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Managing Clouds with Enterprise Manager 12c:

Overview presentation

Agenda

- Enterprise Manager: Introduction
- Enterprise Cloud: Our Perspective
- Cloud Management: High level features
- Customer and Partner References

Enterprise Manager 12c

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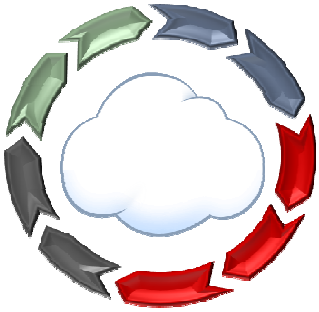

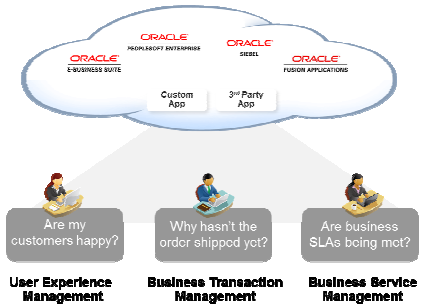

Complete Cloud Lifecycle Management

Integrated Cloud Stack Management

Business-Driven Application Management

Self-Service IT | Simple and Automated | Business Driven

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Enterprise Cloud: What it is, What it is NOT

Enterprise Cloud Is…

- Transformation of IT through consolidation, standardization, and automation
- Covers the breadth and depth of the data centre
  - Physical and virtual systems
  - IaaS, PaaS, applications, business process and activities
- Runs mission critical applications
- Must reduce cost and complexity, deliver better QoS

Enterprise Cloud Is NOT…

- Simple, vanilla IaaS that just allows users to spin VMs on demand
- Has no understanding of application
- Can't run mission critical applications or requires them to be re-coded
- Requires a complex maze of tools and an army of support staff

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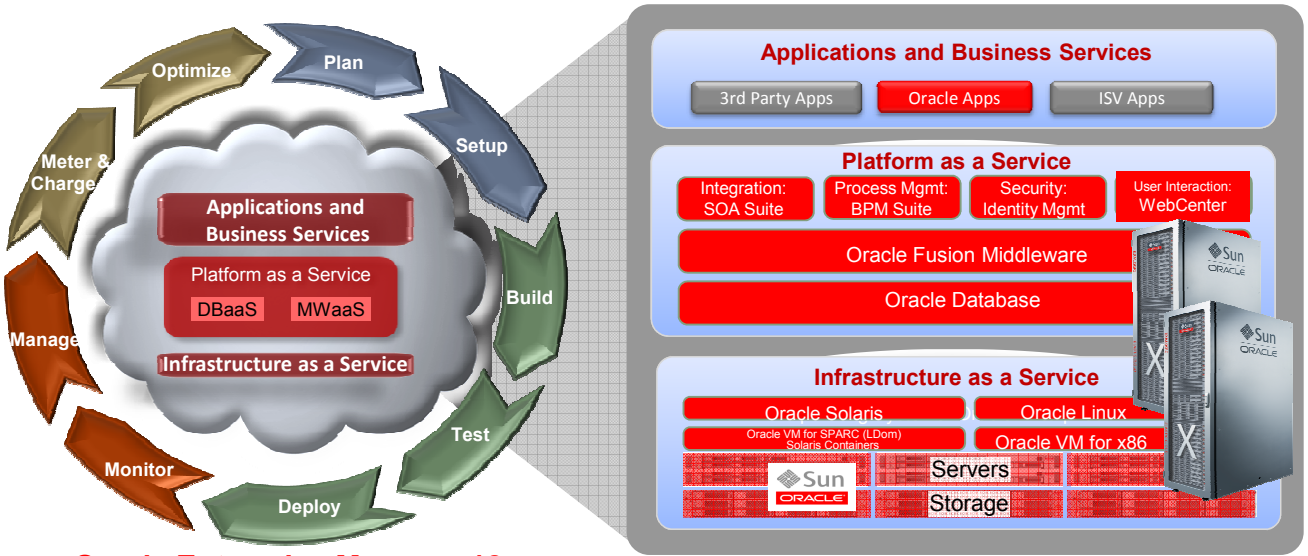
Oracle Enterprise Cloud Platform



Oracle Enterprise Manager 12c

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Complete Cloud Lifecycle Management

