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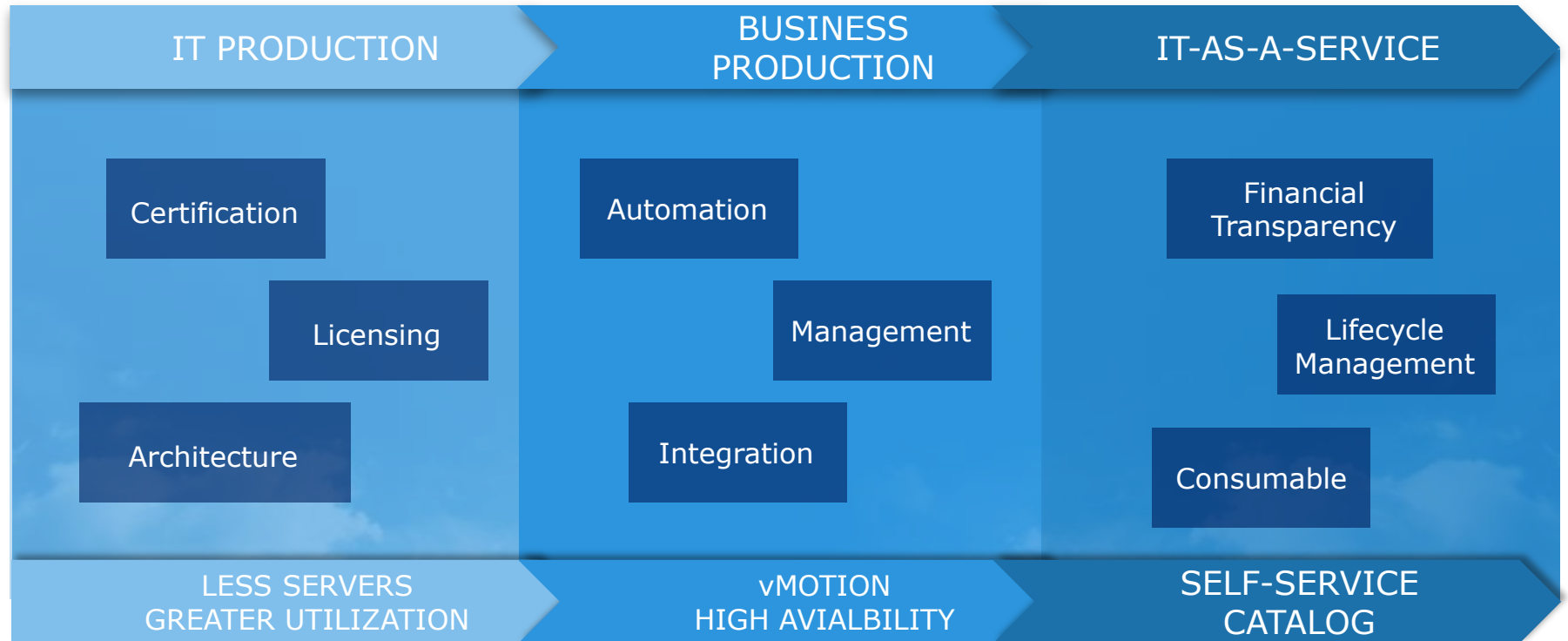


BEST PRACTICES FOR VIRTUALISING ORACLE DATABASES

REPLATFORMING, COST REDUCTION & PERFORMANCE BENEFITS

EMC²

Virtualization Conversation



Database re-platforming: Goals

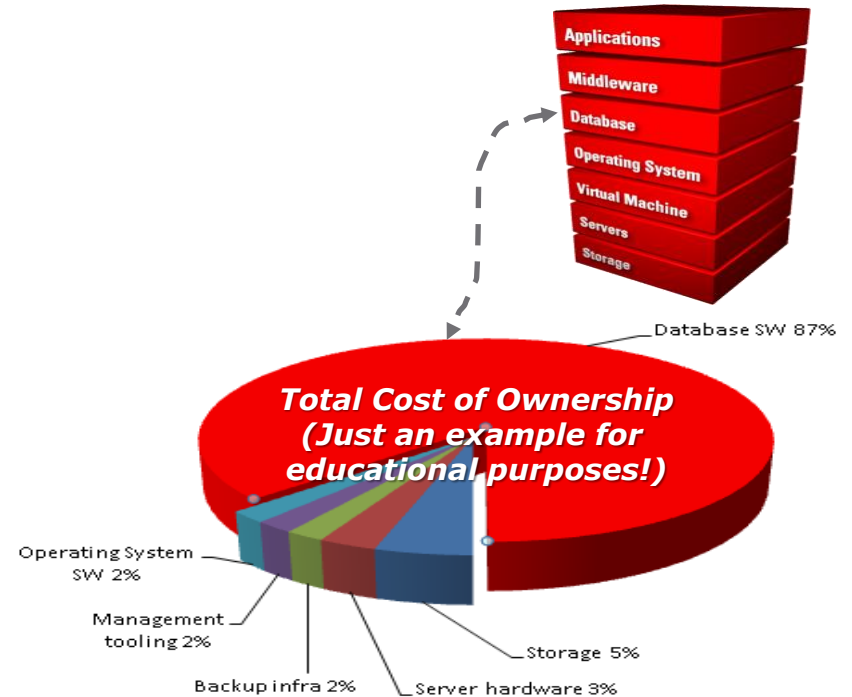


1. *Maximize use of license investment*
2. Maintain or (better even) improve performance
3. Reduce downtime / increase SLAs
4. Avoid Vendor lock-in
5. Simplify server & storage refresh cycles
6. Speed up provisioning of new databases
7. Improve security, compliance and auditing
8. Simplify management



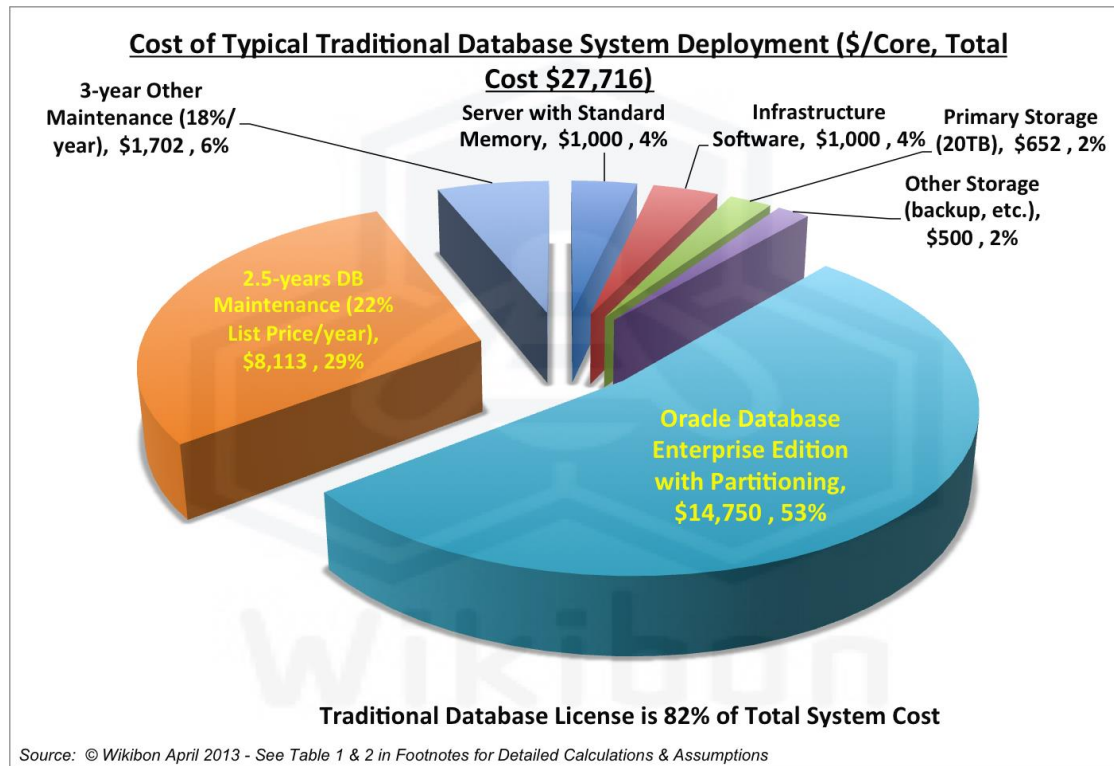
Why look at licensing?

- Oracle DB licensing is expensive
 - Midsize server (24 cores):
HW ~ \$ 50,000
SW ~ \$ 483,000 @ 50% discount
5Y maintenance ~ \$531,000
(Enterprise Edition + basic options)
- What if we add RAC? Active DG?
Pluggable DB?
- Large part of the TCO of a database infrastructure stack



If we can save 10% on db licenses...
We easily justified 50% more expensive infrastructure

Validation: Wikibon Research



Wikibon Article: [Virtualization of Oracle Evolves to Best Practice for Production Systems](#)

Before we start...

Beware of the license demon

100% SURE YOU
ARE COMPLIANT?



ORACLE®
LICENSE MANAGEMENT
SERVICES



If needed...
Bring in the superheroes
They help you with licensing
& legal issues



