Virtualizing the Application Grid to Enable Cloud Computing
Evolution of Public and Private Cloud

**Private Cloud Evolution**
- **Silo’d**
  - Physical
  - Static
  - Heterogeneous
- **Grid**
  - Virtual
  - Shared
  - Dynamic
  - Standardized
- **Private Cloud**
  - Elastic
  - Self-Service
  - Chargeback
- **Hybrid**
  - Federation
  - Interoperability
  - Cloud Bursting

**Public Cloud Evolution**
- **IT Outsourcing/Offshoring**
- **Virtual Private Cloud**
  - **SaaS**
  - **IaaS**
  - **PaaS**

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**Applications**
- App1
- App2
- App3
Oracle Cloud Computing Strategy

Our objectives:

- Ensure that cloud computing is fully enterprise grade
- Support both public and private cloud computing – give customers choice

Offer Applications deployed in private shared services environment or via public SaaS

Offer Technology to build private clouds or run in public clouds
Customer Requirements as Part of Virtualization Adoption

Operational Efficiency
- Simplified Self-Service Access
- Programmatic Configuration

Deployment Efficiency
- Standardized Building Blocks
- Automated Provisioning

Runtime Efficiency
- Improved Performance
- Lower Cost
Oracle VM
Evolving Data Center Needs & Virtualization
Requirements Now Beyond “Just” Consolidation

• Virtualization for server consolidation is no longer sufficient
  – Saves capital expenses, but does not adequately reduce operational
cost and complexity
  – Insufficient application insight to ensure service levels are met
  – Does not “package” / reuse full stack knowledge
  – Large, manual customization effort remains up the stack

• Users are now looking for a “cloud” experience from IT:
  – Rapid service (not just OS) provisioning…

• Objective: “Start browser, start using requested software”

• Now: Virtualization’s capabilities need to be integrated to facilitate
deployment and management of complete stacks
Why the Virtualization Choice Matters:
It’s Increasingly About Application Knowledge

• The goal is not “virtualization” itself
• The goal is to make deployment of complete environments faster, easier, and more efficient
  – Increasing the efficiency of the business for end-users
• Virtualization must enable the entire stack to be..
  – Easier to DEPLOY
  – Easier to MANAGE
  – Easier to SUPPORT
• Doing this well means VMs can no longer be “black-boxes” to the virtualization and management
  – Integration of application awareness becoming critical
Oracle VM Manager
Virtualization Management: Included

- **Oracle VM Manager**
  - Centralized, web browser-based console
  - Advanced virtualization management for x86/x64 environments including
    - VM Live Migration
    - HA / auto-restart
    - Load balancing…
  - Available stand-alone or as an integrated Enterprise Manager Pack

- **Oracle VM Server**
  - Installs on “bare-metal” servers in about a minute
  - Supports Linux, Windows and Solaris virtual machines
Oracle VM: Concepts Overview

Server Pools:
- Pool resources
- Load balance
- Live Migrate
- Auto failover

Oracle VM Servers:
- Host guest VMs
- Enterprise Linux
- Windows
- Solaris

Oracle VM Manager:
- Browser-based
- Java server
- Scalable & Available

Shared Storage Pool Options:
- NAS/NFS
- SAN
- iSCSI

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Oracle: Application Aware Virtualization

Full Stack Data Center Virtualization

- Most comprehensive
- Fully tested with applications
- Designed for full stack deployments
- Integrated, full stack management
- Integrated support

Taking you beyond consolidation…

Oracle provides a more COMPLETE solution
Oracle Virtual Assembly Builder
Some Target Use Cases for Virtualized Deployment

• Development Farm
  – Developers require access to their own environment
    • E.g. SOA Suite, Service Bus, DB
    – Setup requires corporate standard configuration
    – Repeatedly configure dozens such environments into VMs

• Shared Services Environment
  – Application teams require custom platform environments
    • WebLogic Server, BPM, SOA Suite, etc.
  – IT prescribes corporate std. components and configurations
  – Deployment topology scaled to different sizes (S – M – L) as collection of VMs
Typical Deployment Topology for Oracle SOA Suite