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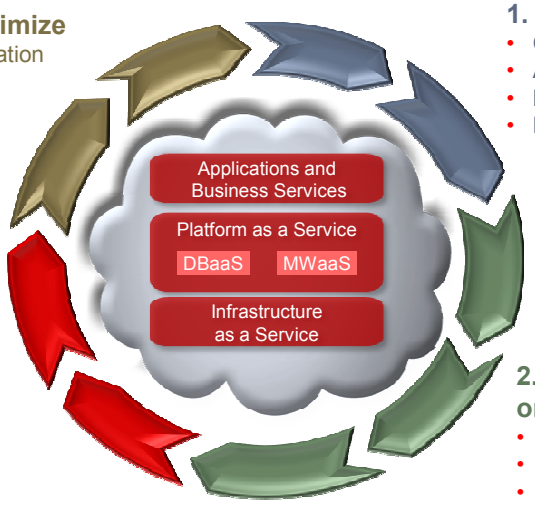
4. Meter, Charge, Optimize
- Metering resource utilization
- Chargeback/Showback
- Optimize performance, capacity, QoS



1. Plan & Setup the Cloud
- Capacity & consolidation planning
- Asset discovery
- Bare-metal provisioning
- Policy setup

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

2. Build, Test & Deploy Apps on the Cloud
- Packaging apps as assemblies
- Testing applications
- Self-service provisioning

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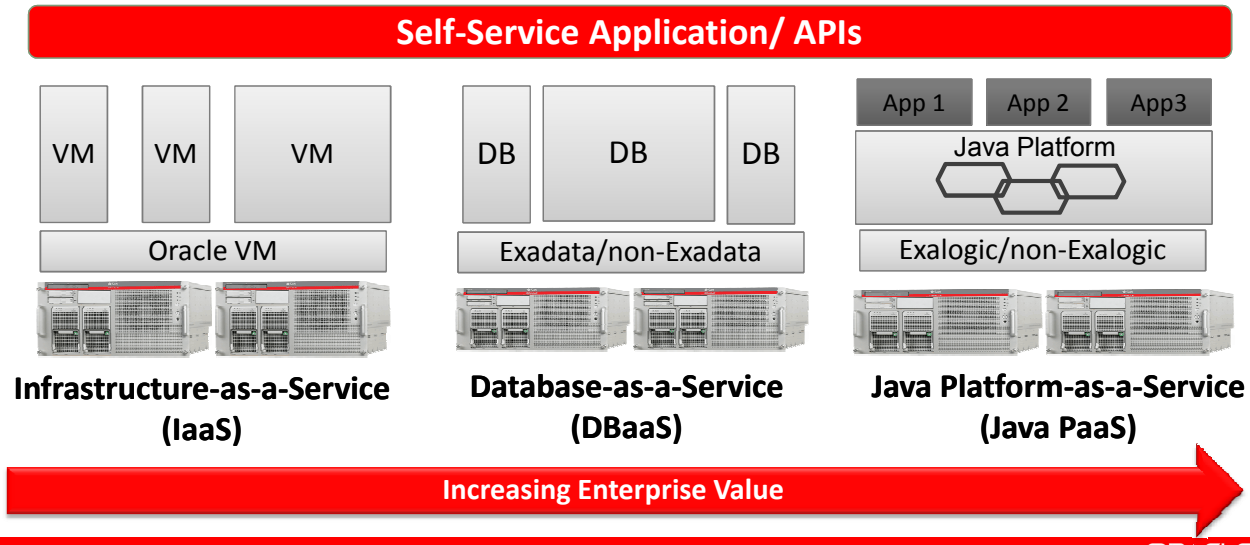
Broadest, Most Complete Range of Enterprise Services



Enterprise Manager 12c: Complete list of Cloud Management Features

Cloud Orchestration Blueprints

IaaS

- Single VM template provisioning for Oracle VM for x86 and Sparc
- Multi-tier app (assembly) provisioning
- Policy driven resource scale out and scale back
- Live migration and power management
- Host and VM level chargeback

DBaaS

- Self-Service provisioning of seed databases
- Integrated database lifecycle management
- Chargeback for database services
- Schema-as-a-Service
- Snap Clone
- Full Clone using RMAN

Java PaaS

- Self-Service provisioning of Java applications
- Application level scale out and scale back
- Java Application lifecycle management
- Chargeback for Java Services

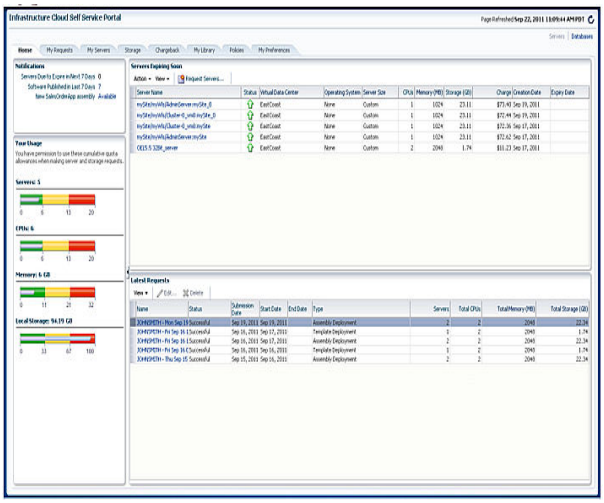
TaaS

- Orchestration of test processes
- Self-service provisioning of test environments
- Rich monitoring and advanced diagnostics
- Chargeback and Metering

