representation for better usability
  - Released to the community via OTN



Panel Discussion

kt ucloud service

Introducing kt's cloud service

Jung-Sik Suh / kt cloud BU | Sep 2013.

1 kt at a glance

kt is the No.1 All-IP(Smartphone+VoIP, SoIP+Internet+TV+PAD) service provider.

- Established : December 10, 1981
- Revenue : USD 23.7 bil. (2012)[1)]
- No. of Employees : 60,000 above
- Stock Exchange Listings : Korea, New York, London
- Cloud Computing Service : Launched in March 2011

Major Service Subscribers

Mobile	Fixed Broadband	Pay TV[2)]	Fixed phone
18.2 mil. (M/S 60%)	8.0 mil. (M/S 43%)	6.4 mil. (M/S 26%)	16.4 mil. (M/S 30%)

※ Source: kt, Korea Communications Commission)

1) IFRS basis, Exchange rate: USD 1 = KRW 1,000

2) Pay TV: IPTV, Satellite TV, Cable TV

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2 kt's cloud service-ucloud

'ucloud' is the brand name of kt's total cloud service.

The figures of ucloud biz (Sep. 2013)

4,000 users

20,000 VMs deployed

What makes ucloud biz different?

Economy	40% lower price than competitors
Performance	Ranked No.1 on Cloud benchmarking*
Capacity	Global-level SLA
Security	World-best security(IPS/FW)
Agility	provision and release in 5min

Product	Cloud server	Cloud CDN	Cloud storage	Cloud DB	...
Platform	Public Cloud		Private Cloud		...
Multi Data Center, Multi-zone	Cheonan	Mokdong	Gimhae (With Softbank)		

* Source : Cloudharmony.com, November 2011

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3 Case : kt's IPC (Internal Private Cloud)

- We performed cloud migration of In-house server, BIT-ERP, mobile apps and other 176 services.

8,000 VM

Compared to UNIX migration, Cost saved by 69 ~ 76%!

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talk

✓ 176 in-house services on cloud

- 900 physical server
- 600TB storage

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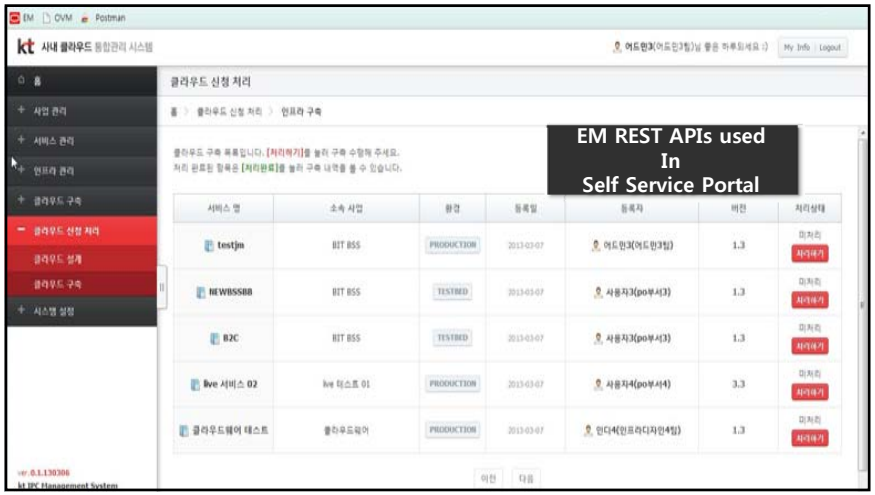
4 The challenges were…

5 Products and Features used

Oracle LINUX	Oracle VM for consolidate infrastructure
Oracle EM12c	Bulk creation of VMs with Oracle Enterprise Linux
Oracle VM for x86	Self Service Provisioning of OEL Assemblies
Oracle Database RAC	Cloud APIs to build a custom self service portal

Competitive edges

- Open source : The standard OS of kt IPC – no separate license fee required
- Management Capabilities of EM12c : Structured to manage the FULL STACK unlike others



6 Benefits

Single solution

- Setting up new VM server and provisioning guest VMs using Assemblies
- Resource monitoring of VM environment & Role based management of VM guest.
- Hot Clone of VM machine and Hot Storage Addition to it.