Licenseconsulting.eu



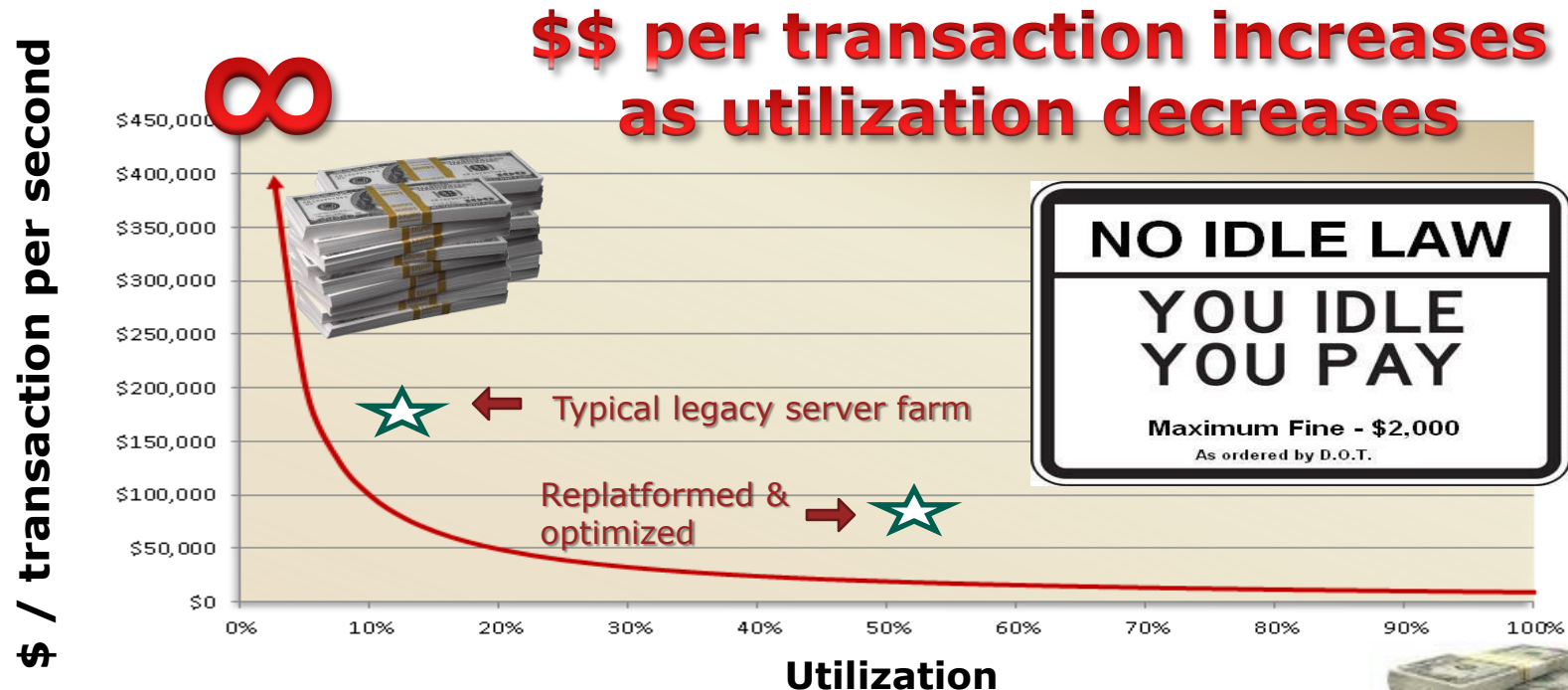
House of Brick Technologies



Madora Consulting UK

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Transaction cost vs. utilization

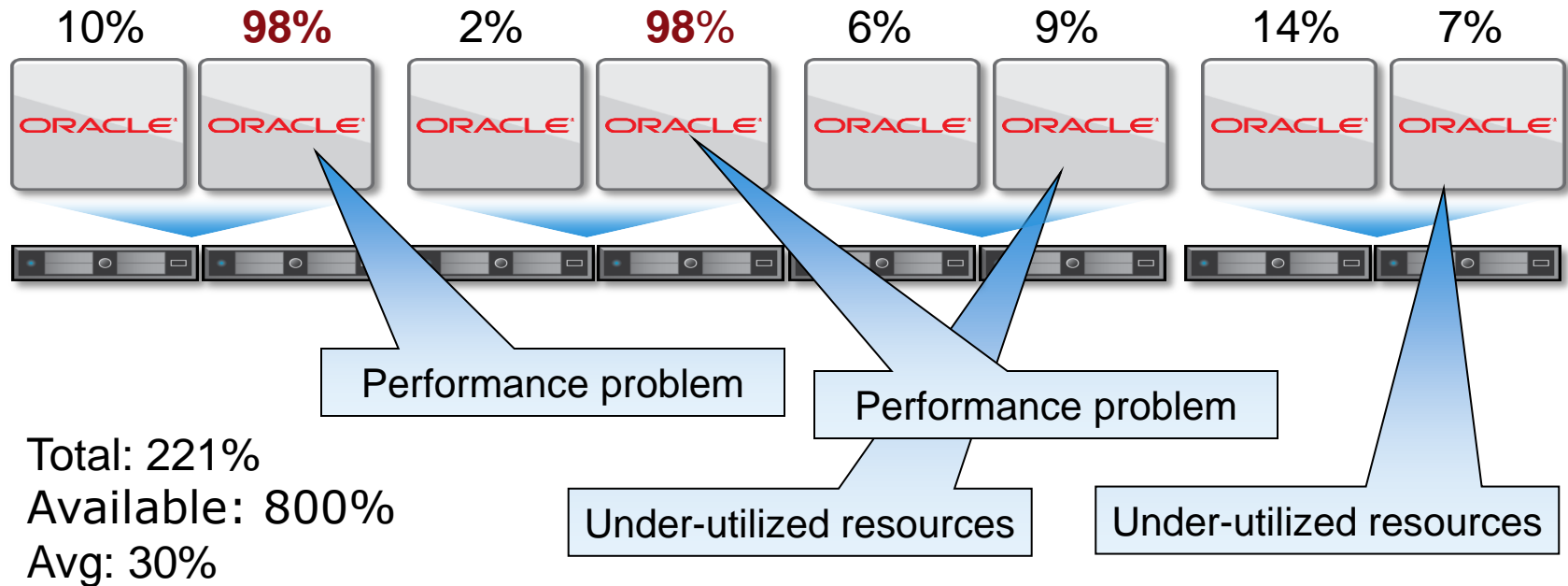


Cost per TPS for a four-node Oracle RAC 11g cluster running EE
Software license cost: around \$2,200,000
TPS: Around 4,000 at peak utilization



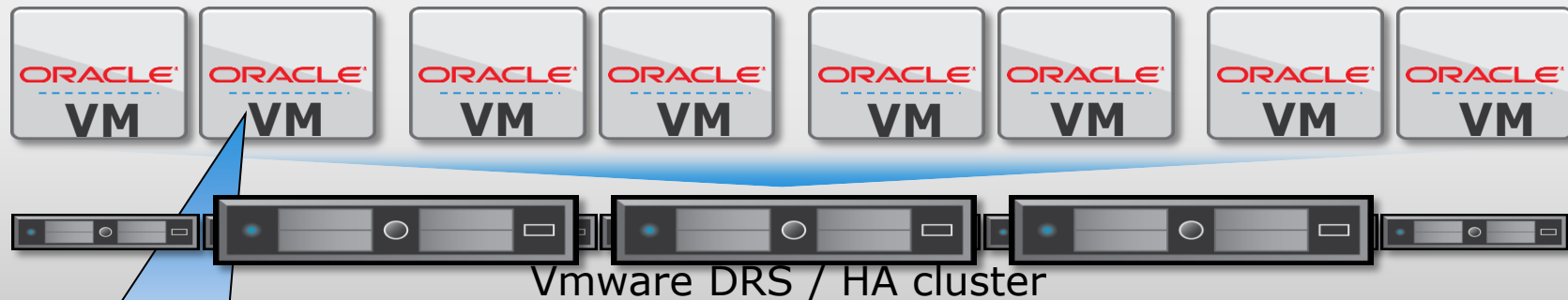
Classic problem of resource management

(applied to DB processing power)



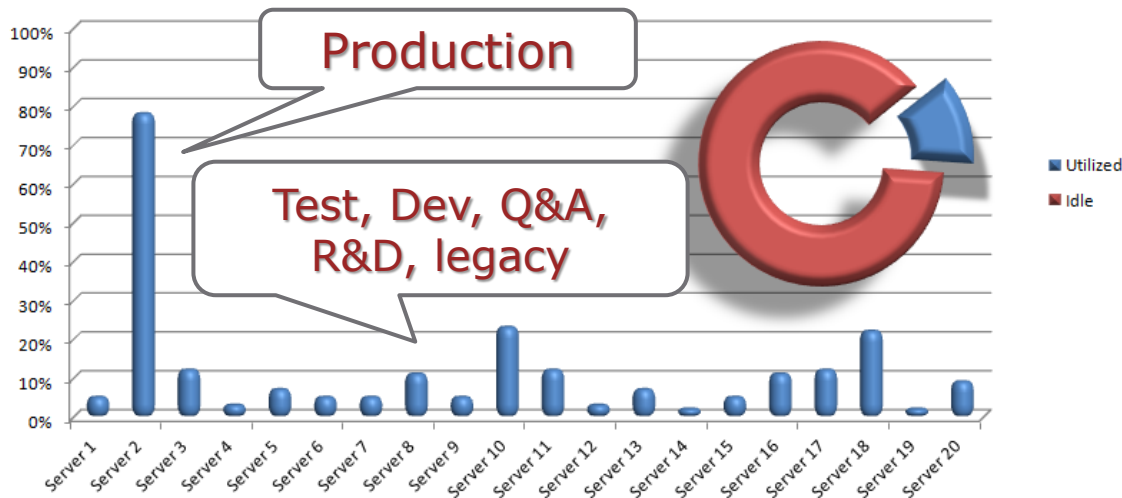
Resource Management

"Mainframe style"



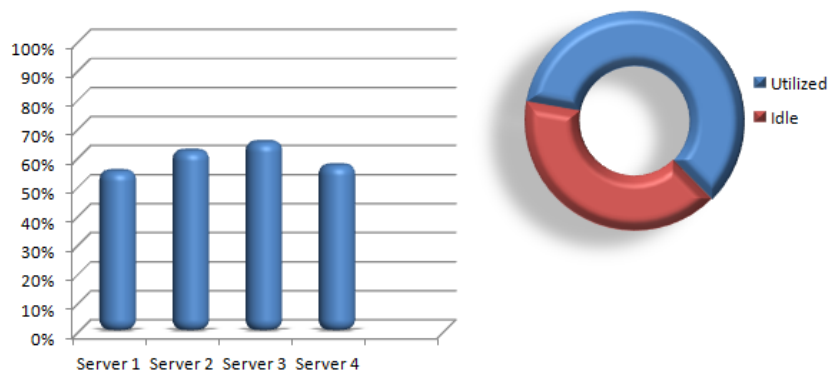
Assign CPU & memory "shares" to guarantee Production SLAs

Move CPU resources / workloads where needed



Typical legacy database server farm:

- Physically deployed
- Oversized
- Outdated platforms
- Very poor CPU utilization
- IO & CPU bottlenecks
- Servers running mix of:
 - Apps, middleware & DB
 - Tooling
 - Replication & Backup





Optimized database server farm:

- Virtualized
- Significantly less CPUs on Modern HW
- High average CPU utilization
- No I/O bottlenecks
- Sized correctly
- Servers running ONLY Oracle
- Minimal required licenses & options

5 steps to TCO reduction

Getting the best Return on Investment

1. Replatform for lowest \$ / transaction
 - And eliminate I/O problems, backup, etc → 
2. Virtualize servers to drive up CPU utilization
3. Remove unnecessary licensed options
 - Or go to different license model (i.e. Standard Edition)
4. Only run DB transactions on licensed CPU
5. Re-negotiate license contracts → 
 - Suspend maintenance, etc
 - Avoid non-compliance, audits, support issues, ...