EM 12c IaaS

x86, SPARC, Exalogic

- Broad platform support
  - OVM for x86
  - OVM for SPARC, Solaris Containers
  - Exalogic
- Self-Service provisioning and management of VMs, Storage and Network
- Single click provisioning of multi-tier apps via assemblies
- Policy driven Scale up, scale down, Live migration and power management
- RESTful APIs



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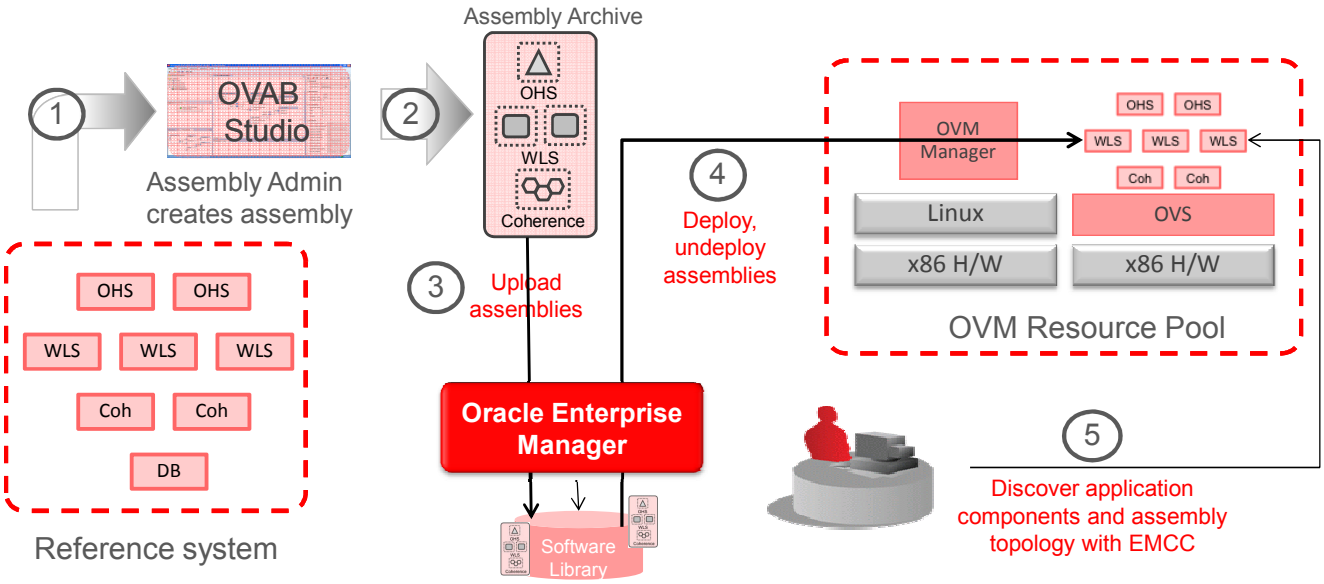
Assembly Deployment via Enterprise Manager



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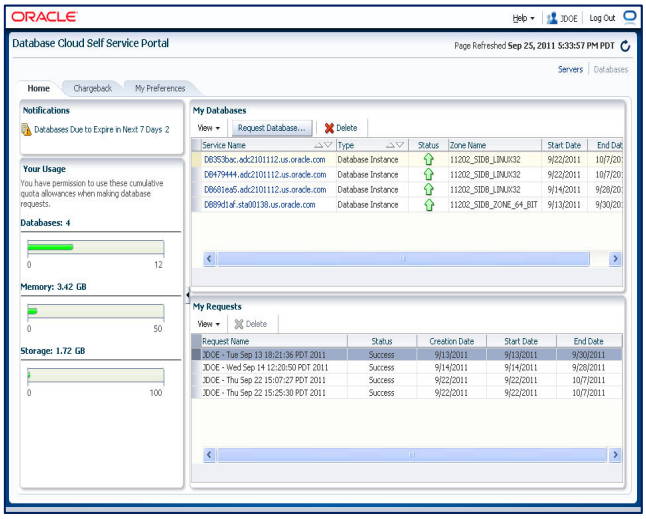
EM 12c DBaaS

