



Calgary **ORACLE**  
Users Group

# Oracle Engineered Systems: Your New *Time Machine*

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One Hundred Degrees of Separation

Presented: Calgary Oracle Users Group - 20 March, 2014



Calgary **ORACLE**  
Users Group

# What is the most valuable commodity in a DBA's day?

# Syllabus

---

- Other Activities
- Mandatory Disclaimer
- ODA: Oracle Database Appliance
- ZFS Storage Appliance
- OVM: Oracle Virtual Machine



 Oracle ACE Director



Consultant to Harvard University



University of Washington Oracle Instructor, ret.



The Morgan of Morgan's Library on the web



Board Member: Victoria and Vancouver OUGs

- Upcoming Presentations
  - Serbia Oracle Users Group
  - Oracle Users Group Finland
- Never worked for Oracle



- ♦ Oracle ACE Director
- Oracle University Instructor
- Oracle Instructor of the Year, 2010
- More than 40 years in IT
- More than 30 years with Oracle technology
- More than 10 years teaching Oracle's products
- Internationally recognized conference speaker  
(keynotes, classes, seminars, and panels)

# Syllabus

---

- Other Activities
- Mandatory Disclaimer
- ODA: Oracle Database Appliance
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- OVM: Oracle Virtual Machine



# Other Activities

events.oracle.com/search/search?group=Events&keyword=

DuckDuckGo Google Email Humor News Oracle Rolta Science Headlines

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ORACLE  
PARTNER NETWORK

# Syllabus

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- Other Activities
- Mandatory Disclaimer
- ODA: Oracle Database Appliance
- ZFS Storage Appliance
- OVM: Oracle Virtual Machine



# Disclaimer \*

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- This room is an unsafe harbour
- We are not subject to any NDA
- No one from Oracle has previewed this presentation
- No one from Oracle knows what we are going to say
- No one from Oracle has supplied any of our materials
- This presentation is about released products, currently available, that work extremely well
- What we are going to emphasize today are those things you need to know to move your career and your organization forward
- You may rely upon this presentation to make decisions for yourself and your enterprise
- Oracle Corp. is not responsible for anything we say

# Syllabus

---

- Other Activities
- Mandatory Disclaimer
- ODA: Oracle Database Appliance
- ZFS Storage Appliance
- OVM: Oracle Virtual Machine



---

I'm supposed to talk about the ODA  
(Oracle Database Appliance)  
but let's talk about something  
equally important first

# What DBAs Do

---

- Manage databases
  - deploy them
  - patch them
  - upgrade them
  - secure them
  - performance tune them
  - troubleshoot them
- Confronted by any Oracle database we can always find something about it that can be improved. Especially if someone else was managing it before us
- Would anyone in this room want to have their databases graded by Jonathan Lewis, Alex Gorbachev, Tanel Poder?
  - I wouldn't!

# The Great Switch Fiasco

---

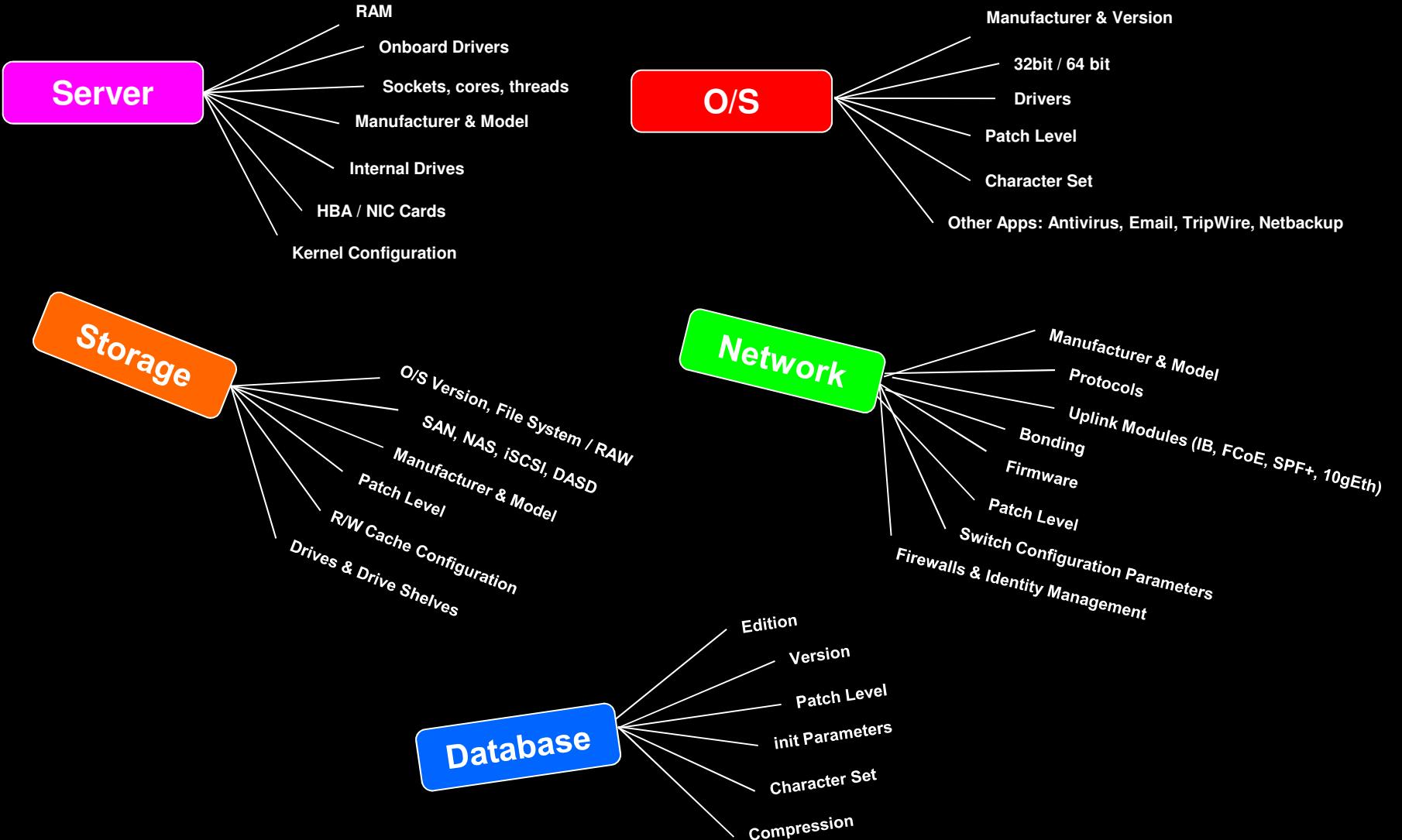
- The environment: RAC Cluster built with Sun M9000s
- At a major telecom where the network expertise is as good as it gets
- Application used to monitor network stability and real-time optimize call routing and performance
- Existing cluster interconnect is 10gEth, non-routable, jumbo frames, with dedicated Cisco 5010 switches
- New cluster interconnect is 10gEth, non-routable, jumbo frames, with dedicated Cisco 7010 switches
- What could possibly go wrong?
- And how much sleep would be lost in triage and implementing the fix?

