

# VMware vSphere: The Best Place to Run Oracle

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# Agenda

## **Introduction**

Oracle Databases on VMware Overview

Oracle Databases on VMware Key Benefits

Customer Success Stories

Summary

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Introduction

**Oracle Databases on VMware Overview**

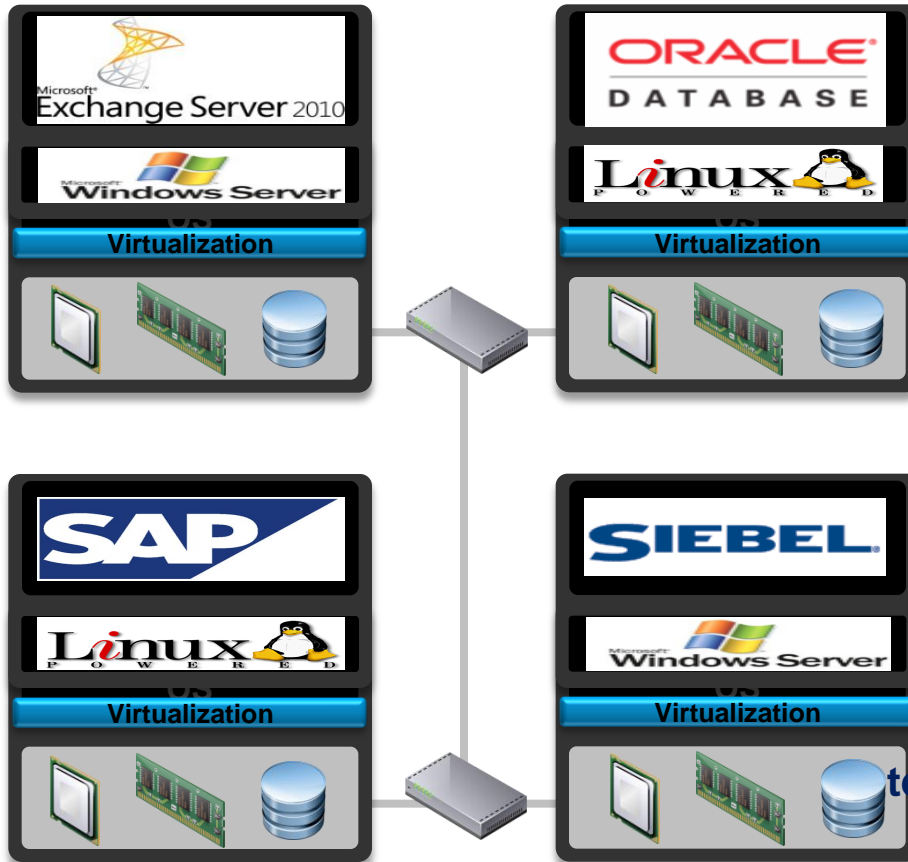
Oracle Databases on VMware Key Benefits

Customer Success Stories

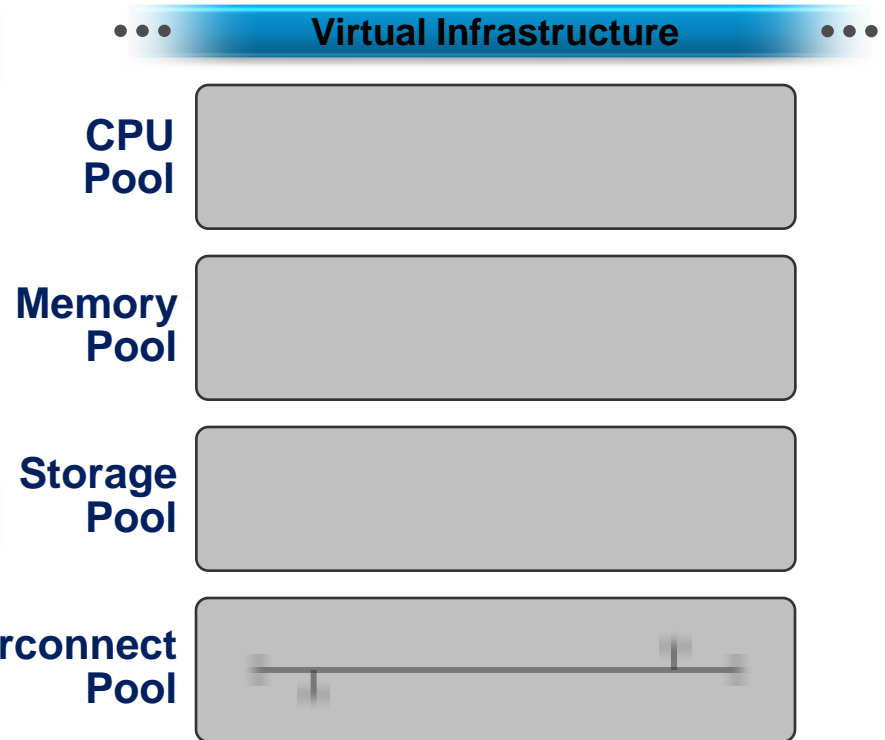
Summary