- Self-Service DB and Schema Provisioning
- Schema-as-a-Service implementation consistent with Oracle Cloud DB Service
- Database "Snap Clone" feature leveraging underlying storage copy-on-write technologies
  - 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



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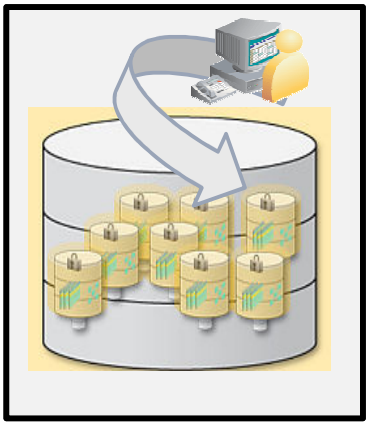
DBaaS: Schema-as-a-Service

- Features
  - Consolidate multiple applications in a shared database
  - Each application user can provision one or more database schema(s)
  - Automated placement based on workload specifications
  - Service governance through quotas, retirement policies and chargeback plans
  - Service level assurance through Database Resource Manager
  - Security isolation through Data Vault
- Benefits
  - Saves resources through ultimate consolidation of multiple database applications
  - Minimizes administrative overheads and compliance challenges
    - Example: Needs a single patching for 255 app schemas in database 11g
  - Increases efficiency from automated provisioning



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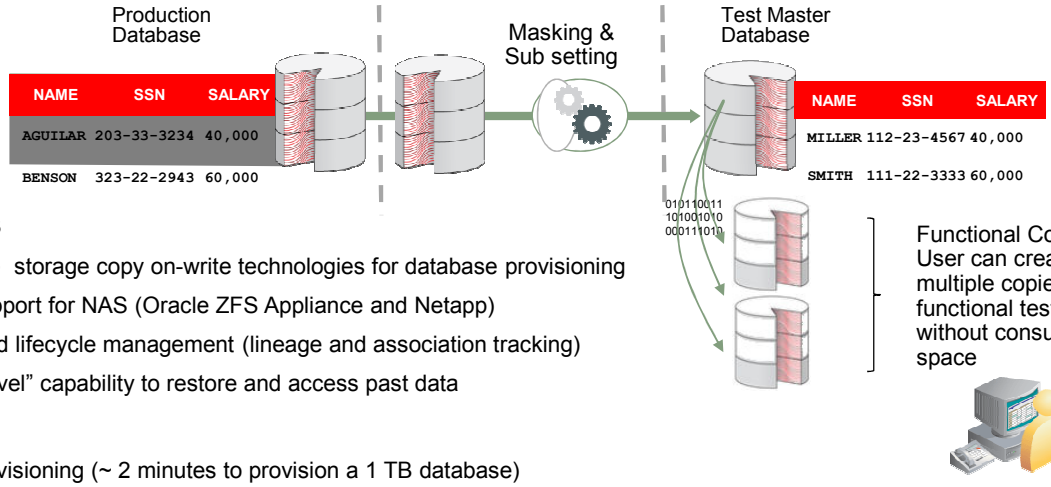
DBaaS "Snap Clone"

Database Provisioning in Minutes



- Features
  - Leverage storage copy on-write technologies for database provisioning
  - Initial support for NAS (Oracle ZFS Appliance and Netapp)
  - Integrated lifecycle management (lineage and association tracking)
  - "Time travel" capability to restore and access past data
- Benefits
  - Agile provisioning (~ 2 minutes to provision a 1 TB database)
  - Over 90% storage savings (100 KB of additional space for cloning a 1 TB database)
  - Reduced administrative overhead from integrated lifecycle management