## If ODAs had been installed

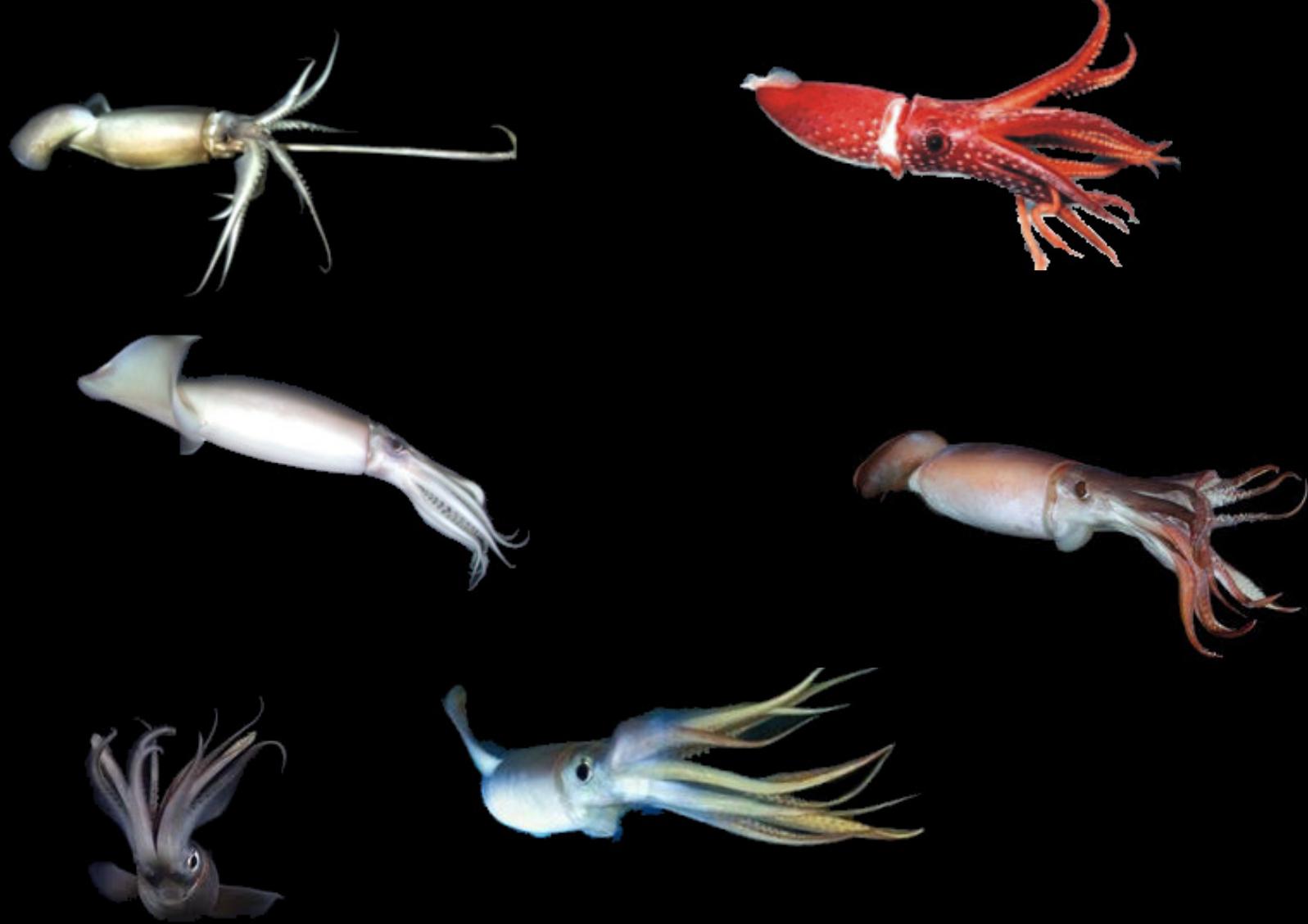
---

- Packet would not have been rejected
- No outage would have been required
- An SLA violation would not have occurred
- The customer would have been happy
- DBAs would have gotten to go home and sleep
- Many people: ops management, system admins, network admins, project managers, outage managers, Network Operations Center personnel, would not have spent countless hours on an outage bridge listening to support engineers from three different companies point fingers or ask for just one more system state dump

# Static Puzzle Pieces



# Animated Puzzle Pieces



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# It's hard to get your arms around a barrel of squid

---





# LONELINESS

IF YOU FIND YOURSELF STRUGGLING WITH LONELINESS, YOU'RE NOT ALONE.  
AND YET YOU ARE ALONE. SO VERY ALONE.

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# The Solution

make different, and better, decisions

# What is an ODA?

---

- Literally: An appliance
  - Though in 2010 we had to pay extra for the power cords
- First announced Sept 2011
  - Latest generation is X4
- Two node RAC cluster
  - 2 x Intel Xeon E5-2697 v2 12-core processors per node
  - 24 cores per node
  - 256 GB memory per node
  - 18TB double or triple mirrored ASM
  - 4 x 200GB SSD for redo logs
  - Redundant 10gEth internal interconnect
- Oracle Enterprise Linux 5.9



# Storage Expansion

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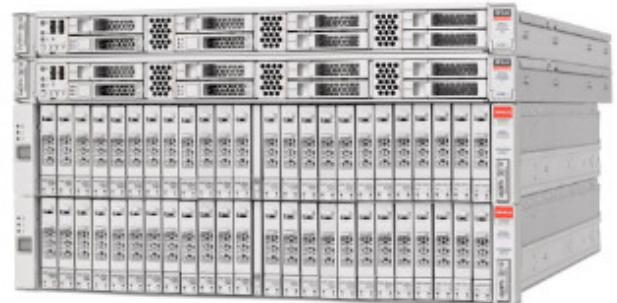
- Start with 18TB
  - Double or triple mirrored ASM
- Optionally add an additional
  - 18TB for a total of 36TB with an expansion shelf
  - Includes four additional 200GB SSDs
- Pay-as-you-grow
  - Storage
  - CPU
  - Enterprise Edition, RAC, and other licenses too