# Abstraction + Pooling = Reduced Complexity

## Traditional View



## Virtual Infrastructure



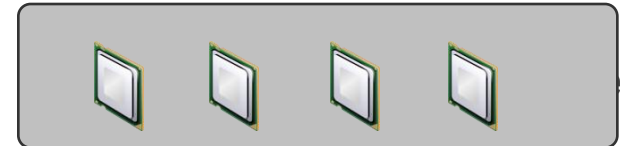
# Abstraction + Pooling = Reduced Complexity



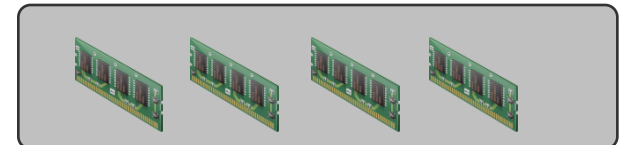
Virtual Infrastructure



CPU Pool



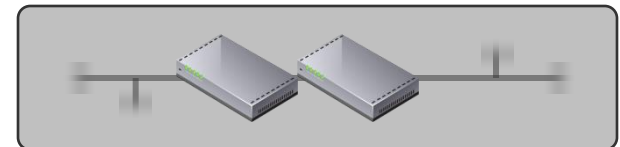
Memory Pool



Storage Pool



Interconnect Pool



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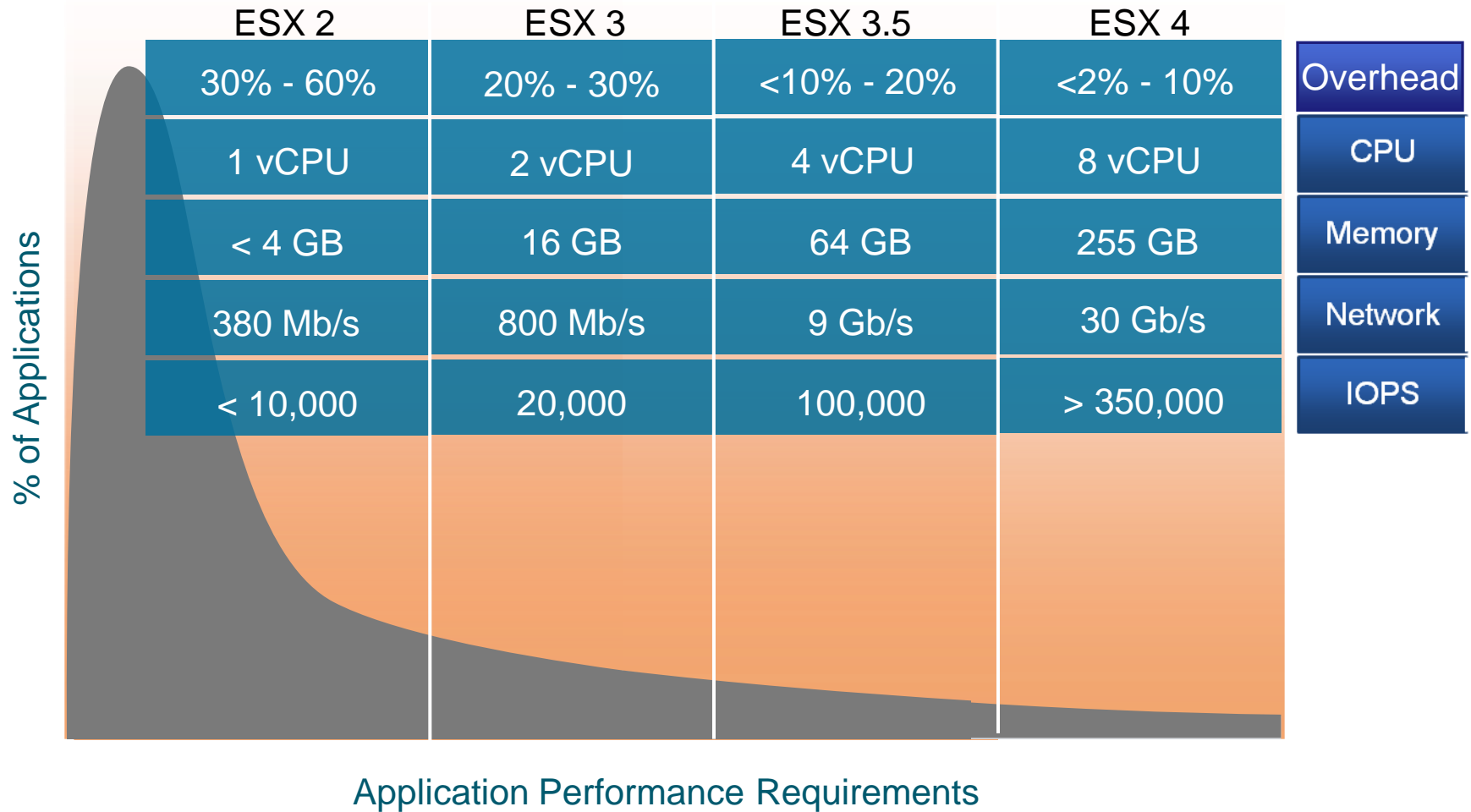
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# >95% of Apps Match Native Performance On Virtual Machines