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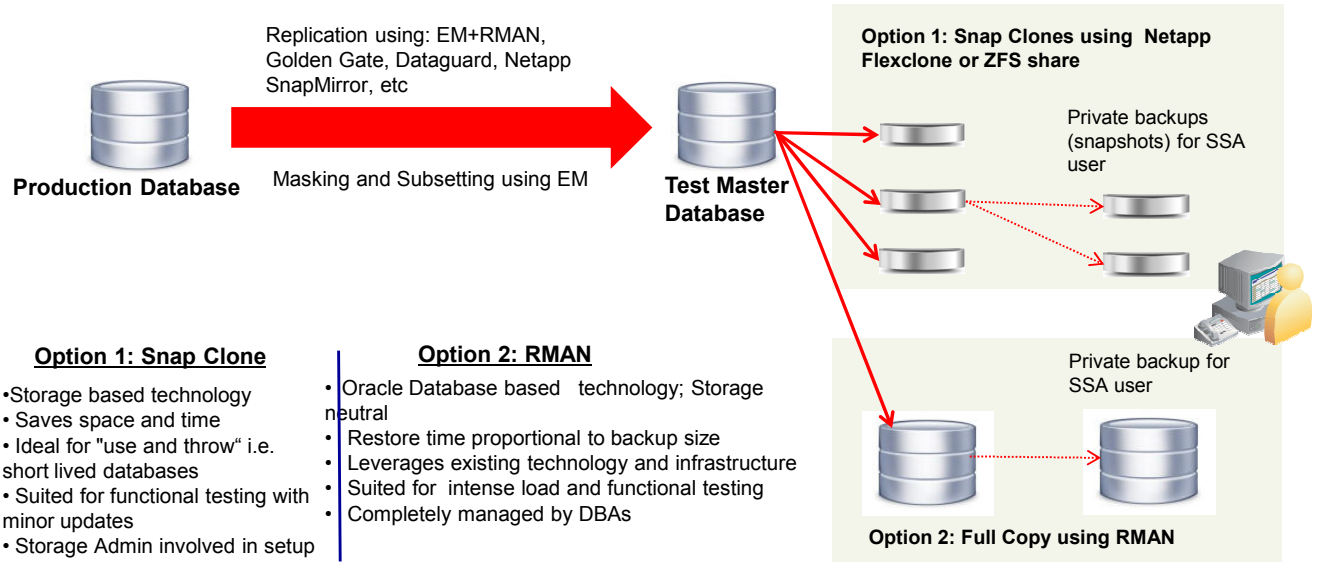
Summary of Database Cloning Choices

From Enterprise Manager



Option 1: Snap Clone

- Storage based technology
- Saves space and time
- Ideal for "use and throw" i.e. short lived databases
- Suited for functional testing with minor updates
- Storage Admin involved in setup

Option 2: RMAN

- Oracle Database based technology; Storage neutral
- Restore time proportional to backup size
- Leverages existing technology and infrastructure
- Suited for intense load and functional testing
- Completely managed by DBAs

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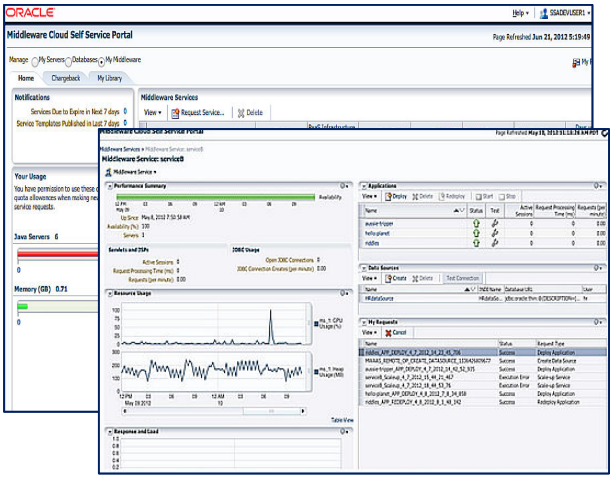
EM 12c MWaaS (Java PaaS)

- Self-service deployment of Java apps
  - Underlying runtime/container delivered as a platform
  - 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
- Integrated User experience and business transaction monitoring
- Consistent with Oracle Cloud implementation



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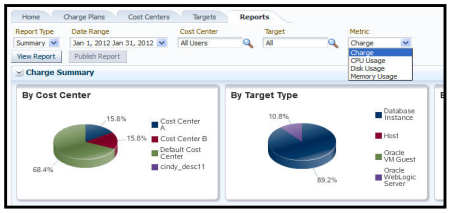
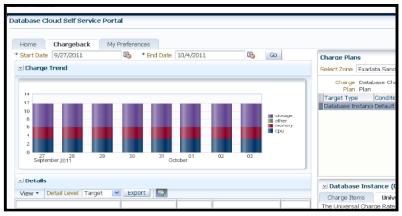
Metering the Cloud Usage



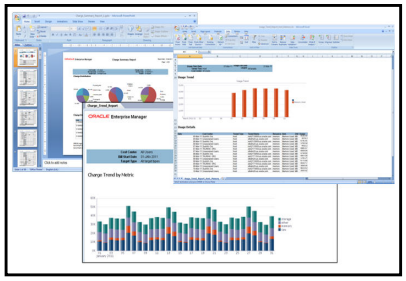
Chargeback Administrator

- Rollup based on LDAP hierarchy
- Summary and Trending reports for Usage and Charge
- Drilldowns



Self-Service Portal User

- Charge Trend reports broken down by resource
- Selectable detail levels
- Charge Plan configuration