ROAD BLOCK #1: SUPPORT

ORACLE NOT SUPPORTED ON VMWARE?

My Oracle Support note 249212.1

Purpose

Explain to customers how Oracle supports our products when running on VMware

Scope & Application

For Customers running Oracle products on VMware virtualized environments

Support Status for VMware Virtualized Environments

Oracle has not certified any of its products on VMware virtualized environments. Oracle Support will assist customers running Oracle products on VMware in the following manner: **Oracle will only provide support for issues that either are known to occur on the native OS, or can be demonstrated not to be as a result of running on VMware.**

If a problem is a known Oracle issue, Oracle support will recommend the appropriate solution on the native OS. If that solution does not work in the VMware virtualized environment, the customer will be referred to VMware for support. **When the customer can demonstrate that the Oracle solution does not work when running on the native OS, Oracle will resume support, including logging a bug with Oracle Development for investigation if required.**

If the problem is determined not to be a known Oracle issue, we will refer the customer to VMware for support. When the customer can demonstrate that the issue occurs when running on the native OS, Oracle will resume support, including logging a bug with Oracle Development for investigation if required.

NOTE: Oracle has not certified any of its products on VMware. **For Oracle RAC, Oracle will only accept Service Requests as described in this note on Oracle RAC 11.2.0.2 and later releases.**

Source: [My Oracle Support website](#), [VMware Oracle Support Statement](#)

Oracle Support will assist customers running Oracle products on VMware ... in the following manner...

Is Oracle certified to run on VMWare?

By Mike Dietrich-Oracle on Jan 17, 2011

This question in similar occurrences gets asked during **every Upgrade Workshop** at least once. People would like to know if they can run an **Oracle Database** or **Oracle Real Application Clusters** or **Oracle Grid Control** or **Oracle Fusion Middleware** or ... in an VM environment with **VMWare's virtualisation products**.



And the answer is: **Yes, you can!!**

But ... there's a **fine print** you should take care on before setting up virtual environments with a different solution than XEN based **Oracle VM**.

Please read **Note:942852.1 - VMWare Certification for Oracle Products** and **Note:249212.1 - Support Position for Oracle Products Running on VMWare**

Virtualized Environments for further details:

[Oracle blog:](#)
[Is Oracle certified to run on VMware?](#)

Comments:

Considering the fact that Oracle is probably the most expensive database available in the market these days, I would think that they would be a little more mature to try and support VMware.

Posted by **Charl** on January 18, 2011 at 11:56 PM CET #

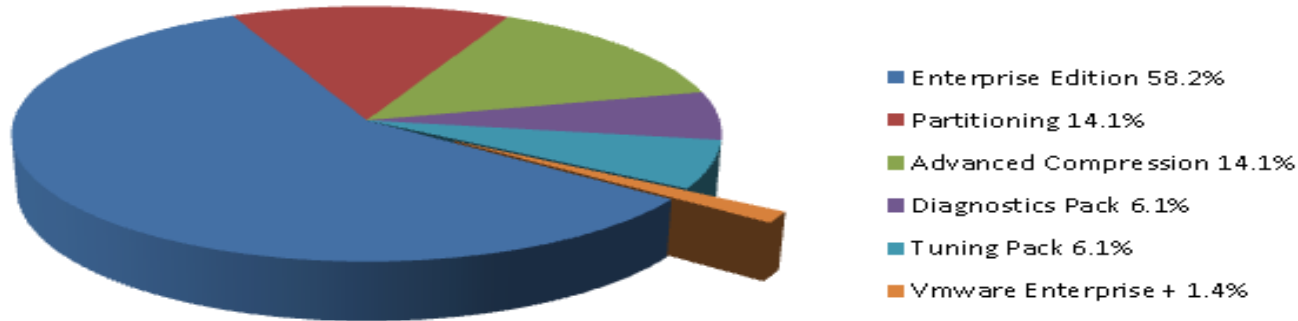
Charl, thanks for your comment - and I believe there's a misunderstanding because of the wording sequence of the support note. We DO SUPPORT Oracle on VMware environments. You just have to take into consideration in case of a failure that it could happen that you'll have to be able to reproduce misbehaviour of an Oracle product



ROAD BLOCK #2: LICENSE COST

LICENSE COST HIGHER ON VMWARE VS
PHYSICAL OR OTHER HYPERVISORS?

VMware - Expensive?



- VMware licenses make up less than 2% of total SW licensing
- Will even be lower if you go to 8 cores/socket (common)
- Or if you use Oracle RAC or other additional options

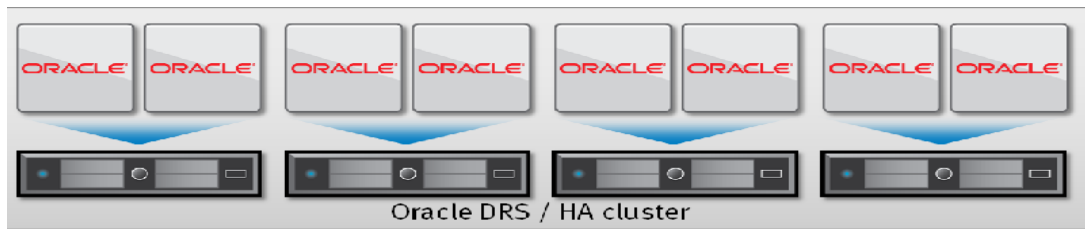
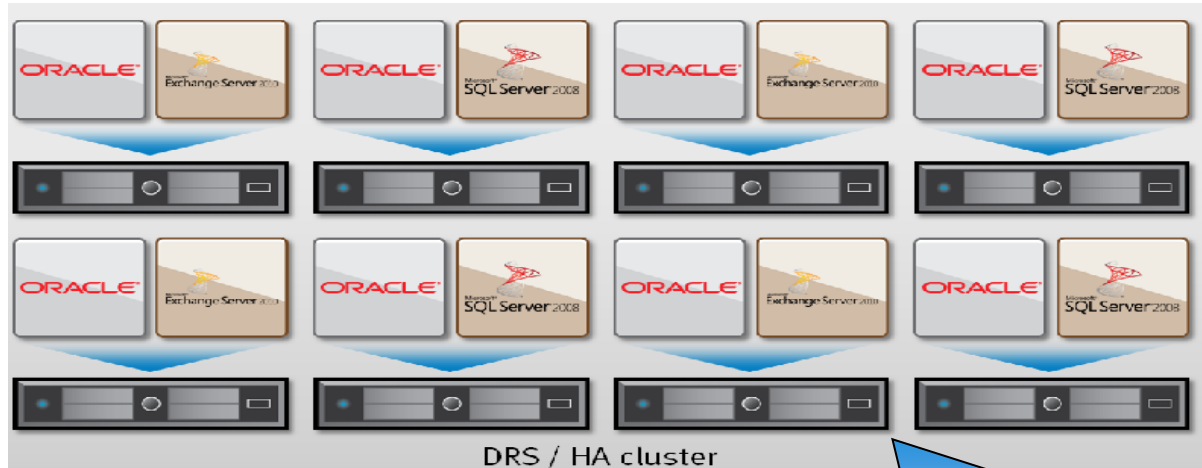
Server: Dual-Socket, 12 core X64

DB licenses: Oracle Enterprise + Partitioning + Advanced Compression + Diagnostics & Tuning pack

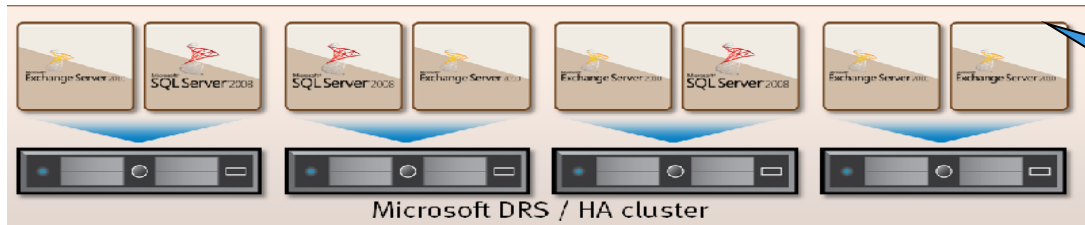
VMware licenses: Enterprise Plus (most expensive type)

Based on publicly available list pricing - All other costs (HW&SW) ignored for simplicity

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Poorly managed licensing
(Expensive – requires 8 servers fully
licensed)



Well managed licensing
(Savings – only requires 4 servers
fully licensed)

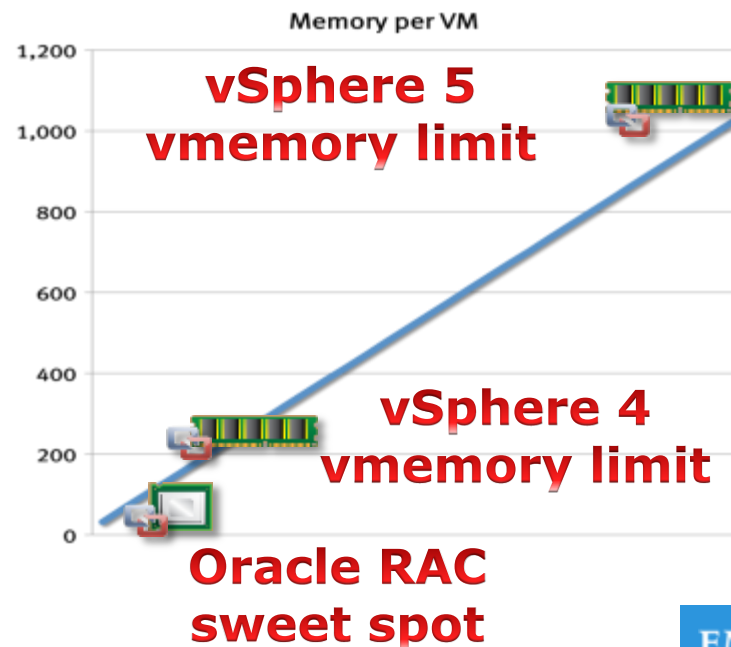
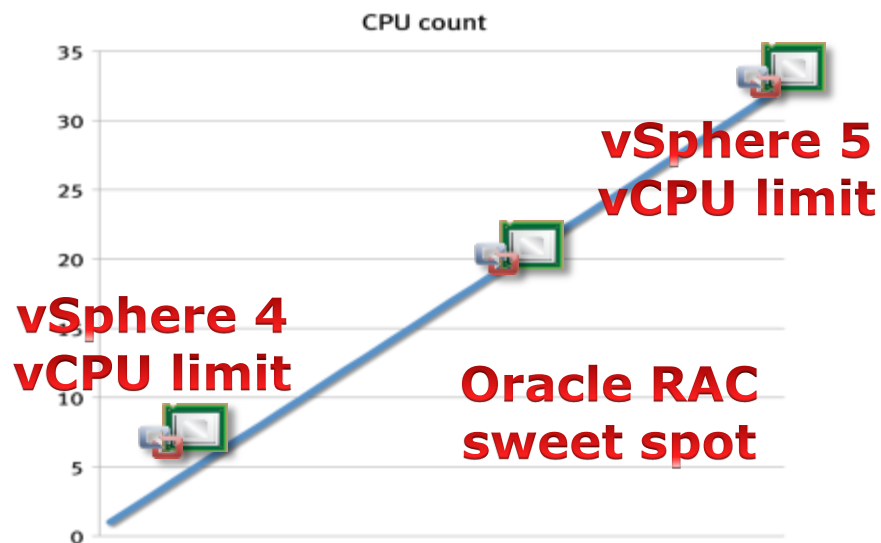