# Oracle Support on VMware

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## Yes! Oracle has a support statement for VMware

- Oracle MyOracleSupport (Metalink) 249212.1 defines Oracle's VMware support policy most-broadly
- Support facts:
  - Oracle RAC “expressly not supported” – but it is allowed!
  - Oracle will accept SRs on VMware for bugs already known to Oracle
  - Oracle *may* accept SRs on VMware for bugs that are not seen by Oracle as being caused by virtualization
  - Oracle maintains (as do most ISVs) right to require physical reproduction if they suspect VMware is “at fault”
- VMware's Technology partner EMC and System Integrator House of Brick has their support for Oracle on VMware:
  - <http://www.emc.com/solutions/application-environment/oracle/oracle-virtualization-vmware.htm>
  - [www.houseofbrick.com/oracle-on-vmware](http://www.houseofbrick.com/oracle-on-vmware)

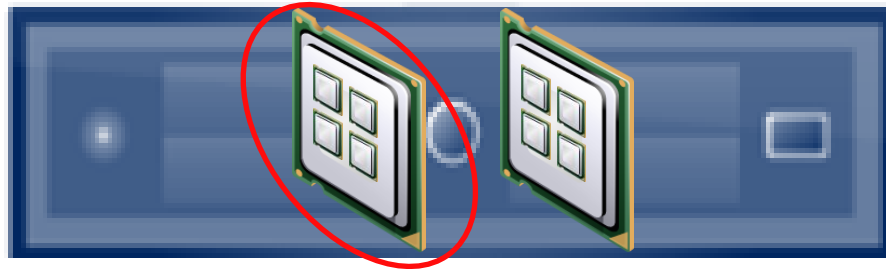
# Oracle Licensing: CPU-Based SKU Considerations

For all of the below situations: License FULL machine

Once “fully licensed” you can deploy unlimited VMs!

## STANDARD EDITION ONE

- Licensed by SOCKET
- Limited to TWO SOCKETS
- Must license FULL machine

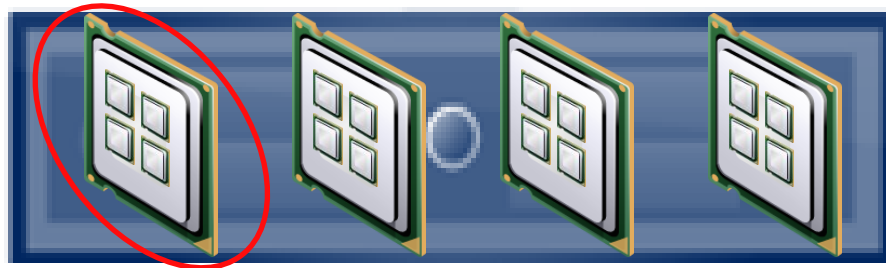


$$\$5,800 \times 2 =$$

**\$11,600**

## STANDARD EDITION

- Licensed by SOCKET
- Limited to FOUR SOCKETS
- Must license FULL machine(s)



$$\$17,500 \times 4 =$$

**\$70,000**

## ENTERPRISE EDITION

- Licensed by CORE
- Apply x86 factor of 0.5 to cores
- Must license FULL machine