# Licensing Options

---

- Database
  - Enterprise Edition 11gR2
- High Availability
  - RAC
  - One Node: for "active-active"
  - Server failover: for "active-passive"



# Additional Value Adds

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- ZFS Storage Appliance
- OVM: Oracle Virtual Machine

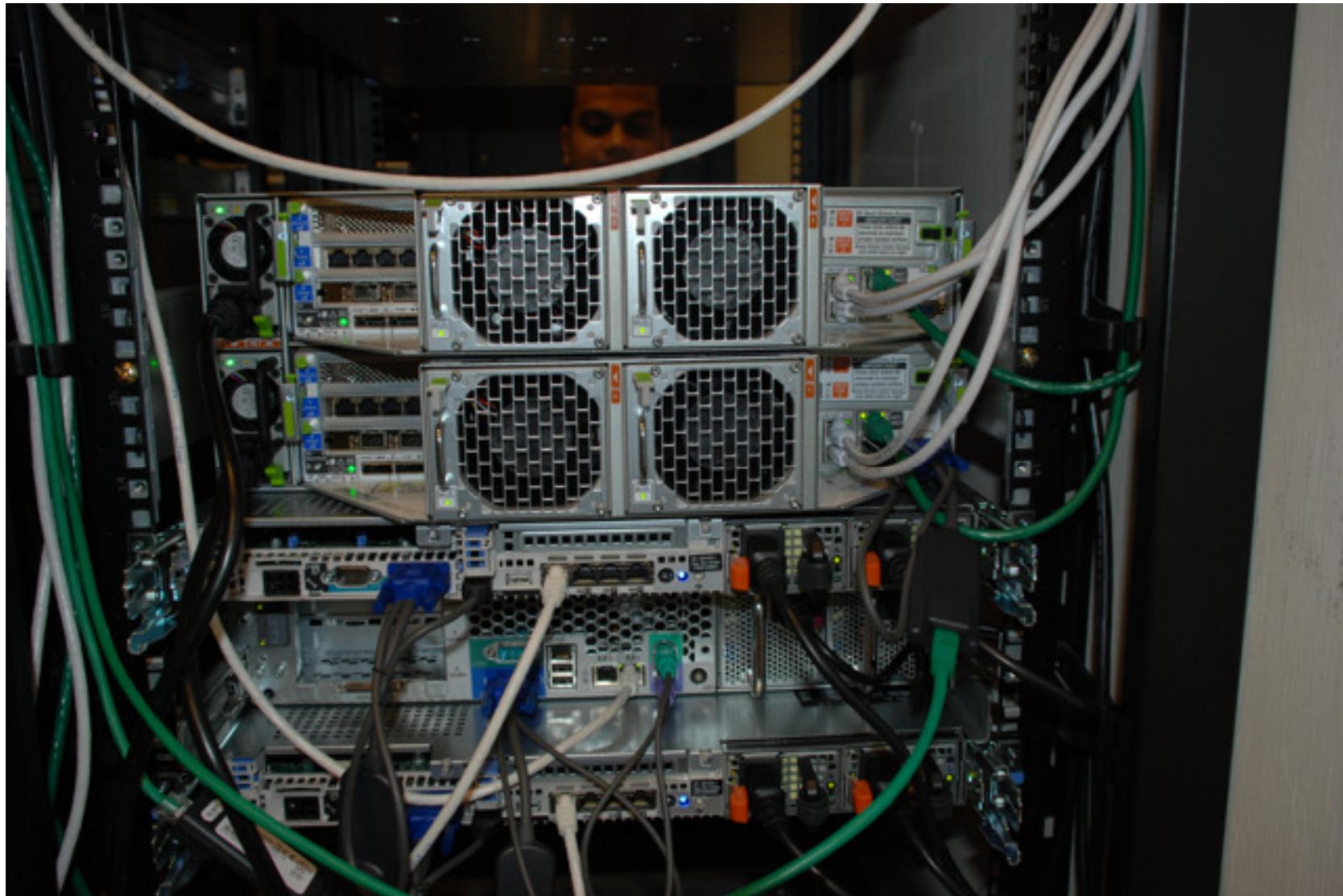
# ODA Front

---

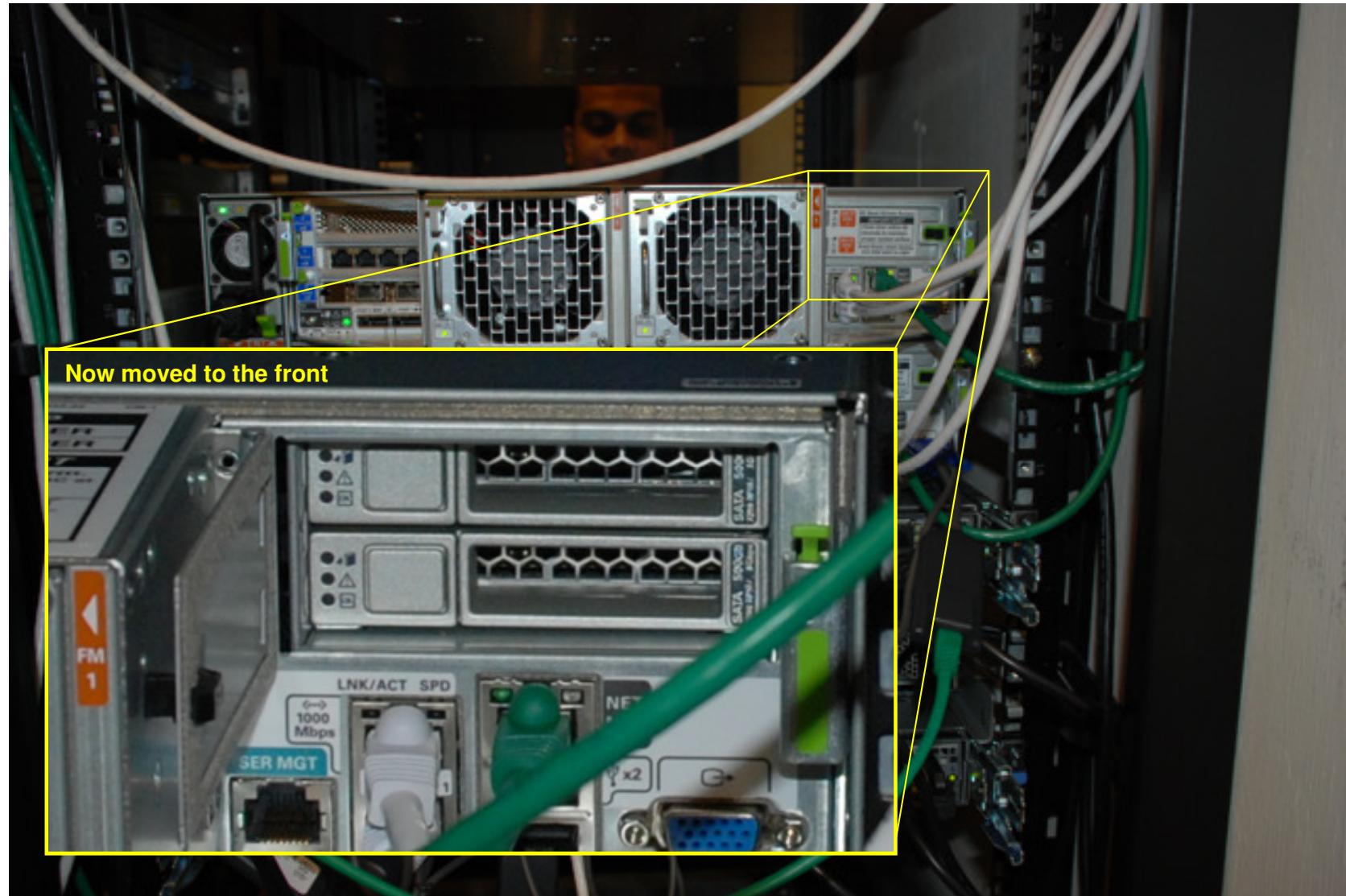


# ODA Back

---



# ODA Back



---

# Discussion

## Why an ODA?

# Why an ODA?

---

- Minimize complexity from rack-and-stack to full deployment
- Fast installation and configuration
- Ease of maintenance and patching
- Faster database performance than hardware not engineered for the Oracle database
- Stable

**... but the best reasons to deploy ODAs:**

**Freedom from System Admin tyranny!**

**Freedom from Network Admin indifference!**

**Freedom from the Storage Admin gulag!**

# But ODA's are not perfect

---