ROAD BLOCK #3: SCALABILITY

MAXIMUM WORKLOAD ON A SINGLE VM

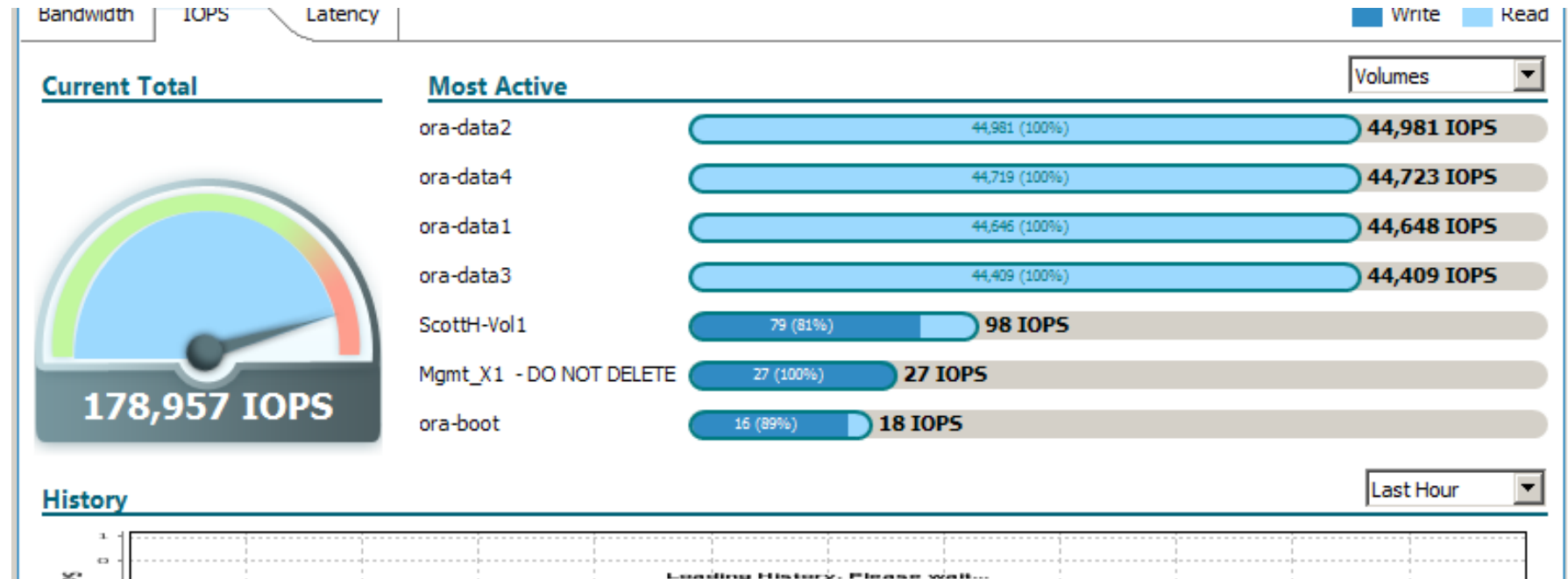
vSphere 5 - limits on vCPUs and memory

vSphere 6: 128 vCPU / 4 TiB memory per VM



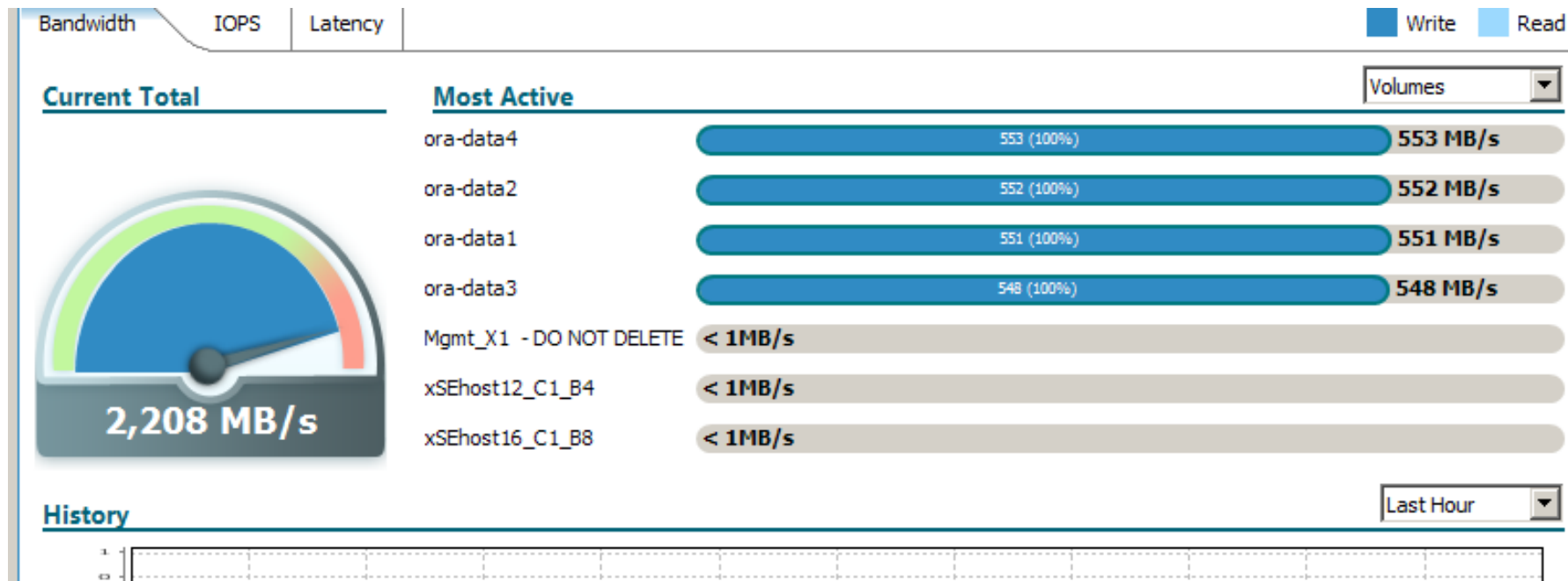
Performance example with SLOB

Lab test: 1 v2.4 X-Brick, 3 VM's Oracle 11.2.0.4.0, VMDKs



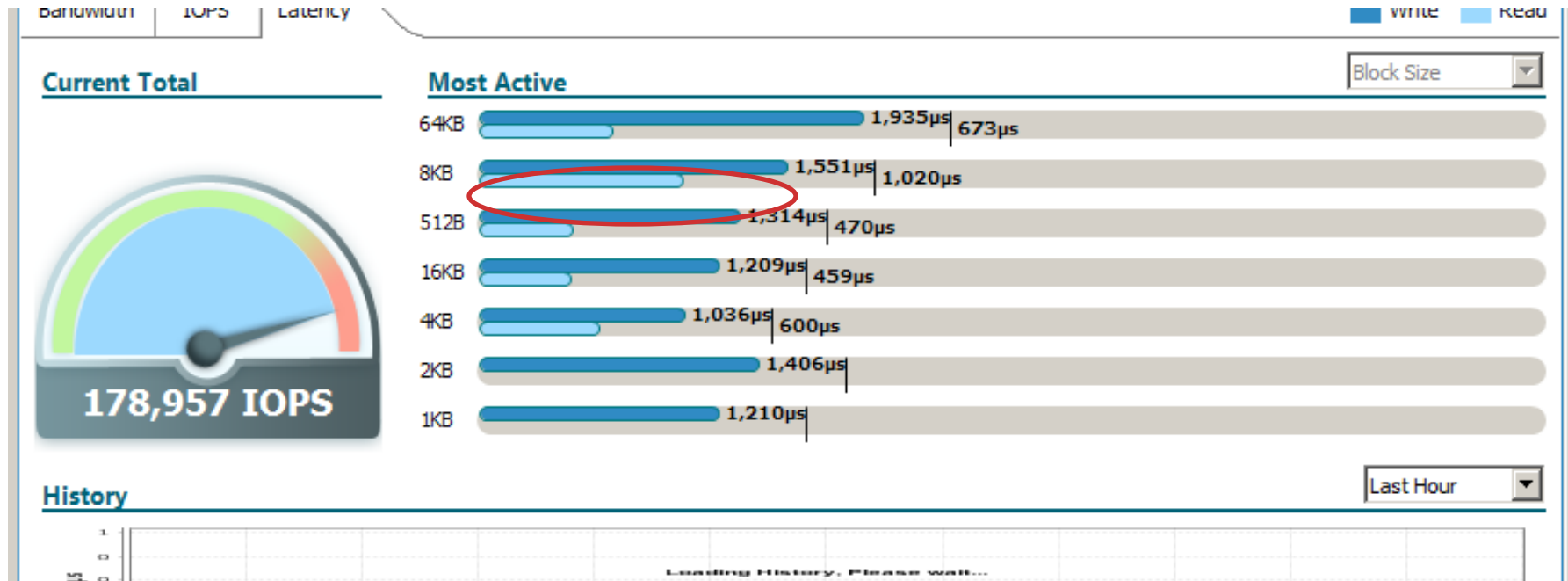
Performance example with SLOB

Bandwidth



Performance example with SLOB

Latency (nearly all I/O is 8K random)