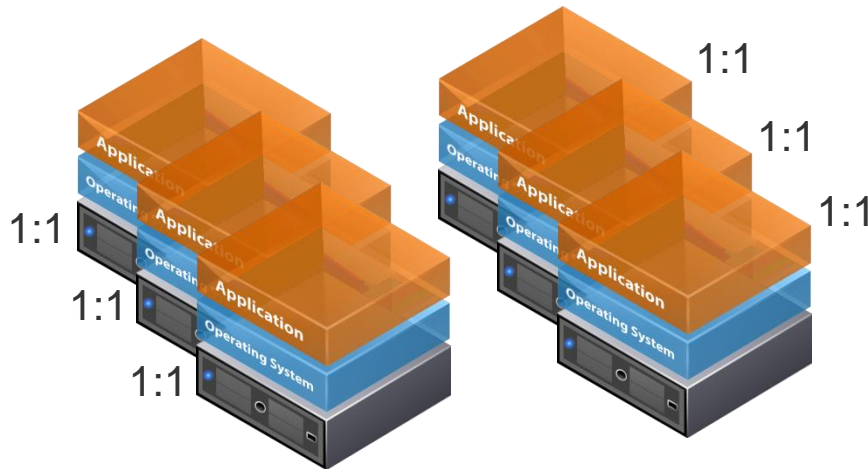
$$\$47,500 \times 16 \times 0.5 =$$

**\$380,000**

Pricing per Oracle Technology Global Price List, January 29, 2009

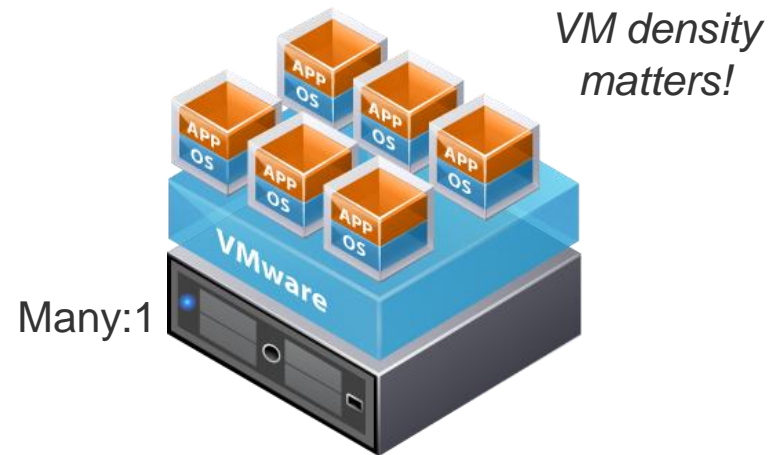
# VM Density is Critical in Virtual Environment

## Physical World



- **1:1 relationship** between applications and hardware
- Relevant cost metric = **cost per server**

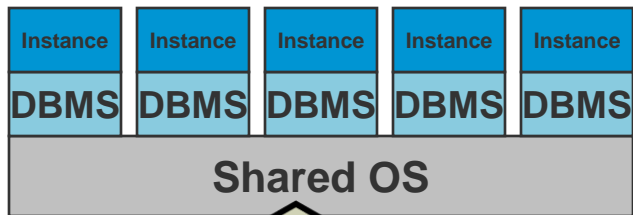
## Virtual World



- **Many:1** relationship between applications and hardware
- Relevant cost metric = **COST PER APPLICATION**

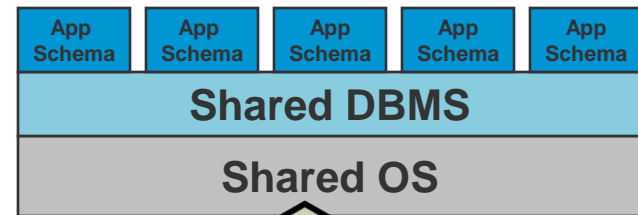
# Conventional DB Consolidation is Difficult