Line of Business User

- Integrate with BI Publisher
- Generate Reports in variety of formats
  - Excel, Word, HTML, PowerPoint, PDF
- Email or FTP reports

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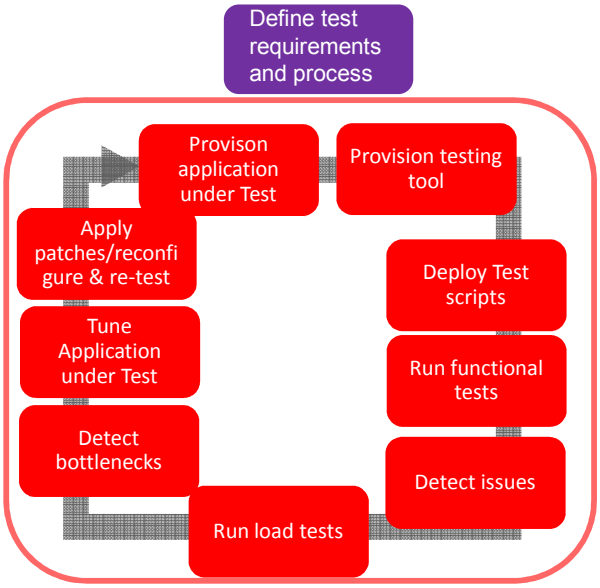
Testing Challenges

Why are changes not being tested?

- Testing is time-consuming, can take weeks
  - Provisioning hardware and applications consume up to 50% of the ”testing” time
- No integrated solution exists that handle the overall testing process
  - Existing solutions are fragmented
  - Creates barriers between IT and QA



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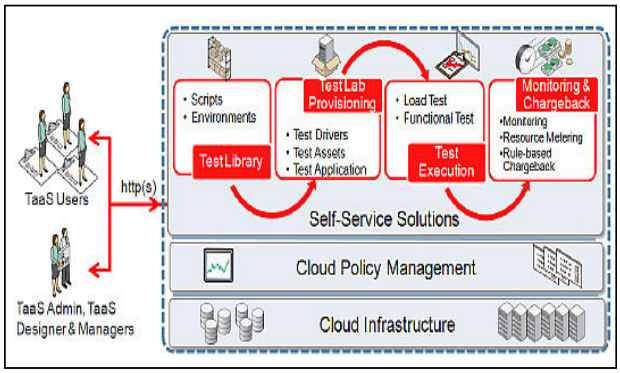
Testing-as-a-Service

- Features
  - Orchestrates testing end-to-end
  - Automates test lab provisioning
    - Applications, test tools and assets (scripts and scenarios)
  - Rich monitoring and advanced diagnostics
  - Advanced chargeback and metering
  - Powerful reporting
  - Deep diagnostics & root cause analysis
- Benefits
  - Reduces overall QA cycle by more than 50%
  - Improves QA efficiency and eliminates multiple point tools



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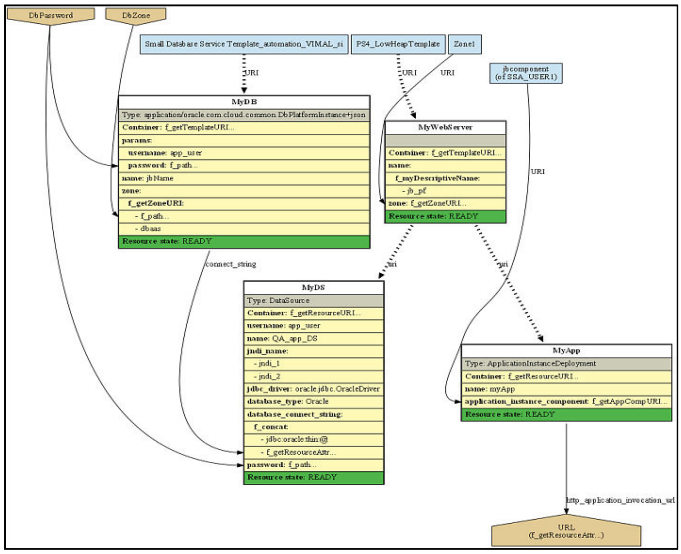
Stitching it all together