Best solution

- Oracle Database provisioning, Bare-metal provision of Linux OS
- Linux OS & Oracle Database Management including CLI for offline management tasks.
- Role based management of Linux and Database

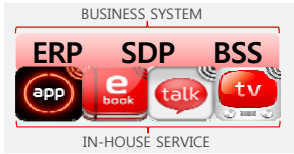
Configuration

- Search and find exact VM guest machine or database instance in IPC.
- Reporting security or configuration violation in various VM or database environments.
- Comparison of configurations with KT's standards to detect deviations

7 Oracle Enterprise Services on the kt Cloud

- Based on Oracle experience in kt's IPC(Internal Public Cloud), kt is now working on a strategic agreement with Oracle to provide the enterprise-class solution

kt's IPC with Oracle Solution (2010~)	Oracle Solution on ucloud biz (2013)



Oracle VM(x86)
Oracle Linux
Oracle EM12c
Oracle DB rack

- ✓ Cost Saving
- ✓ Operational Efficiency
- ✓ Integration
- ✓ Scalability

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Partnership with Oracle –

- ✓ Public, private cloud with enhanced security
- ✓ Competitive service and solutions to customers

Oracle VM Server/Manager/EM DB Cloud

DBMS 12c based Pluggable DB Cloud

Exadata based Consolidation DB Cloud

kt

Thank you | kt

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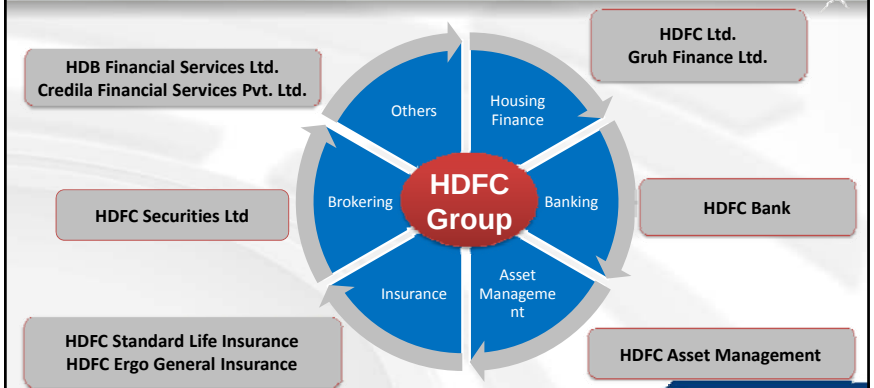
Nilanjay Bhattacharjee
Assistant Vice President IT
Nilanjay.Bhattacharjee@hdfcbank.com

About HDFC Bank



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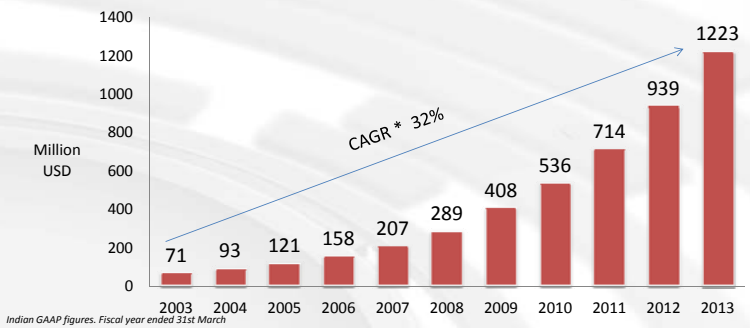

Indian GAAP figures. Fiscal year ended 31st March

•10 year Compounded Annual Growth Rate

• Figures in Million USD

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Agenda

- IT Strategy 2015
- Role of Cloud in HDFC IT
- Consolidation Planning & Execution
- Cloud Initiatives in Bank
  - Database-as-a-Service on Exadata
  - Schema-as-a-Service Implementation
  - Secure Subset Self-Service Provisioning
  - Extending to Middleware and Apps-as-a-Service
- Taking Private Cloud to next level
- Summary/Q&A

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IT Strategy 2015

- Capex & Opex Reduction
- Best in class customer services
- Maximize business opportunities
- Joint targets with business
- Process Improvement

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Why Cloud?

- Exponential growth in data due to compliance requirements - Enterprise Archival System
- Silo'ed IT environment with Average 30% utilization
- Cost of database provisioning high due to request turnaround time and System Integrators Resource Costs
- Configuration Standardization needs
- Time-to-Market requirements for new business initiatives

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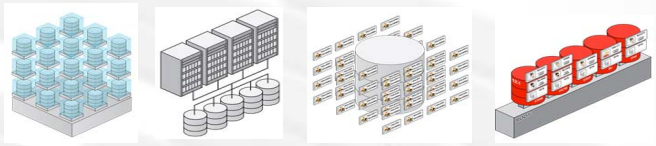
Consolidation Options



	Server consolidation	Database consolidation	Schema consolidation	PDB consolidation
Implementation	Easy	Easy	Difficult	Easy
Application suitability	Some	All	Some	Some
ROI	Low	high	extremely high	highest
Time to market	long	long	short	short
Isolation	highest	high	limited	high
Availability	High	highest	highest	highest
Scalability	limited	excellent	excellent	excellent
Consolidation density	low	high	highest	highest

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Enterprise Archival System using Schema-aaS