## Multi-Instancing



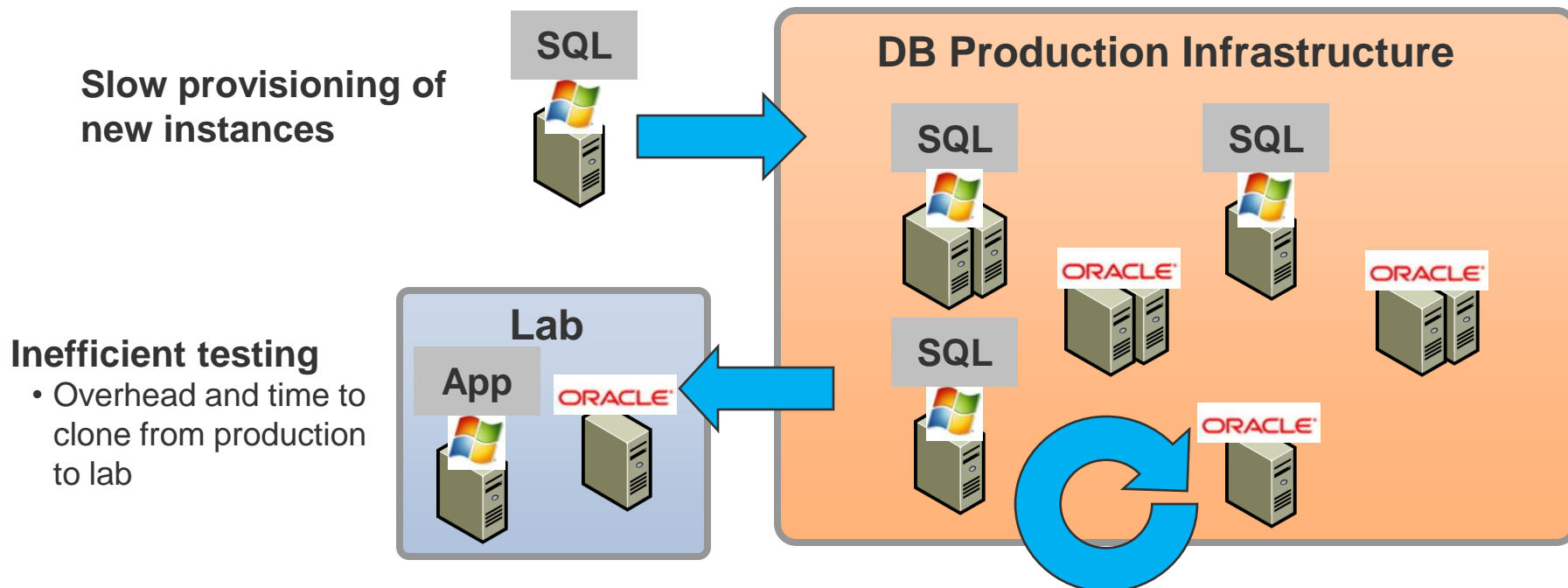
- No OS isolation (configuration, security, fault)
- Resource isolation requires Windows Resource Manager
- No load balancing across physical nodes

## Shared Instance



- No OS isolation (configuration, security, fault)
- No Database isolation
- Resource isolation requires Oracle Resource Governor
- No load balancing across physical nodes

# Database Operational Challenges



- **Complex High Availability / Disaster Recovery**
- **Workload Management**
- **Upgrading hardware**
- **Handling Compliance Audits**

# Distributed Resource Scheduling (DRS)

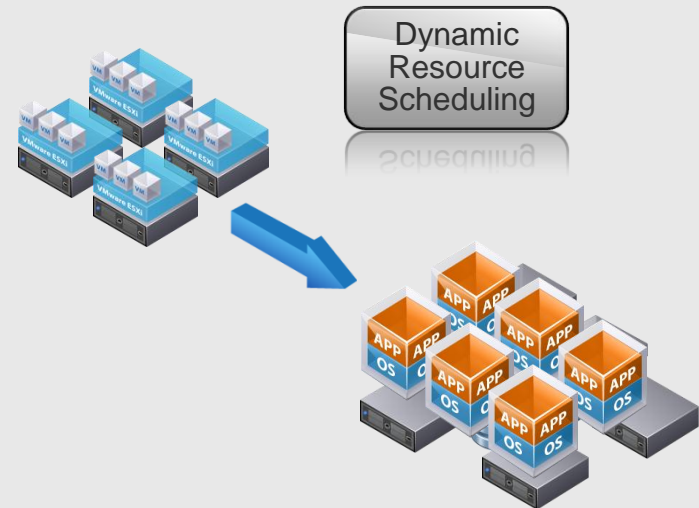
## Distributed Resource Scheduling

- Align IT infrastructure with business goals
- Dynamic allocation of compute resources

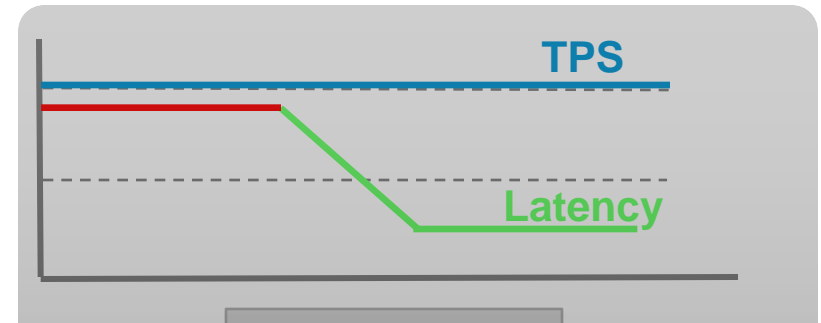
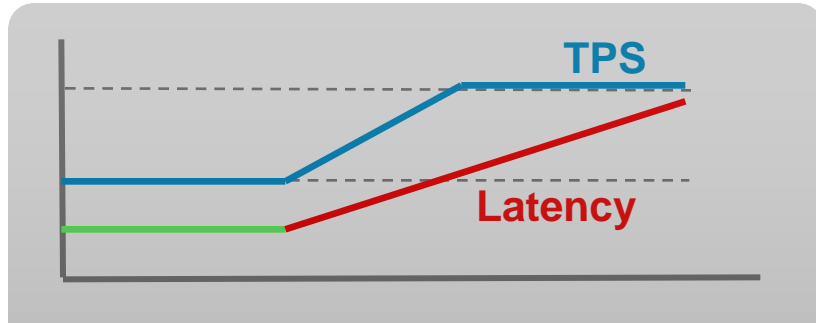
## Let DRS Manage Oracle Instances