# Oracle didn't make them childproof

---



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# Discussion

## Installation

# Real World Deployments

- BC Hydro



Manitoba Oracle Users Group

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What We Do

- Education Seminars
- Technical Presentations
- Case Studies
- Hands-on Workshops
- Best Practice Symposiums
- Special Guest Lectures
- Networking Opportunities
- Social Events

Our Next Event

**Coming soon to Winnipeg, Manitoba**

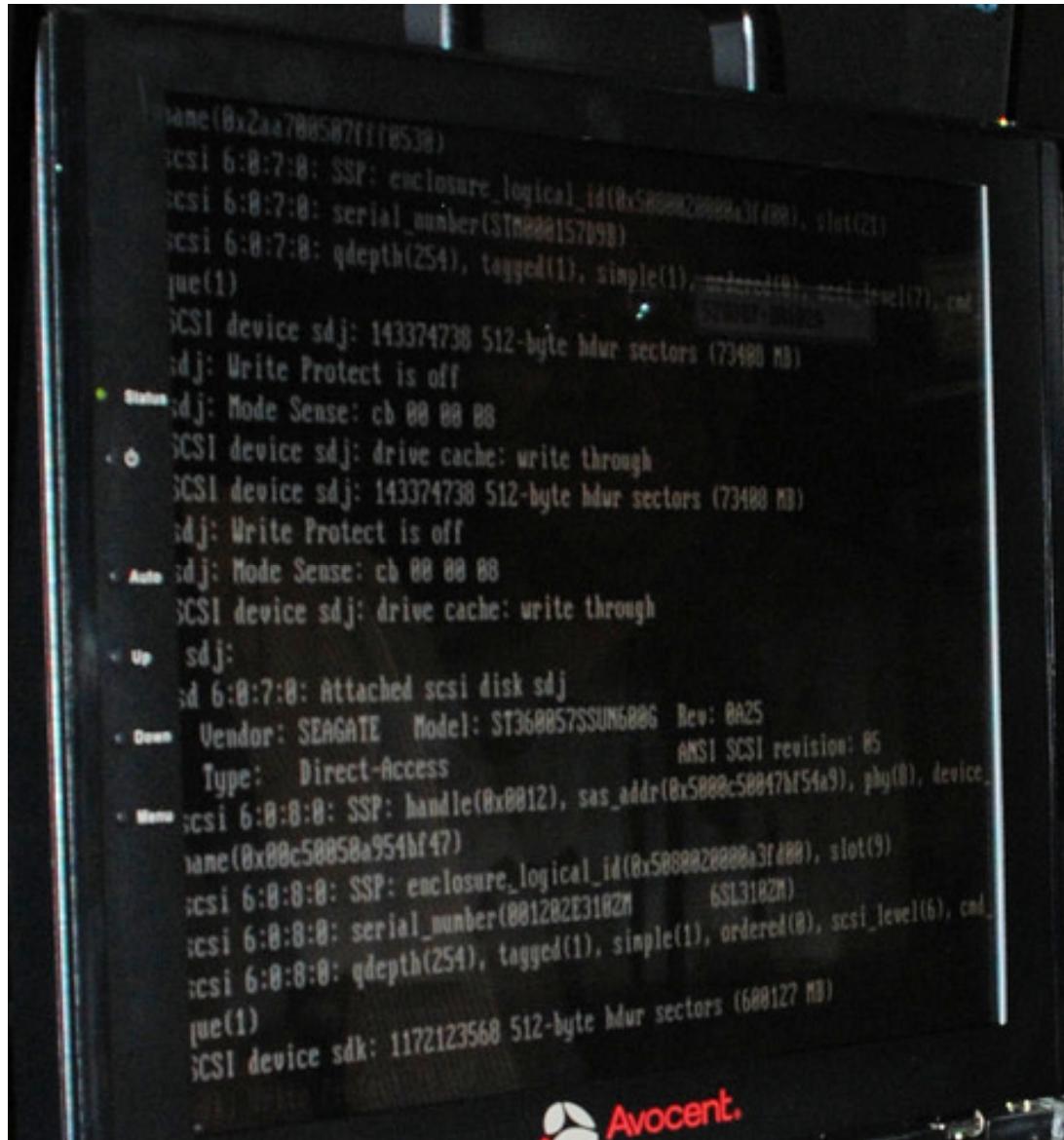
Two informative and entertaining presentations to launch the Manitoba Oracle Users Group

A great networking opportunity to meet your peers

Date to be announced  
5:00-8:00pm  
Location to be announced  
Light dinner included, come after work!