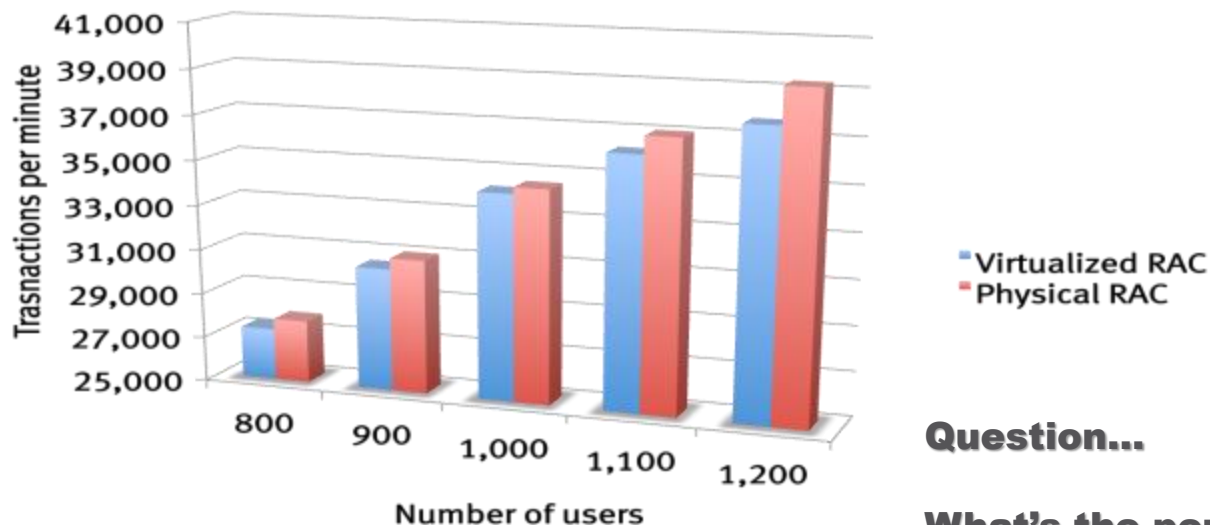


ROAD BLOCK #4: OVERHEAD

PERFORMANCE IMPACT OF VIRTUALIZATION

Performance overhead physical vs. virtual

EMC IT analysis: ~ 4% (vSphere 5.1!)



Question...

What's the performance overhead of:

- **Oracle RAC ?**
- **Host replication ?**
- **Advanced Compression ?**
- **Transparent table encryption ?**



ROAD BLOCK #5: PLATINUM SUPPORT

ONE STOP SHOPPING FOR SUPPORT?

VMware extended support for oracle

Total Ownership

VMware Support will accept accountability for any Oracle-related issue reported by a customer. By being accountable, VMware Support will drive the issue to resolution regardless of which vendor (VMware, Oracle, or others) is responsible for the resolution. In most cases, reported issues can be resolved via configuration changes, bug fixes, or feature enhancements by one of the involved vendors.

In the rare situation that another vendor is unable or unwilling to provide a satisfactory technical resolution, VMware Support will immediately notify the customer, assist in escalation and explore other potential technical workarounds with the customer.

VMware will also assist its customers with technical issues for other Oracle software products, besides the Oracle Database and provide similar [escalation assistance](#) if needed.

Besides technical assistance, VMware Support will advocate on the customer's behalf to:

- Provide any relevant evidence that virtualization does not play a part in the Oracle product technical problem
- Engage Oracle Support in resolving the customer's technical issue, escalating management attention as appropriate

<http://www.vmware.com/support/policies/oracle-support.html>

EMC support for Oracle on VMware



EMC E-Lab and VMware have tightly collaborated on support for use of Oracle Database 11g in VMware environments. This includes extensive testing and qualification of VMware virtualization software with EMC and Oracle technologies, combined with EMC and VMware joint support.

In addition, EMC and VMware have documented a series of Proven Solutions which outlines how to design, deploy, and manage VMware virtualization software in EMC and Oracle environments. Through seamlessly integrating VMware into EMC and Oracle environments, IT organizations can dramatically increase hardware utilization, consolidate servers, and improve efficiency.

<http://www.emc.com/solutions/application-environment/oracle/oracle-virtualization-vmware.htm>



ROAD BLOCK #6: NO INTEGRATED STACK

OPTIMIZED SYSTEM FOR DATABASE WORKLOADS?

EMC/VCE VBLOCK OPTIMIZED SYSTEM

Single SKU – All-Flash - optimized for database workloads



**Pre-Engineered,
Pre-Validated, Pretested**

Oracle on VMware

Best practices and guidelines



Avoid compliancy issues

Make sure you are ALWAYS compliant with licensing

- Prohibit illegal live migrations
 - IO fencing, rules, network isolation
- Audit movements
 - Insurance policy against the license police
- Be careful with management tools
 - Vcenter 6.x & cross-cluster migrations? (!)
- Know the rules
 - 10-day rule? Sub-server partitioning? SE vs EE? CPU based vs NUP? Etc etc.
 - Don't hesitate to hire external license consulting (LMS audits can be much more expensive)
- CxO / IT management: Make your DBA team responsible for being compliant
 - Let them report every 6 months

Capitalize on better infrastructure

Replace or enhance expensive licensed options where possible

- Advanced Compression -> Storage compression
 - Works for ALL data
 - No additional license
- RAC -> VMware HA
 - Reduces complexity, improves performance and eliminates \$\$\$ license
 - No free lunch: HA is active/passive (failover = few minutes, crash restart)
- Active Data Guard -> SAN replication
 - Replicate an ENTIRE Business Landscape AT ONCE (1 point of control)
 - RELIABLE (zero dataloss or async – but always consistent), independent from DB, OS, Server, etc
 - Improves failover/failback scenarios (no standby rebuild)
 - No Force Logging or even archive logging required

Choose the best CPU available

Based on \$/transaction (TPC-C per core)

CPU power

- The more powerful the CPU is per core, the more workload you can run with the same footprint (Without adding licenses!)

Memory size

- Oracle runs better with lots of RAM (SGA)
- More RAM allows more VM's per host

TPC-C benchmark for OLTP

- The industry standard – but not all servers listed (Oracle “Engineered” systems are missing...)
- If you're creative you can find similar CPUs and their TPC ratings – or look at SPEC ratings to compare CPU power

Powerful CPU cores are more efficient

- High TPC-C and/or SPEC ratings will allow you to drive higher consolidation ratios - And provide better performance

Minimize overhead where possible

- VMware: 4% (verified by EMC) – vSphere 5.1 (!)
- Oracle RAC – 10%? (conservative estimate)

Note: Intel E5-2697v2 ~ 115,000 TpmC/Core (estimate)

Intel E5-v3 ~ 125,000 TpmC/core (estimate)

SPARC T5 ~ 66,800 TpmC/Core (used in SPARC Supercluster T5)

IBM POWER 7+ ~ 150,000, POWER 8 200,000+ (but beware of core factor)



Processor types and TPC ratings	TpmC/Core
Intel X5690	87758
Intel E7-8870	63199
Intel E5-2690	100574
Intel E5-2643	100574

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Eliminate I/O bottlenecks

- Driving up CPU utilization only possible if we can feed data quickly enough to/from the CPU
 - Some apps need high bandwidth (measured in Mbyte/s)
 - Some apps need many IOPS (I/Os per second) at low latency
- Traditional “spinning disk” storage is limited
 - Disk Capacity is high, bandwidth and latency is poor
- Solution: Flash based storage
 - Either Hybrid Disk + Flash or All-flash
- Typical All-flash Array metrics:
 - 100,000’s of IOPS @ sub-millisecond latency
 - Many Gigabytes/s bandwidth
 - Not sensitive to mixed workloads
 - Some beneficial side effects (inline compression, de-duplication, zero-overhead snapshots, ...)

VMAX³

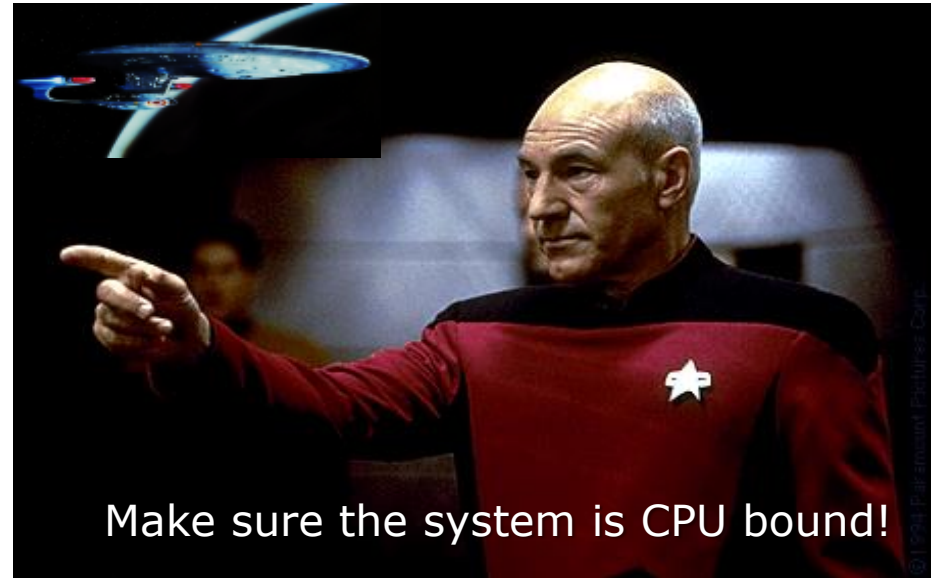


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Databases shouldn't have high I/O wait

- Adding CPU does not speed up I/O bottlenecks
 - Memory does somewhat
- IOPS are relatively (!) cheap
- CPU cycles are expensive
 - Because of licenses
- Consolidation leads to
 - Higher IO requirements
 - I/O bottlenecks
 - Bandwidth issues
- Flash storage can solve these limitations



STORAGE IS NO LONGER THE BOTTLENECK

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Other Best Practices for virtualizing Oracle

- Enable hugepages
- Tune NUMA settings
- Honour storage best practices
 - Data layout
 - Disk alignment
 - Multipath/IO balancing
- No parasite workloads
 - Middleware / apps
 - Monitoring agents
 - Replication/mirroring etc
 - ETL
- Run standardized benchmarks
 - Not (only) your own app
 - SLOB for I/O
 - Swingbench for CPU
- Run failure tests
 - Kill a physical server
 - Pull an FC cable
 - ... etc
- Use Virtualization-aware management tools

Enjoy freedom of choice

Break dependency from the lock-in dragon

- What's a Virtual Machine anyway?
 - Configuration files
 - Data set
- Both can be moved to other platforms
 - Different hypervisors
 - Different servers
 - Different storage

(But... Keep running on EMC ;-)

"Oracle as a Service"

Next Steps into the Cloud- "Database as a Service"



Cloud Enabled Infrastructure



vmware®
vCloud® Air™
vCloud Air™ Network

Delivering **Best of All Worlds**



EMC²

Pivotal

RSA

VCE

virtustream

vmware

EMC & VMware Deep Integration

Enabling A Superior Private Cloud Environment



AUTOMATED PROVISIONING

Integrations between EMC VMAX, VNX, Avamar & Data Domain and VMware vRealize

Integrations between EMC VMAX, VNX & Virtual Storage Integrator (VSI) and VMware vCenter