- Database workloads are both dynamic and transient
- Directs compute resources where needed
- Maintain database response times and SLA's

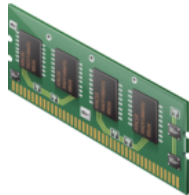
## Automated Oracle Management *Infrastructure Abstraction*



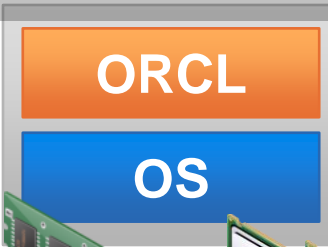
# Hot-Add Capacity to Guarantee QoS



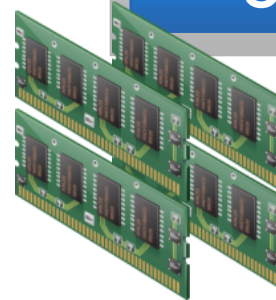
2 GB



1 vCPU



8 GB



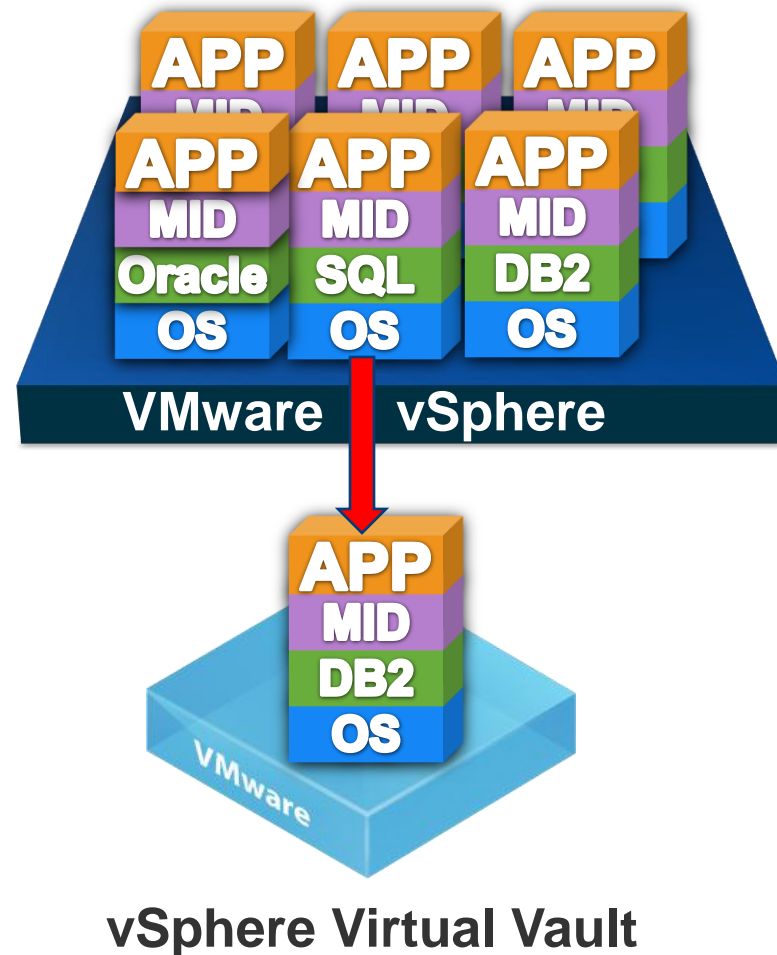
4 vCPU

- > Hot-add capacity with zero application downtime
- > Minutes to stabilize VM and recover from SLA violation
- > Other options include vMotion to more powerful host & add instance for fast scale-out

# Using vSphere for Compliance Purposes

## Cloning a Fully Virtualized Application Captures the Entire State of Stack

- VM can be cloned and stored in a virtual vault/archive
- Then powered on in the event of an audit or discovery request
- Significantly simplifies environment regeneration process
- Hardware independent regeneration and recovery
- There is no single answer or magic solution to achieve compliance
- Capturing whatever solution suits a customers environment in a VM is a powerful step towards compliance