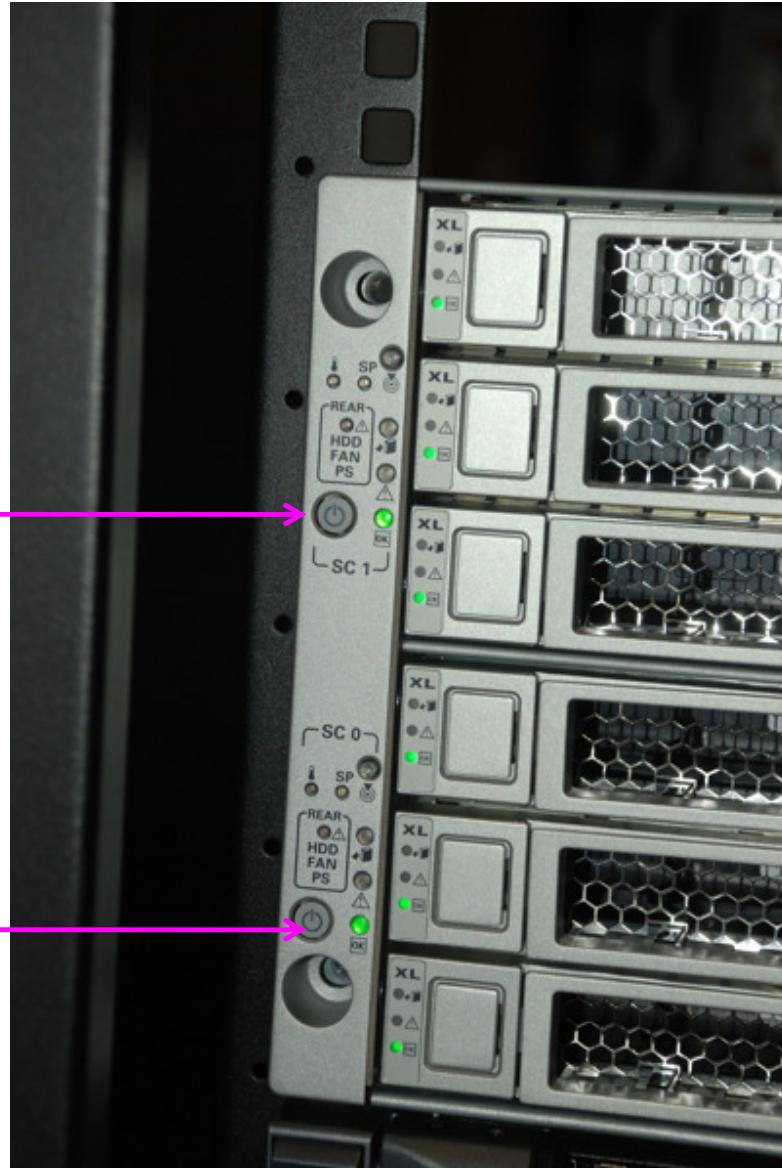
[Advance registration required](#)