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



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Key Chargeback Metrics

	Physical Host	VM	Database	Shared Database (Service)	WebLogic	Shared WebLogic (Application)
Configuration-based	OS CPU Count CPU SPECInt Rate Disk Space Memory Software Installed	Allocated Memory Allocated Storage HA IP Address vCPU Count Size	Edition Memory Usage Option Storage Usage Version	Option Edition	Nodes of Cluster Version	
Usage-based	CPU Time CPU Utilization (%) CPU Utilization (SPECInt) Disk Space Utilization (%) Disk Usage Memory Used Memory Utilization (%) Network IO	CPU Utilization (%) CPU Utilization (SPECInt)	CPU Time CPU Utilization (%) CPU Utilization (SPECInt) Network IO	CPU Time Per Service CPU Utilization Per Service DB Time Per Service Disk Read (Physical) Operations Per Service Disk Write (Physical) Operations Per Service SQL Executes Per Service User Transactions Per Service	User Requests Active Sessions Request Execution Time	User Requests per Application Active Sessions per Application Request Execution Time per Application

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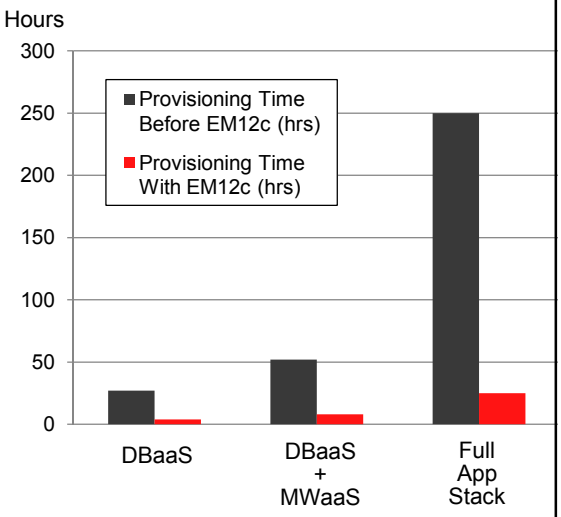
References: Deploy Application Services 10X Faster

Multi-Customer Study By Crimson Consulting

> **"With Oracle Enterprise Manager 12c we cut the time required to provision our RAC systems in half."**
> Oracle DBA, telecommunications firm

> **"Standardized builds based on Enterprise Manager templates are a massive plus…you get fewer errors, lower downtime, fewer infrastructure issues, and faster application development."**
> Oracle DBA, broadcast and telecommunications firm

> **"I can give a set of business resources to a business segment and they can be responsible for the capacity that they stand up."**
> Infrastructure team manager, computer tech firm



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Lawrence Livermore National Labs

World-class Facility for Scientific Innovation

Lawrence Livermore National Laboratory
Science in the National Interest

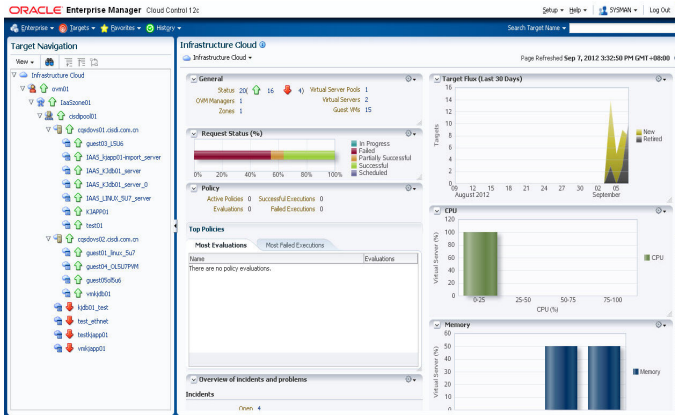
Infrastructure-As-A-Service

Challenges

- Sub-optimal application silos
- Delayed fulfillment of platform requests
- Poor end-to-end visibility, many point tools

Solution

- IaaS using EM 12c and OVM
- Rapid BPEL-based MW platform deployments
- Simplified cloud operations



Standardized Rollouts – Faster Delivery – Pro-active Management

HDFC Bank

India's Leading Bank

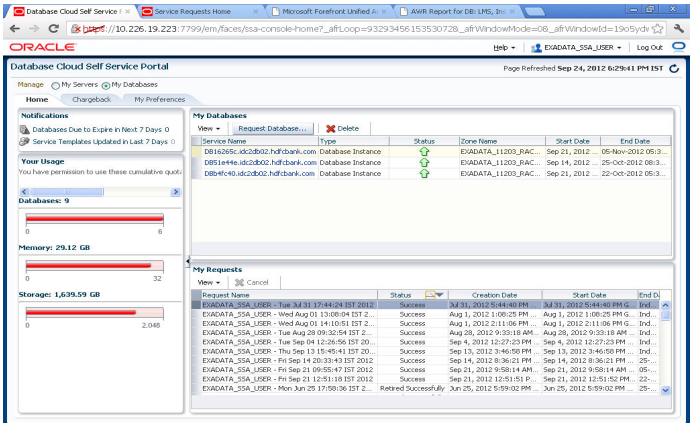
Database-As-A-Service

Challenges

- Sprawl of non-standard databases
- Delayed rollout of new services
- Sub-optimal hardware for variable loads