# Understanding Database Restart and VMware HA

## Oracle Crash Recovery

- Automatic upon Instance Restart
- Uses On-Line Redo & Datafiles only
- Oracle Crash Recovery Process will:
  - Apply pending updates in redo logs
  - Rollback uncommitted transactions
- Recovery Time Dependencies:
  - Amount of redo generated
  - User configurable parameters
  - Database version
- Fundamental to any Disaster Restart Solution

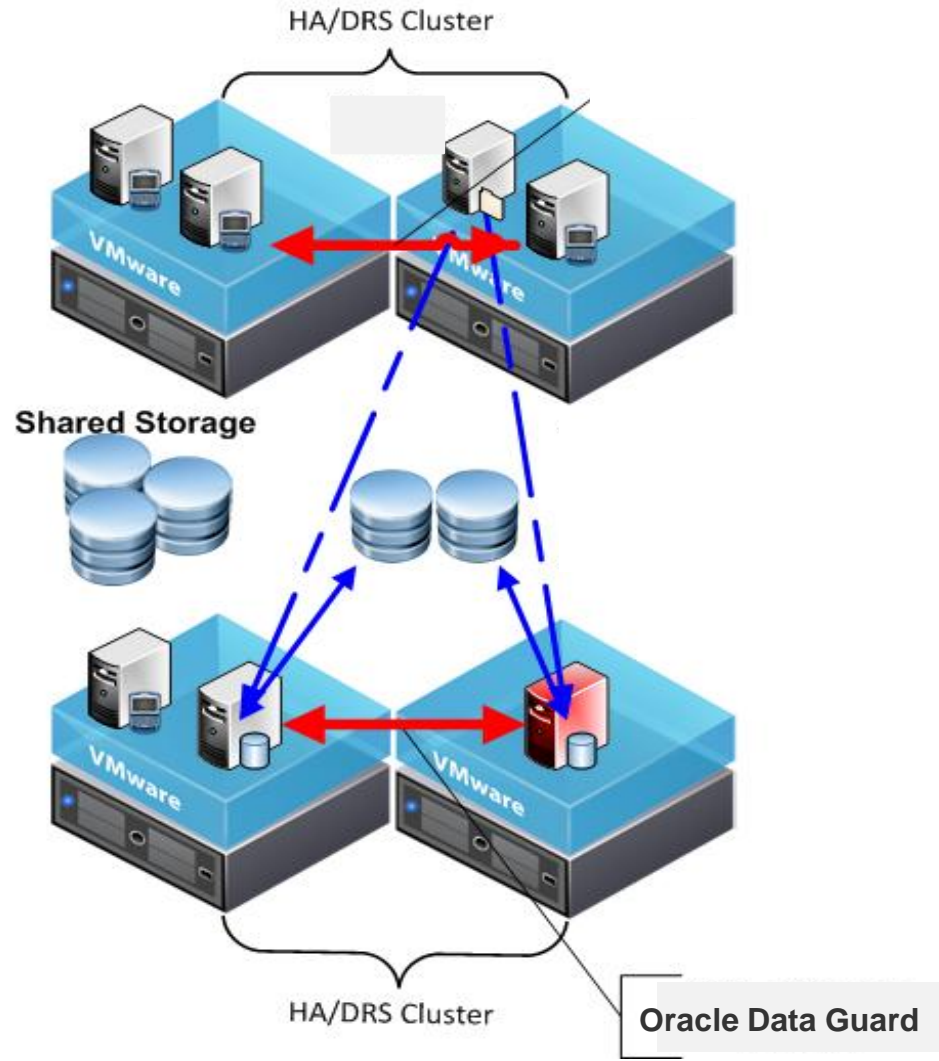
## Oracle with VMware HA

- Is a Database Restart Solution
- Leverages Oracle's bullet-proof Crash Recovery Processes
- HA does NOT introduce the possibility of datafile corruption
- Eliminates Single Point of Failure
- As with all Database Restart Solution
  - Does not protect against physical damage to datafiles
  - Is not a Backup/Restore Solution