Web Tier

Application Tier

Data Tier

2 nodes

8 nodes

2 nodes

12 nodes
Challenges in Configuring and Deploying New Application into Virtualized Environment

1 to 3 weeks

Provision virtualized resources
Install & configure OS and all platform software
Create / customize scripts to “automate” process
Use scripts or manually configure all software components to create platform environment
Integrate and test complete end-to-end platform environment
Deploy application

1-5 days  1-2 days  1-5 days  .5 day  1-2 days  .5 day
Slash Total Configuration and Deployment Time
Separate One Time Actions from Repeated Actions

One Time Effort

• Standardize
  • Create self-contained software appliances
  • Eliminate customized one-offs and configuration errors

• Templatize
  • Create configurable blueprints for entire application topology
  • Simplify repeatable process for predictable outcomes

Repeated Activity

• Automate
  • Orchestrated deployment and configuration of all components
  • Reduce manual oversight and expert administration
Transform Complex Multi-Tier Applications into Templatized Building Blocks

Reference System

Web Tier
- Web
- Web

Application Tier
- SOA Svc
- WLS
- WLS

Database Tier
- RAC
- RAC

Virtualized Software Appliances
- Web Appliance
- Application Server Appliance
- Database Appliance

Assembly

Metadata
Oracle Virtual Assembly Builder
Package Multi-Tier Applications

Oracle SOA Suite  |  Oracle BPM Suite  |  Oracle WebCenter  |  Oracle Identity Mgt
Oracle Application Grid
Oracle Database Grid

Introspection & Assembly

Oracle Enterprise Manager

Assembly Builder

Deployment

Oracle VM Server

Application A

Virtualized Software Appliances
Assembly A

Application B

Assembly B
STANDARDIZE: Appliances

- Application-aware P2V
- Self-contained virtual disk images with all s/w to run single instance of a single component
- Customize base OS distrib.
- Component configuration and libraries from reference system captured during introspection
- Configurable properties set at deployment time
- Automatically packaged for target virtual platform
TEMPLOTIZE: Assemblies

- Blueprint describing complete multi-tier application topology
- Collection of all interrelated appliances
- Start-order dependencies
- Allow connection to external resources from appliances (e.g. DB, LDAP server, mail server, web services endpoints, etc.)
- Customize deployment properties for all appliances using Deployment Plan
- Treated as a single deployment unit
# TEMPLATIZE: Deployment Plans

<table>
<thead>
<tr>
<th>Appliances</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Scaling</td>
<td></td>
</tr>
<tr>
<td>• Min, Max, Initial</td>
<td></td>
</tr>
<tr>
<td>• VM Properties</td>
<td></td>
</tr>
<tr>
<td>• CPU, Memory</td>
<td></td>
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<tr>
<td>• Component Properties</td>
<td></td>
</tr>
<tr>
<td>• JDBC, etc.</td>
<td></td>
</tr>
<tr>
<td>• Networking Properties</td>
<td></td>
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<tr>
<td>• IP address</td>
<td></td>
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<tr>
<td>• User Properties</td>
<td></td>
</tr>
<tr>
<td>• Login, Passwords</td>
<td></td>
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</tbody>
</table>

- Overrides for configurable properties for all appliances
- Multiple deployment plans for same assembly
- Use CLI commands to script assembly deployment with different deployment plans
AUTOMATE: Orchestrated Deployment

- Deploy and configure collection all VM instances within assembly with single command
  - Start specified number of instances for all appliances
  - Establish defined relationships between appliances
- VM lifecycle
  - Stage → Prepare → Start
- Software lifecycle within each VM
  - Use properties from Deployment Plan
  - Start OS → Configure OS → Configure networking
  - Start component → Configure component
  - Apply properties picked up from other appliances
  - Listen for component-specific “ready metric”
Oracle Virtual Assembly Builder Studio

Assemblies, Appliances, Catalog

Deployment Resource Pools

Properties Inspector

Assembly Editor
Summary

• Server virtualization provides flexibility and resource efficiency… but it’s not enough

• Improve operations efficiency by creating standardized building blocks for application components

• Create a repeatable process for configuring and deploying complete application infrastructure

• Automate the process