# Step 1: Power On



# Step 2: Wait for OK Lights

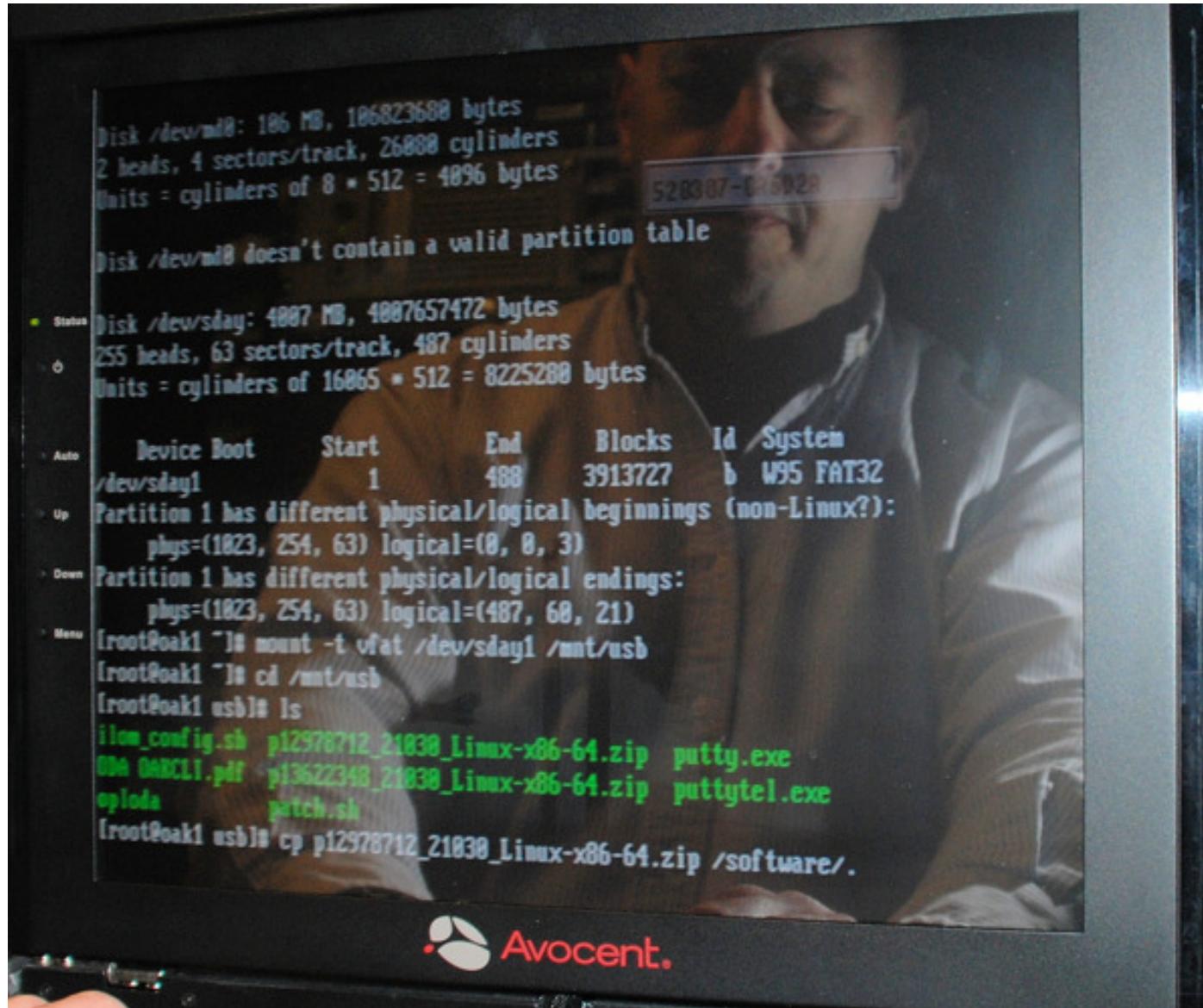
---



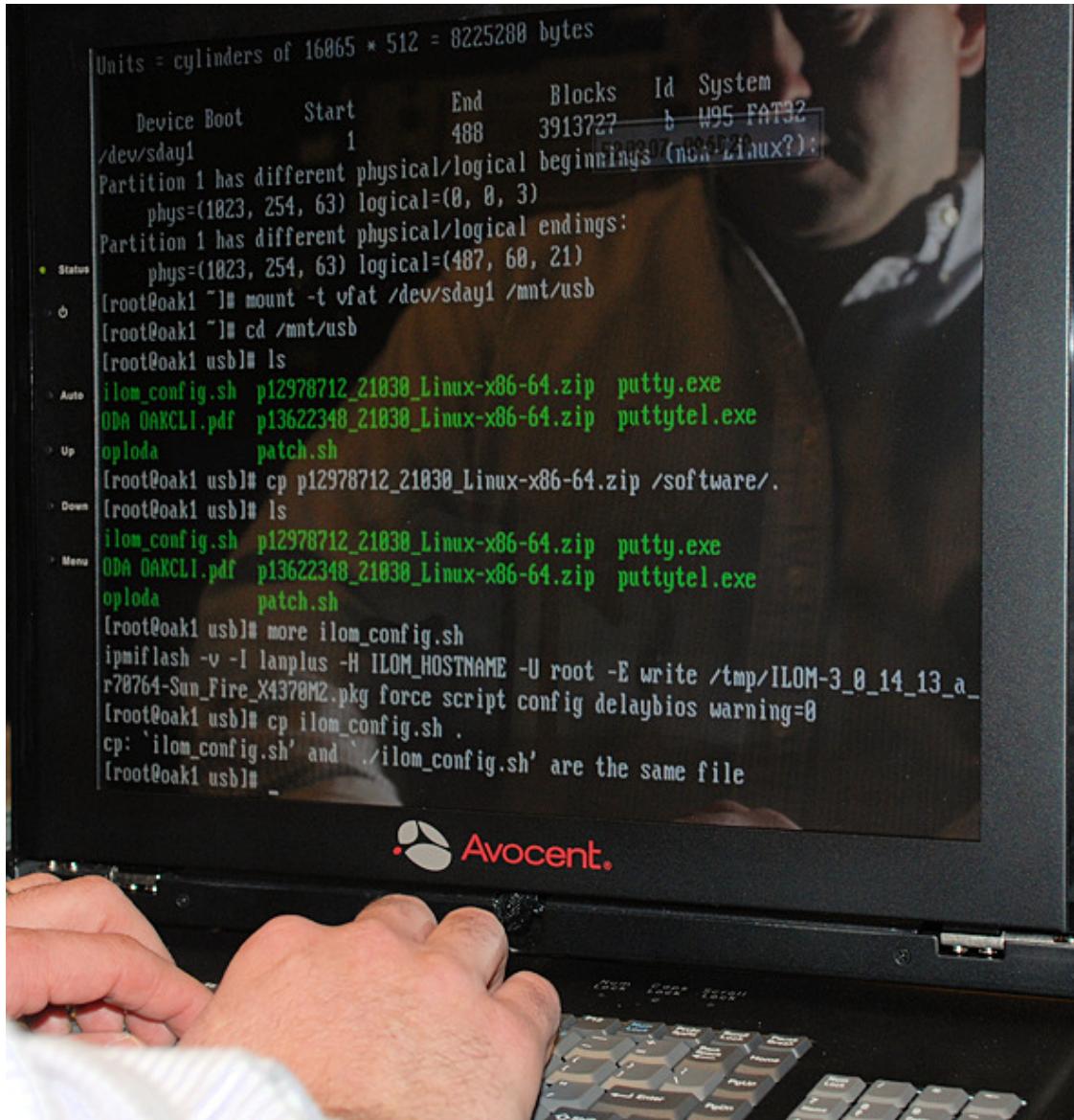
# Step 3: Log In as root