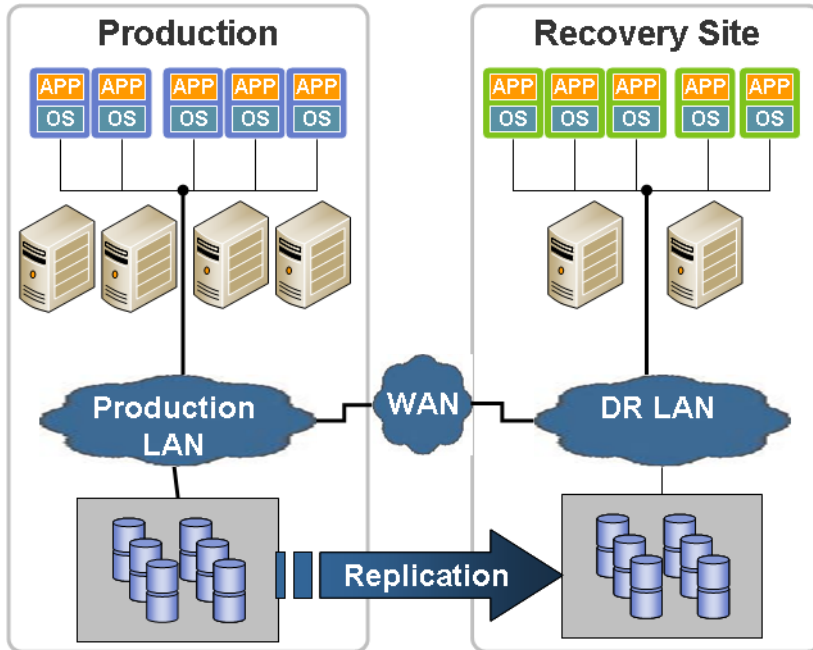
# Oracle Database Mirroring with Data Guard and HA

## Characteristics

- > Cluster required? – No
- > Recovery time – Immediate
- > Recovery point – ranges from 1 Redo log lost (Asynchronous) to No Data Loss (Synchronous)
- > Protects from – hardware, OS, and application failure.
- > Use RDMs or VMDKs for the database disks
- > iSCSI or Fiber Channel
- > Safe for vMotion and DRS!
- > Combine with HA for Faster protection after failure
- > No downtime – Upgrade of DB and OS



# Remote Site Disaster Recovery (Site Recovery Manager)



## Integrate with replication

- > Identify which virtual machines are protected by replication configuration

## Map recovery resources

- > Server resources, network resources, management objects

## Create recovery plans

- > For virtual machines, applications, business units
- > Convert manual runbook to pre-programmed response
- > Customizable with scripting and callouts

- ***Simplify configuration of recovery infrastructure and process***
- ***Simplify coordination of replication with virtual environment***

# Benefits of Oracle on VMware

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## Performance

- IO is not an issue
  - Scale up and out
  - Newer HW can Increase Performance
- 

## Server Consolidation

- Fully Utilize Hardware
  - Maintain Application Isolation
  - Scale dynamically and right-size infrastructure
- 

## Rapid Provisioning

- Streamline activation, deployment, and validation of servers
  - Avoid Manual Configuration Errors
- 

## Workload Management

- Zero Downtime Maintenance
  - Migrate Live Databases
  - DRS
- 

## High Availability

- VMware vMotion, HA
  - Without Clustering or RAC
- 

## Business Continuity

- VMware Site Recovery Manager
- HW Reduction at failover site
- Comprehensive Testing of DR solution

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Summary

- Canadian Pulp Paper Manufacturer
  - World's Largest provider of Newsprint Paper
  - Pulp paper products used in over 80 countries worldwide
- IT infrastructure
  - 400 Servers and 4000 Desktops,
  - 80 VMs on 8 ESX hosts in primary datacenter
  - Running 7 SQL Server databases , 6 Oracle databases, Lotus Notes, and JD Edwards Enterprise One on ESX 3
- 2 separate JDE Virtual deployments due to merger
  - Modules include GL, AP, AR, Transportation and Order Management
  - Approximately 12000 Transactions and 600 users per day
- Oracle BI databases Virtualized

- One of largest Oracle E-Business Suite implementation in the World
  - Largest user of Service, Install Base, Contracts, Configurator, Sales
  - One of Largest iStore, Projects and Order management
  - All Tiers except the RAC databases are virtualized
- E-Business Suite Statistics
  - 2 Million Quotes, 9 Million Service requests, 1.4 Million Service Contracts
  - Database Size 8 TB (6 node RAC cluster) each SGA 32 GB
  - Database Transactions/Sec 754 (22 million/day)
  - IOPS 15K
- Oracle VM Virtualization Footprint Summary
  - Non Production (OBIEE, 11i, R12, BEA, Fusion) 210 VMs
  - Production 300 VMs

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- Performance is not an issue anymore
  - Get immediate ROI by deploying Oracle databases on vSphere
  - DBA's should not fear virtualization; their skills are fully transferable
  - Both production DBA's and database architects include VMware virtualization
- Use vMotion and Dynamic Resource Scheduler to manage your Oracle environment
  - Without vMotion, how can DBA's perform zero downtime maintenance
  - Customize DRS to meet business needs
- Don't leave your database non-virtualized or the business is exposed
- Virtualization should be part of a customer's compliance strategy
- Yes we have an Oracle support statement

**Muchas Gracias!**