Solution

- DBaaS using EM 12c and Exadata
- Single click provisioning in minutes



10X Fast App Rollout – Rapid Consolidation – Easier Management

Large Healthcare Company

Provider of Medical Technologies in Over 100 Countries

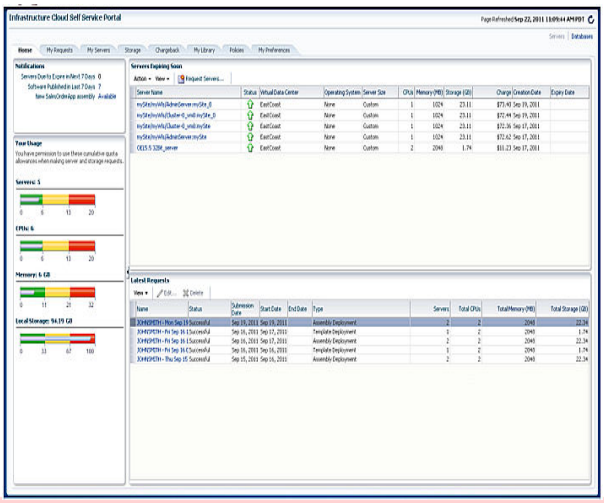
Application Platform-As-A-Service

Challenges

- Complex Dev/Test environment setup
- Very long release cycles (2+ months)
- High CapEx, lack of usage accountability

Solution

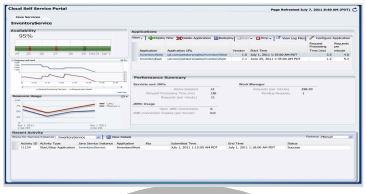
- Siebel running on virtualized shared env
- Self-Service provisioning
- Metering and chargeback



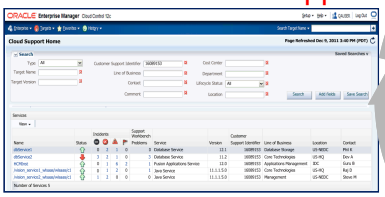
100+ times Faster to Deploy – Usage Accountability – Better Compliance

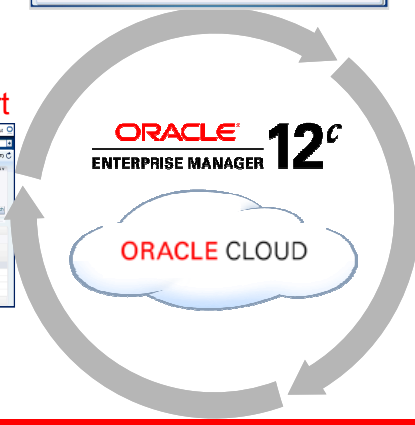
EM 12c: The Nerve Center of Oracle Cloud

Deliver

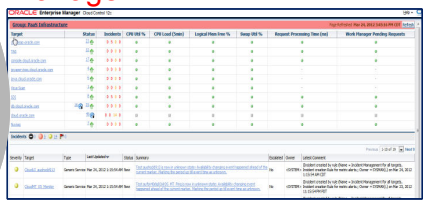


Support





Manage



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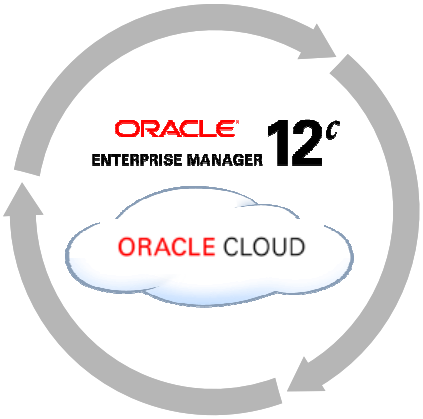
Meeting The Management Needs of A Truly Enterprise Scale Cloud

- 5,622 concurrent self-service users
- 31,518 tenants, 25 million users
- 506,947 service instances
- 598,810 targets
- 9,243 automation jobs per day
- 125,983,703 page views per day

(As of Fall, 2012)



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Summary of Key Differentiators

- The only unified cloud management solution for infrastructure, database, platform and applications
- The most complete and enterprise ready DBaaS solution
- Industry's first private cloud Testing-as-a-Service (TaaS) solution
- The most comprehensive Cloud Lifecycle Management solution - all the way from initial provisioning to sunsetting

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Hardware and Software

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Engineered to Work Together