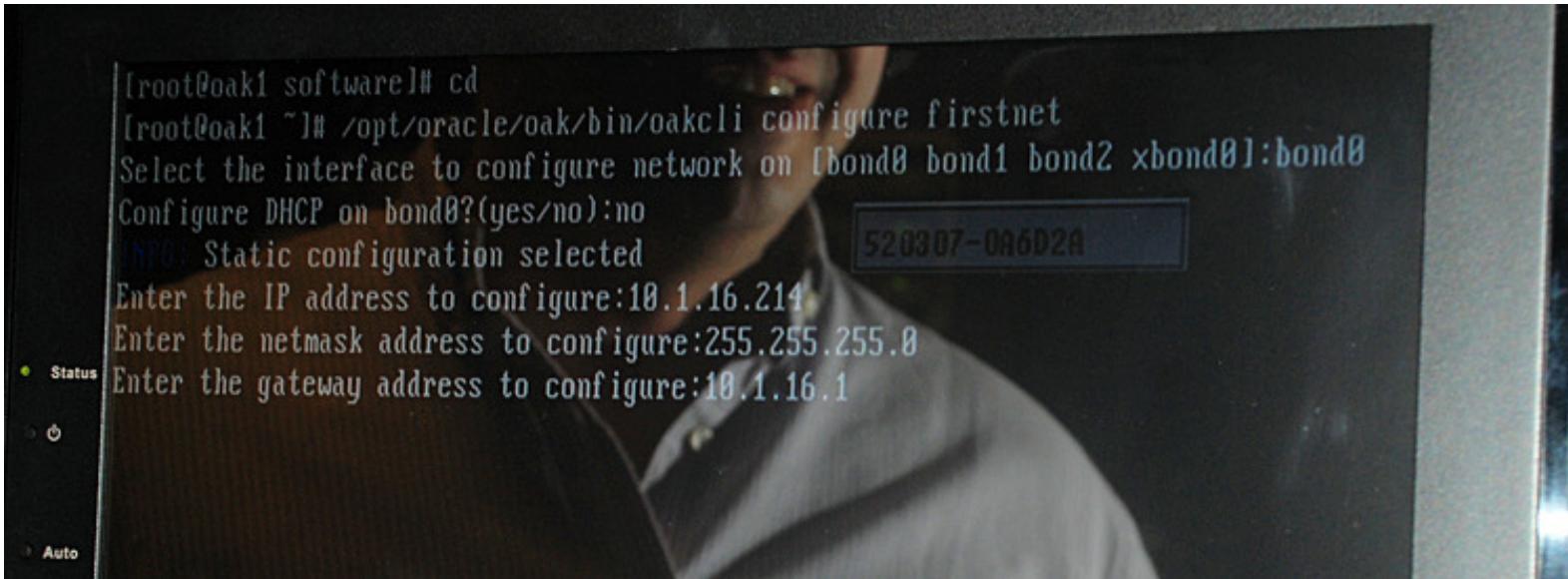
# Step 4: A little Linux Configuration



# Step 5: Perform ILOM Configuration



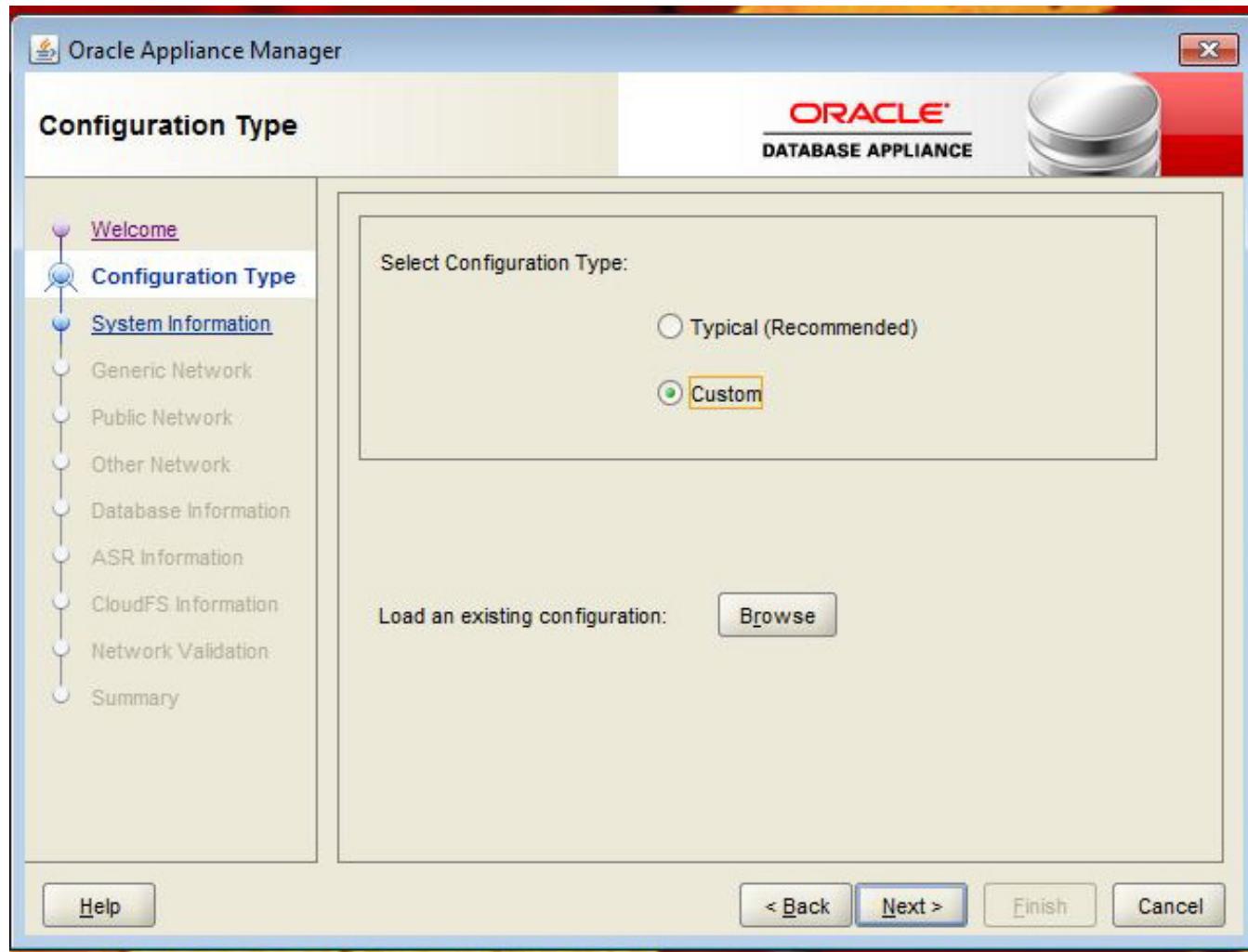