SELF-SERVICE

VMware vRealize Self-service Portal



MONITORING

Integrations between EMC Storage Analytics and VMware vCenter Operations Manager & Log Insight



METERING & CHARGEBACK

VMware vRealize Automation Center & vCenter Chargeback and IT Business Management Suite



SECURE MULTI-TENANCY

VMware vRealize Automation Center

EMC IT: Past vs. Present

Strategy

Design and Approve

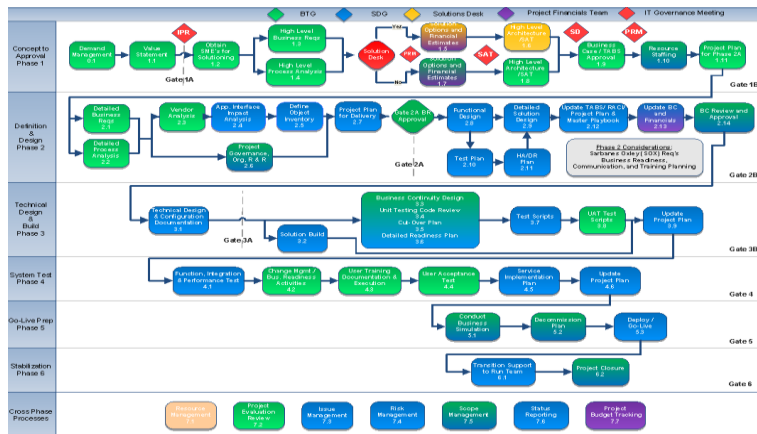
Order Equipment

Build

Test

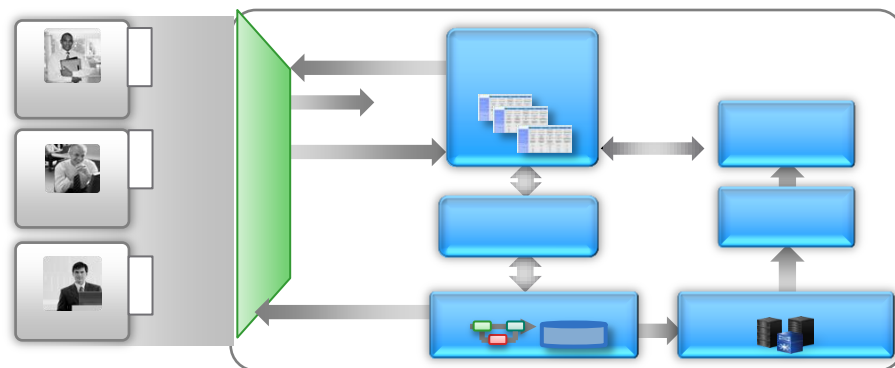
Deploy

Previous Timeline: ~4 Months



Custom Configurable
Manual Solution

New Timeline: < 1 Hour



Standard Automated
Delivered

Order and Build On Demand

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Enabling and Provisioning Oracle DBaaS


vRealize Automation Service Catalog


Home Catalog Items Requests Inbox Advanced Services Administration Infrastructure


Service Catalog

Browse the catalog for services you need.


 All Services

 ITaaS

 Oracle


 Red Hat

All Services (3)




Oracle DBaaS
Provisions an 11g or 12c Oracle Database

Request



Oracle DBaaS (Backup)
Oracle DBaaS Service with an Avamar scheduled full RMAN backup to Data ...

Request



Oracle DBaaS with OE...
Installs an Oracle Database, 11g or 12c, including an OBM 12c Agent for central ...

Request

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Enabling and Provisioning Oracle DBaaS

Provisioning an Oracle database – Day 1

Home Catalog Items Requests Inbox Advanced Services Administration Infrastructure

New Request



Oracle DBaaS
Install 11g or 12c Oracle Database Software and creates a database (general) with optional monitoring.

Request Information

Node Properties

Service Properties

Ora_DB_v1.0.0

- * selected_language: English
- * install_edition: Enterprise Edition
- * email_address: Standard Edition
- * email_address: Enterprise Edition
- * domainname: us.oracle.com
- * sid: orclpdb
- * systempassword:
- * syspassword:
- * enable_archive_log_mode: true
- * characteraset: AL32UTF8
- * national_characteraset: AL16UTF16
- * oracle_version: 12c
- * local_management: true

Oracle DBaaS Enabling and Provisioning

vRealize Automation Application Services – *Application Blueprint*

Oracle DBaaS (OEM) v1.0.0 - Blueprint

Logical Templates

Database Servers

- CentOS 32bit with MySQL v1.0.0
- Ubuntu 64bit with GemFire v1.0.0
- W2K8 R2 Enterprise SP1 with SQL S...

OS Templates

- CentOS 32bit with MySQL v1.0.0
- CentOS63 32bit v1.0.0
- CentOS63 64bit v1.0.0
- CentOS64 32bit v1.0.0
- CentOS64 64bit v1.0.0
- RHEL61 32bit v1.0.0
- RHEL61 64bit v1.0.0
- RHEL-64 v1.0.0
- RHEL64 32bit v1.0.0
- RHEL64 64bit v1.0.0
- RHEL-64bit v1.0.0
- RHEL 6.5 64 Bit v1.0.0
- RHEL 6.6 64 bit v1.0.0
- RHEL 7.0 64 Bit v1.0.0
- SLES11 SP2 32bit v1.0.0
- SLES11 SP2 64bit v1.0.0
- Ubuntu12042 32bit v1.0.0
- Ubuntu12042 64bit v1.0.0
- Ubuntu 64bit with GemFire v1.0.0
- W2K8 R2 Enterprise SP1 v1.0.0
- W2K8 R2 Enterprise SP1 with SQL S...

RHEL-64bit_v1.0

Mnt_Ora_Artifact...

Ora_DB_v1.0.0

Oracle_Auto_Star...

Oracle_EM_12c...

Unmnt_Ora_Artif...

RHEL64 v6.5

DETAILS | NICS | DISKS

Name	Mount Path	File ...	Size ...	Tags	Description		
Disk1	/u01/app/oracle/binary	Auto	15	Binary	Binaries disk		
Disk0	/u03/app/oracle/data	Auto	15	Data	Data disk		
Disk3	/u02/app/oracle/log	Auto	15	Log	Log disk		
Disk2	/u04/app/oracle/archive	Auto	15	Archive	Archive disk		

Application Components

External Services

Services

Oracle

Application Servers

- Oracle Auto Startup Service v1.0.0
- Oracle EM 12c Agent v1.0.0

Database Servers

- Oracle11g v1.0.0
- Oracle12c v1.0.0
- Oracle Auto Startup Service v1.0.0
- Oracle Backup Service v1.0.0
- Oracle Database Service v1.0.0
- Oracle EM 12c Agent v1.0.0

Other

- Mount Oracle Artifacts v1.0.0
- Unmount Oracle Artifacts v1.0.0

Performance Management

- Oracle EM 12c Agent v1.0.0

Oracle DBaaS Enabling and Provisioning

vRealize Automation Application Services – *Application Blueprint*

vmware vRealize Automation Application Services

Applications Oracle2 (Oracle2) Help | Logou

Save Deploy

Oracle DBaaS (OEM/Backup) v1.0.0 - Blue...

Logical Templates

Database Servers

- CentOS 32bit with MySQL v1.0.0
- Ubuntu 64bit with GemFire v1.0.0
- W2K8 R2 Enterprise SP1 with SQL Se

OS Templates

- CentOS 32bit with MySQL v1.0.0
- CentOS63 32bit v1.0.0
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- CentOS64 32bit v1.0.0
- CentOS64 64bit v1.0.0
- RHEL61 32bit v1.0.0
- RHEL61 64bit v1.0.0
- RHEL64 32bit v1.0.0
- RHEL64 64bit v1.0.0
- RHEL-64bit v1.0.0
- SLES11 SP2 32bit v1.0.0
- SLES11 SP2 64bit v1.0.0
- Ubuntu12042 32bit v1.0.0
- Ubuntu12042 64bit v1.0.0
- Ubuntu 64bit with GemFire v1.0.0
- W2K8 R2 Enterprise SP1 v1.0.0
- W2K8 R2 Enterprise SP1 with SQL Se

Service External Service Application Component

RHEL-64bit_v1.0

Mnt_Ora_Artifact...

Ora_DB_v1.0.0

Oracle_Auto_Star...

Oracle_EM_12c_...

Oracle_Backup_...

Unmnt_Ora_Artif...

RHEL64 v6.5

Application Components

External Services

Services

Oracle

Application Servers

- Oracle Auto Startup Service v1.0.0
- Oracle EM 12c Agent v1.0.0

Database Servers

- Oracle11g v1.0.0
- Oracle12c v1.0.0
- Oracle Auto Startup Service v1.0.0
- Oracle Backup Service v1.0.0
- Oracle Database Service v1.0.0
- Oracle EM 12c Agent v1.0.0

Other

- Mount Oracle Artifacts v1.0.0
- Oracle Database Service v2.0.0
- Unmount Oracle Artifacts v1.0.0

Performance Management

- Oracle EM 12c Agent v1.0.0

DETAILS PROPERTIES ACTIONS

Library Service: Oracle Backup Service

Version: 1.0

Service Version Business Group: Oracle2-BG

Description: Calls a vCO workflow to register the client in Avamar. This Service assumes that the Avamar client binaries have already been installed as part of Oracle DB installation prereqs.

Pre-installed in a Template: ☐

Oracle DBaaS Enabling and Provisioning

vRealize Automation Application Services – *Service*

Oracle Database Service v1.0.0

Description: enter description

Tags: Database Servers

Supported Components: SQL SCRIPT

Business Group: Oracle2-BG

Sharing: Shared

Created By: Oracle2@ehc.sseu.local 05/28/15 10:44 AM
Last Edited By: Oracle2@ehc.sseu.local 07/29/15 12:32 PM

Supported OSes: RHEL64 v6-4.0 RHEL64 v6-5.0 RHEL64 v6-6.0

Pre-installed in a Template: ☐

Properties

Property Name	Description	Type	Value	Auto-Bind T...	Auto-Bind Tags	Required	Secured	Overrid...
dbsnmp_password	Password for DBSNMP user	String		None		✓	✓	✓
oracle_password	Password for Oracle user	String		None		✓	✓	✓
oracle_version	Oracle Version	Single Select	12c	None		✓	N/A	✓
local_management	Specify whether to configure D...	Single Select	true	None		✓	N/A	✓
selected_language	Specify the languages in whic...	Single Select	English	None		✓	N/A	✓
oracle_base	Specify the complete path of th...	String	/u01/app/oracle	None		✓	N/A	✓
install_edition	Specify the installation edition	Single Select	Enterprise Edition	None		✓	N/A	✓

ACTIONS

Lifecycle Stage	Script Type	Script	Reboot
INSTALL	Bash Script	#!/bin/bash # import global conf. \$global_conf # ----- # The	
CONFIGURE	Bash Script	#!/bin/bash # import global conf. \$global_conf ***** GLOBAL VARIABLES ***** # Record the database in...	
START	Bash Script		
UPDATE	Bash Script	#!/bin/bash # import global conf. \$global_conf ***** GLOBAL VARIABLES ***** # Record the database in...	
ROLLBACK	Bash Script	#!/bin/bash # import global conf. \$global_conf ***** GLOBAL VARIABLES ***** # Record the database in...	