Business Challenges

- Long term Data availability requirement to meet regulatory compliance
- Data Availability requirement by forensic and analytics teams
- Read-only databases
- Applications lacking purging policy or budget for separate archival system
- Sunset applications which are on older hardware and version
- Applications where archival system have grown to unmanageable size

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Enterprise Archival System using Schema-aaS

Solution: Schema As A Service

- Self Service Schema Provisioning/Schema-as-a-Service(SCAAS)
- Schema is allocated out of a large database which eliminated need to creating and managing multiple database instances
- Separate Schema ensures isolation and security across multiple schema objects and required isolation
- Utilize Advanced Compression and Exadata/ZFS Hybrid Columnar Compression(HCC) capabilities as core building blocks for Archival Use case in Cloud
- Used for Historical Reporting/Forensic/Archiving purpose

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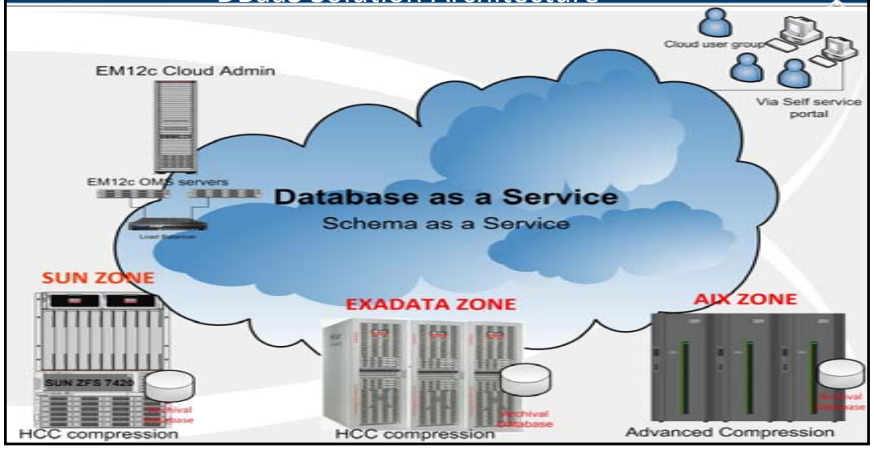
DBaaS Solution Architecture



DBaaS Building blocks

- **Hardware for UAT and Archival system zones**
  - Exadata X2-2 Half rack High capacity
  - Sun X3 -2B with ZFS for HCC on smaller system
  - AIX hardware with storage and Oracle software pre-installed
- **Hardware for OMS and Repository**
  - 2 node OMS server
  - 2 node RAC on Exadata
  - Hardware load balancer for OMS load balancing
- **Software**
  - EM12c (DB Cloud and Lifecycle Management pack)
  - OEL 5.7 for OMS install
  - Other packs for DB management
  - Oracle Advanced Compression
- **Project Planning**
  - Scoping implementation
  - Engaging End Users and Stakeholders early on from Scoping till Go live
  - Oracle SCP/PM team as trusted advisor to Project

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Secure Subset Provisioning

Business Drivers

- UAT databases sometimes cannot be created due to large DB size, security considerations, storage space & time constraints
  - Impacting technical/functional testing
  - Delayed rollout of bug fixes to production
- Existing UAT setups in use for prior testing mandating the setup to remain untouched

Objectives

- Creation of seed database containing sample data
- Reducing the storage footprint
- Ensuring sensitive data masked in test systems
- On demand generation & deployment
- Enable parallel execution of technical / functional UATs

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Secure Subset Provisioning – Case study

- TEST application data subset was successfully created for a month's data. Subset includes master tables and selective data from transaction tables.
- Process was tuned for completion from an initial period of 18 hours to approximately 2 hours.
- Time duration for this process was observed to further reduce by 14 minutes, with the usage of invisible indexes on date parameter fields.
- Subset was released for UAT and the same has been signed off for functionality.

DWMS UAT	Regular Database	Subset Database
Database Size	430 GB	102 GB
Export Dump Size	185 GB	6 GB
Import Time	6 – 8 hrs	30 mins (May very as per subset size)

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Middleware and App-as-a-Service

- EM12c driven MW/App Cloud allows Administrators to:
  - Pool resources
  - Standardize and automate deployment processes
  - Publish established templates to service catalog
  - Setup role-based access and privileges
  - Set quotas to limit over-consumption
  - Establish policies for scale-up and scale-down, and retirement
  - Enable metering and optional chargeback on consumed resources.
- For Consumers
  - Request and Provision Middleware Services
  - Monitor performance of provisioned middleware service
  - Control availability of provisioned WLS through simple push buttons
  - Scale Up / Scale down provisioned middleware instance
  - Deploy/Undeploy/Redeploy Java EE Applications
  - Create Data Sources
  - Monitor deployed J2EE Applications
  - Deletion of middleware service instances that will no longer be used