What properties does a service require?

What does a service do when being Installed or Configured?

Enabling and Provisioning Oracle DBaaS

vRealize Automation Application Services – Deployment Profile

Oracle DBaaS

Step 1: Deployment Environment

Step 2: Application Properties

Step 3: Execution Plan

Step 4: Review

▼ Deployment Environment

Name	Description	Cloud Provider
<input checked="" type="radio"/> Oracle-2 Tenant	Oracle-2 Tenant	ehc-cloud-vctr2-ora2

Map Details

▼ VM Templates

Node Name	Logical Template	Cloud Template
RHEL-64bit_v1.0	RHEL-64bit	RHEL65

▼ Networking

Logical Network Name	Nodes Using this Network	Cloud Network Name
Default Logical Network	RHEL-64bit_v1.0	Oracle 2

▼ Disks

Node Name	Disk Name	Tags	Storage
RHEL-64bit_v1.0	Disk0	Data	Oracle_DATA
RHEL-64bit_v1.0	Disk3	Log	Oracle_LOG
RHEL-64bit_v1.0	Disk2	Archive	Oracle_FRA
RHEL-64bit_v1.0	Disk1	Binary	Oracle_BINARY

Oracle DBaaS - Day 2 Operations

The screenshot displays the Oracle DBaaS management console. The top navigation bar includes links for Home, Catalog, Items, Requests, Inbox, Advanced Services, Administration, and Infrastructure. The 'Items' tab is selected, and the breadcrumb trail shows 'You are here: Items > Machines'. The main heading is 'Machines'. Below it, a message states: 'Select an item type from the menu on the left to view your provisioned items. Use the Actions menu to manage your items.' On the left, a sidebar menu has 'Application Deployment' and 'Machines' (selected). The main content area shows a table with one item: 'FEHC3-Ora30068' with description 'vcaci://6c3b68'. An 'Actions' dropdown menu is open over the table, listing various management tasks. Some tasks are marked with a red asterisk (*), indicating they are unavailable or in progress. The table also shows 'Cost to Date' as '\$0.00' and 'Status' as 'On'. The bottom of the page shows a pagination bar with 'Page 1 of 1'.

Name	Description	Cost to Date	Status
FEHC3-Ora30068	vcaci://6c3b68	\$0.00	On

- Add Memory *
- Add OEM 12c Agent *
- Add vCPU *
- Backup Database *
- Change Lease
- Configure Database Backup *
- Connect by Using RDP
- Destroy
- Expire
- Get Job Status
- Install Tools
- Power Cycle
- Power Off
- Reboot
- Reconfigure
- Remove Backup Service *
- Remove OEM 12c Agent *

Oracle DBaaS Day 2 Operations

Overview

Machine InformationStorageNetworkPropertiesSnapshots

Name: EHC3-Ora20054

Status: On

CPU: 2

Memory (MB): 8192

Storage (GB): 100

Description: `vmac://83b1c3ee-d2ee-4a16-b760-afc0a859f0df
/bf17becb-c638-4cc7-a254-b4c61461474b`

Owner: Administrator@ehc.ssev.local

Blueprint: RHEL64AR2

Compute resource: EHC3-Tenant

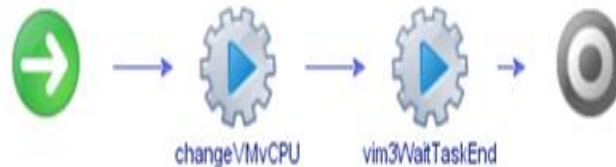
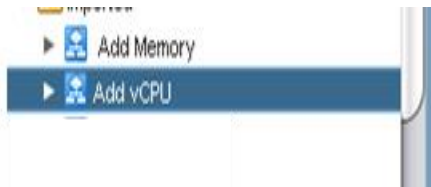
Business group: Oracle2-BG

Actions:

- Add Memory *
- Add OEM 12c Agent *
- Add vCPU *
- Backup Database *
- Configure Database ... *
- Destroy
- Expire
- Get Job Status
- Install Tools
- Power Cycle
- Power Off
- Reboot
- Reconfigure
- Remove Backup Serv... *
- Remove OEM 12c Ag... *
- Restore Database *
- Shutdown

Oracle DBaaS Day 2 Operations

Add vCPU to a virtual machine



New Request



Add vCPU
Increase the vCPU count of a virtual machine.

Request Information Input

* New vCPU count:

☐ 2

☐ 4

☐ 6

☐ 8

Save < Back Submit Cancel

Oracle DBaaS Day 2 Operations

Add memory to a virtual machine



New Request



Add Memory

Increase the vCPU count of a virtual machine.

Request Information Input

New memory size:

- ☐ 8 GB
- ☐ 10 GB
- ☒ 12 GB
- ☐ 16 GB
- ☐ 20 GB
- ☐ 24 GB
- ☐ 28 GB
- ☐ 32 GB

Save < Back Submit Cancel

Oracle DBaaS Day 2 Operations

Add/Remove Oracle DBaaS Backup

Machines

Select an item type from the menu on the left to view your provisioned items

The screenshot displays the Oracle DBaaS console interface. At the top, there are tabs for 'View Details', 'View Components', and 'Actions'. Below these, a table lists machines, with 'EHC3-Ora20054' selected. To the right of the table, an 'Actions' dropdown menu is open, showing various operations. The 'Configure Database Backup' option is highlighted with a red box. Below the table, a 'Configure Database Backup' workflow diagram is shown, also highlighted with a red box. The workflow consists of three steps: a green arrow icon, a blue icon representing 'Client Onboarding', and a black disk icon. A progress bar at the end of the workflow shows '100 %'.

View Details View Components Actions

Name	Details
EHC3-Ora20054	

Backup Database
Configure Database Backup
Destroy
Expire
Install Tools
Power Cycle
Power Off
Reboot
Reconfigure
Remove Backup Service
Restore Database
Shutdown

Configure Database Backup

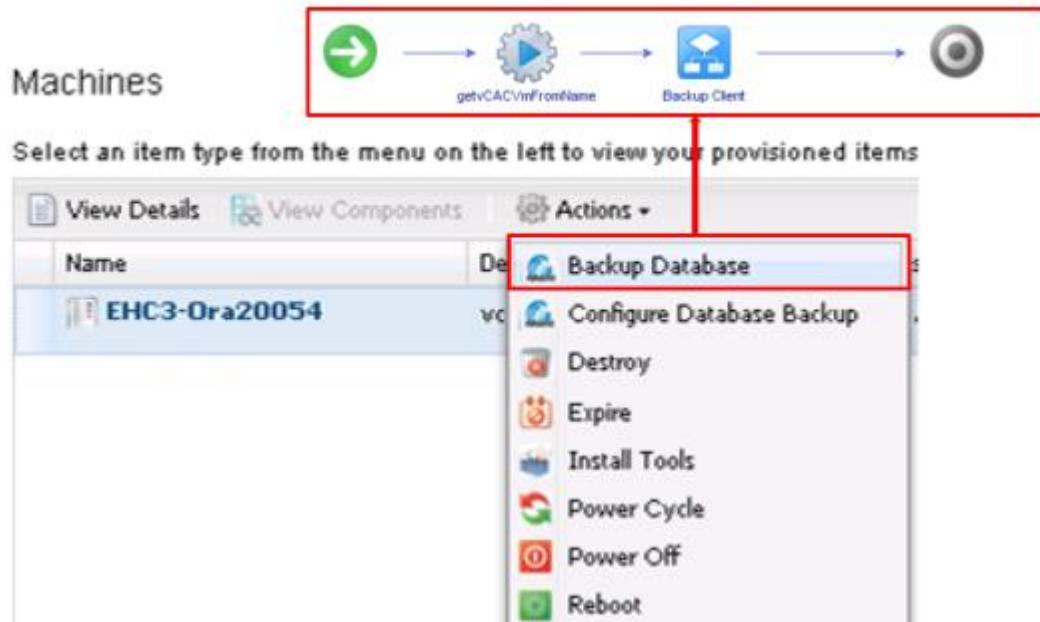
Workflow Tokens Events Permissions

100 %

Client Onboarding

Oracle DBaaS Backup and Recovery

On-Demand Backup as a Resource Action



Oracle DBaaS Backup and Recovery

Machines

Select an item type from the menu on the left to view your provisioned items

The screenshot shows the Oracle DBaaS console interface. At the top, there are tabs for 'View Details', 'View Components', and 'Actions'. Below these is a table with columns 'Name' and 'Details'. The table contains one entry: 'EHC3-Ora20054'. To the right of the table, the 'Actions' menu is open, displaying a list of actions: 'Backup Database', 'Configure Database Backup', 'Destroy', 'Expire', 'Install Tools', 'Power Cycle', 'Power Off', 'Reboot', 'Reconfigure', 'Remove Backup Service', 'Restore Database', and 'Shutdown'. The 'Restore Database' option is highlighted with a red box and has a red asterisk next to it. Below the table, there is a workflow diagram showing a sequence of steps: a green circle with a right arrow, followed by a blue square with a server icon labeled 'Restore Client', followed by a grey circle with a right arrow.

Oracle DBaaS Backup and Recovery

Restore Oracle database forms

Request Information

Step

❓ * Enter the oracle user password:

.....