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Benefits

- New business initiatives are easily launched due to rapid provisioning
- Effective usage of infrastructure leading to better ROI
- Empowered Application teams to provision Apps/DBs/Schemas using Self Service
- Hardware hosting sunset applications phased out of DC reducing power and cooling requirement
- Cut down on Support/SI costs for DBA activities
- 10X compression achieved with Enterprise Archival System in Cloud leading to lower CapEx requirement

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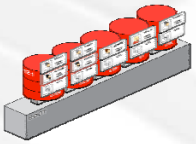
Next Steps

Snap Clone
- Thin Cloning on ZFS, Netapp, Hitachi (once available)
- "Time Travel" Capability enhances Self Service benefits

DB 12c and PDBaaS
- DB 12c Beta Customer and Early Adopter
- Schema v/s PDB Consolidation
- PDB Management and PDBaaS

Enterprise Cloud on SuperCluster
- DBaaS on Exadata
- MWaaS/App-as-a-Service
- SnapClone on SSC
- Cloud Blueprints



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References

- HDFC Bank's Private Cloud Solution
- Banking on a Private Cloud

  "HDFC Bank maximizes Oracle Enterprise Manager 12c to reduce costs and launch new business initiatives. "
- HDFC at OOW '13
  - *Zero to Cloud: Real Customers, Real-World Success Stories [CON9585]*
  - *Oracle Exadata and Oracle Enterprise Manager 12c: Extreme Consolidation in the Cloud [CON2734]*

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Summary

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Key Differentiators

- Most comprehensive solution set
  - Infrastructure, Database, Middleware, Testing, and more to come
  - Delivers great ROI and business value by going far beyond virtualization and infrastructure
- Pioneering, most mature engineered systems
  - Provide the fastest path to cloud transformation
- Complete cloud lifecycle management using a single tool
  - Oracle Enterprise Manager 12c
  - Eliminates complexity, integration needs
- Proven products, validated solution blueprints
  - Based on Oracle (Public) Cloud implementation

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Case Study

Database as a Service

India's second largest Private Bank with nearly 2800 branches, 11,000 ATMs
20 million customers
Employees: 56,000
Revenue: USD 5 Billion

FOCUS ON
Consolidation, Self-Service Provisioning, Lifecycle Management

Challenge:

- Database sprawl over 168 racks of real estate
- Hitting performance ceiling on existing infrastructure
- Rollout of new database services often wait on infrastructure; taking and average time of 3 days

Solution:

- Run new database applications on Exadata while legacy applications run on IBM AIX
- EM 12c based Self-Service Provisioning of databases
- EM 12c Lifecycle Management features for Discovery, Compliance, Patching, etc

BENEFITS

- Reduced new database rollout time from **3 days to 3.5 hours**
- Standardized database offering for Developers and QA reducing any significant configuration drift and compliance challenges

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Case Study

Infrastructure as a Service

Major Telecom player in the Asia Pacific Region since 1981
Revenue: USD 23.7 billion; No of Employees: 60,000
Stock Exchanges: Korea, New York, London

FOCUS ON
Public & Private Cloud, Self-Service Provisioning, Data Center Management

Challenge:

- Management issues with large Virtualization environment
- High costs for handling customer requests
- Need for a single management console for entire Data Center resources

Solution:

- Oracle VM to consolidate infrastructure – 8000 VMs; 900 Physical Servers; 600 TB Storage
- Oracle Enterprise Manager 12c
  - Build, Monitor and Manage Infrastructure Cloud; 176 in-house Services launched on cloud
  - Self Service Provisioning of Assemblies
  - Cloud APIs to build custom self service portal

BENEFITS

- Single Solution to monitor Data Center resources and role based management
- Standardized configuration reducing significant configuration drift and security challenges
- 70% Cost Savings in comparison to Unix migration

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Case Study

Database as a Service

Norwegian Labor and Welfare Administration
Pension services, Sickness/Unemployment benefits
& Occupational rehabilitation for entire Norway population
450 local offices all across Norway - 14.000 Employees
Administers one third of the national budget

FOCUS ON
Consolidation, Standardization, Self-Service and Chargeback

Challenges:

- Lack of consolidation due to heterogenous platforms
- High complexity and disproportionate costs of legacy systems
- Database provisioning average time: 6 – 7 days
- Database Sprawl – Non-standard configurations and licensing needs
- Lack of accountability at department level for resource demand and usage

Solution:

- Consolidate databases on Oracle Exadata and Sun Server X2-8 (8) w/HP 3PAR storage on Oracle Linux
- EM 12c with High Availability Level III
- Self-Service Provisioning of databases with a well-defined service catalog of pre-defined configuration [Small to Large]
- Migrate existing databases into the cloud platform

BENEFITS

- Time to provision databases reduced from 6 days to 18 minutes
- Funding for additional resources is now targeted at the actual divisions/groups consuming them

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