❓ Select Backup:

2015-07-01T00:01:38.000-... ▼

❓ Restore to Remote Host?:

Yes ▼

❓ Restore to Host:

▼

EHC3-Ora20048
EHC3-Ora20060
EHC3-Ora20049
EHC3-Ora20054
EHC3-Ora20036
EHC3-Ora20023

Monitoring Oracle DBaaS

Oracle Enterprise Manager Cloud Control 12c monitoring

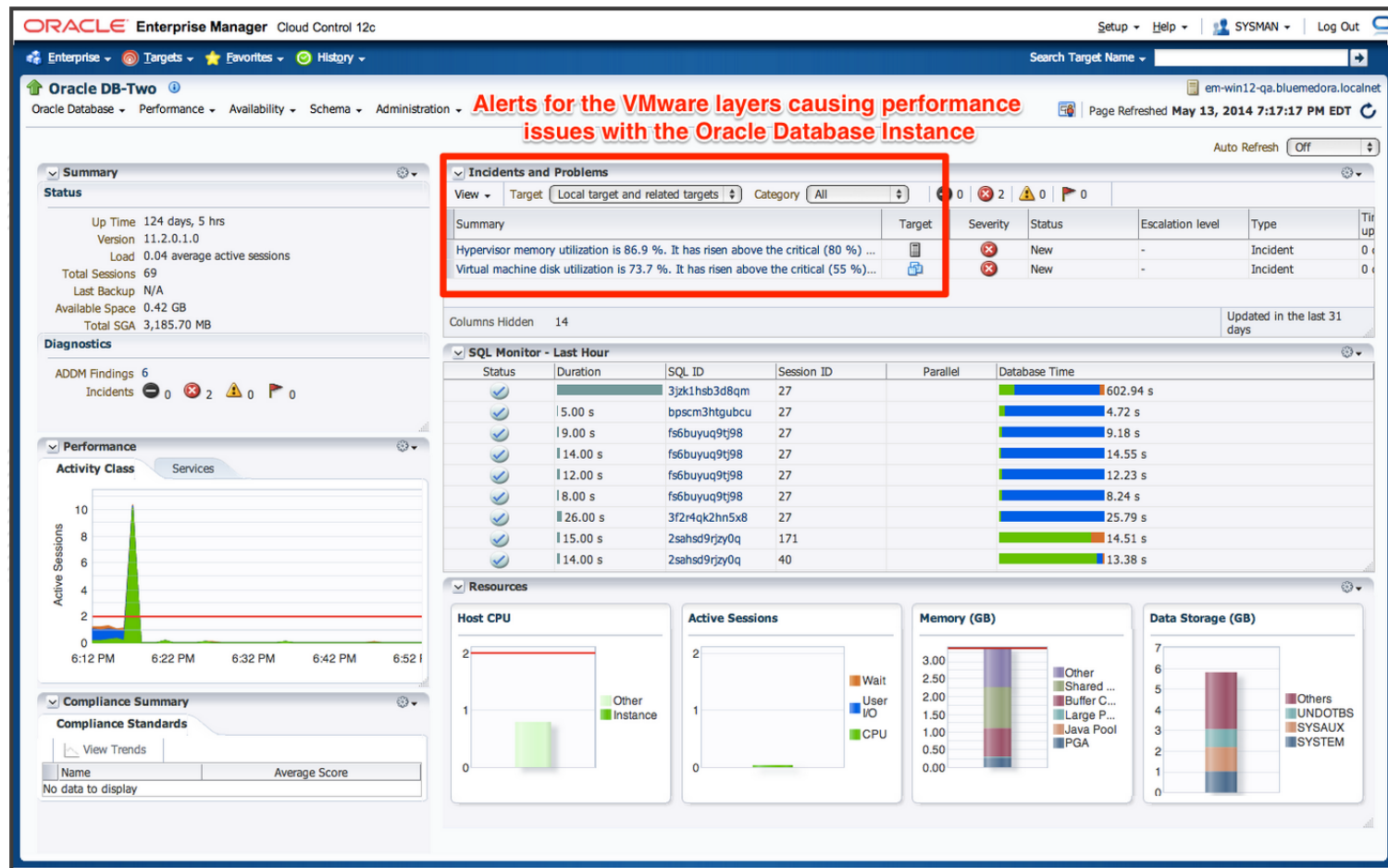
The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface. The main window shows the 'Summary' tab for the target 'Ora12c-YCLWIHT3.epc.ssev.local'. The 'Status' section indicates the target is 'UP'. The 'Diagnostics' section shows 'Incidents', 'Configuration Changes', and 'Critical Patch Advisories'. The 'Configuration' section provides details about the target's IP address, operating system, file system, memory, and address. The 'Model' section shows the target is a 'Model Name: 12c_54' with 'CPU Implementation: Intel(R) Xeon(R) CPU E5-2690 v2 @ 3.00GHz'. The 'Virtual Processor' section shows 'Total vCPUs: 2'. The 'Job Activity' section shows a summary of jobs whose start date is within the last 7 days, with a search bar and a table of jobs.

Related Targets

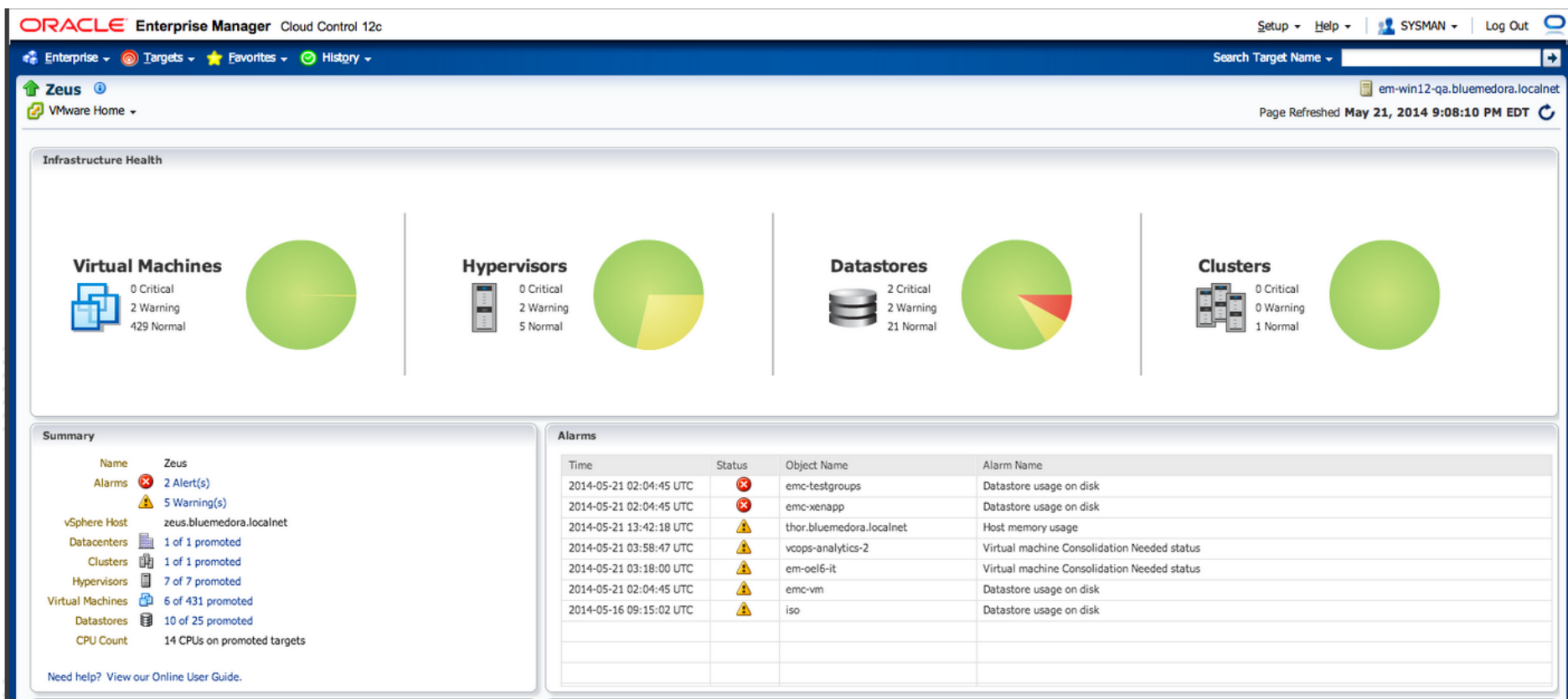
Select	Name	Installed location	Availability
<input type="checkbox"/>	Ora12c-YCLWIHT3.epc.ssev.local:3872	/home/oracle/agent/core/12.1.0.2.0	UP
<input type="checkbox"/>	orclpdb	/u01/app/oracle/product/12.1.0/db_1	UP
<input type="checkbox"/>	Ora12c-YCLWIHT3_LISTENER	/u01/app/oracle/product/12.1.0/db_1	UP
<input type="checkbox"/>	Oradb12Home1_1_Ora12c-YCLWIHT3	/u01/app/oracle/product/12.1.0/db_1	n/a
<input type="checkbox"/>	agent12c1_2_Ora12c-YCLWIHT3	/home/oracle/agent/core/12.1.0.2.0	n/a

12c

Extends Oracle Cloud to VMware – Performance View



Extends Oracle Cloud to VMware – VMware Status



EMC/Oracle Solutions Center

ORACLE

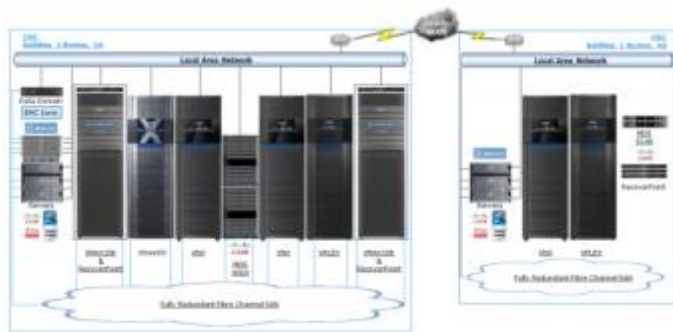


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 - EMC Demos
 - EMC POCs
- Oracle Integration Demos
 - Storage integration, cloning & replication
 - HA Stretched clusters
 - Management tooling



OSC Infrastructure

[Leverage EMC at Oracle Solution Centers](#)

EMC³

References

My Blog "Dirty Cache"

<http://bartsjerps.wordpress.com>

Everything Oracle @ EMC (community):

<http://emc.com/everythingoracle>

XtremIO

<http://xtremio.com/>



Dirty Cache

A storage infrastructure perspective on optimizing business applications

HOME

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[← Thank you, Larry Ellison](#)

Stop Idling – Start Saving

OCTOBER 23, 2012 [LEAVE A COMMENT](#)



One of my missions is to help customers saving money (Dirty **Cache** Cash). So considering the average enterprise application environment, I frequently ask them where they spend most of their IT budget on. Is it servers? Networks? Middleware? Applications?

Turns out that if you look at the operating cost of an Oracle database application, a very big portion of the **TCO** is in database licenses. Note that I focus on Oracle (that's my job) but for other databases the cost ratio might be similar. Or not. But it makes sense to look at Oracle as that is the most common platform for mission-critical applications. So let's look at a database environment and forget about the application for now.

Let's say that 50% of the operating cost of a database server is spent on Oracle licensing and maintenance



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