# Step 6: A Little Network Config



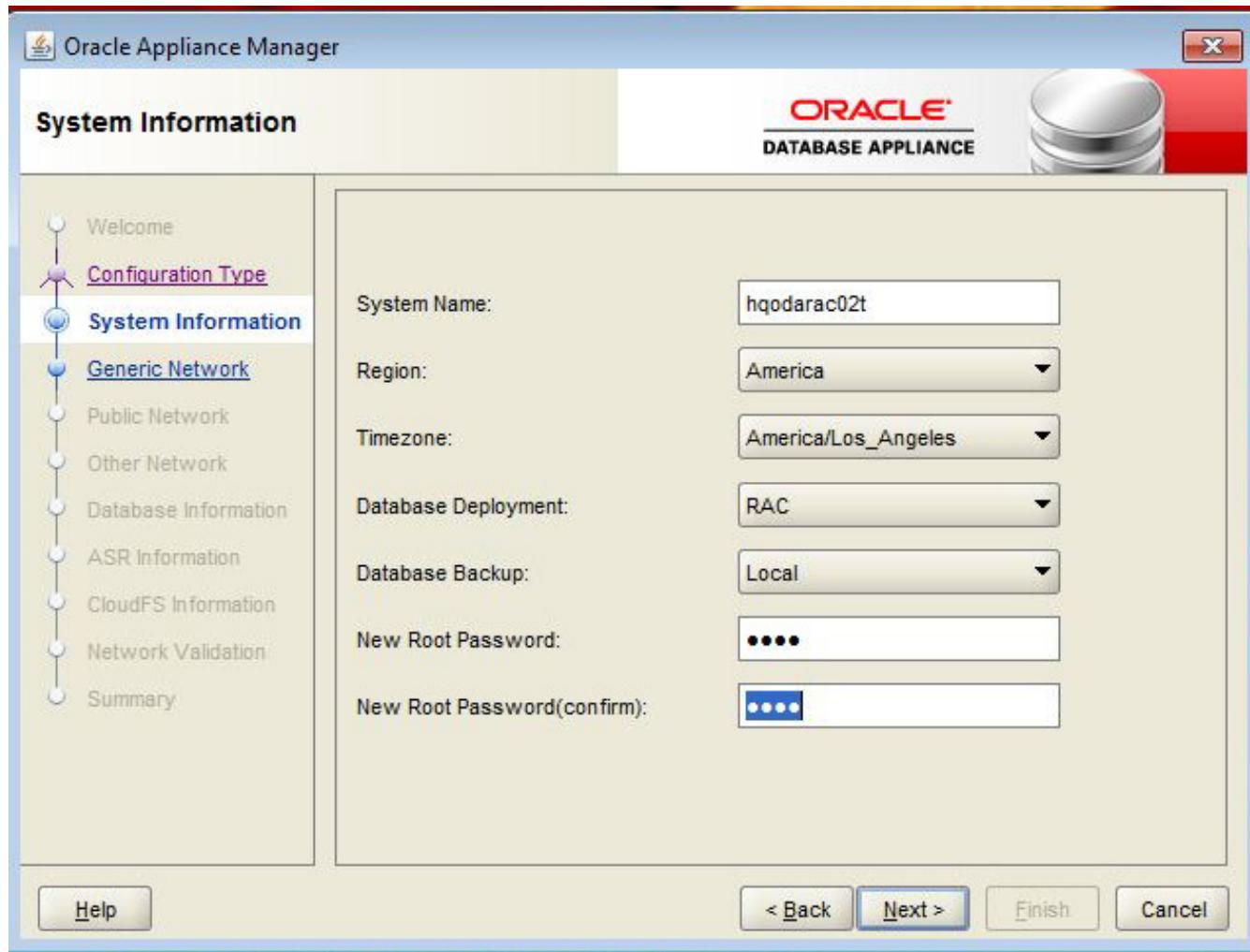
# Install Screens: 1



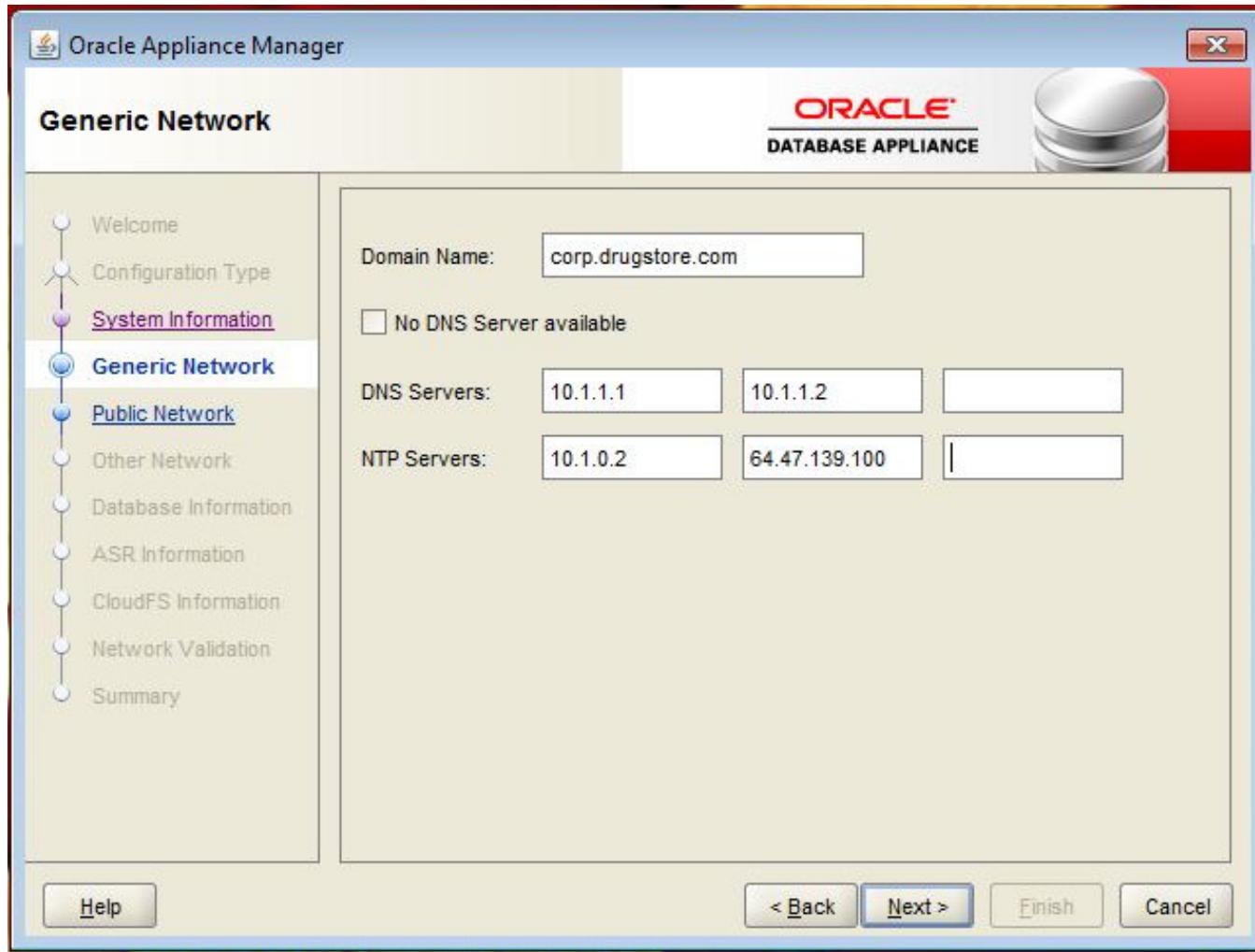
# Install Screens: 2



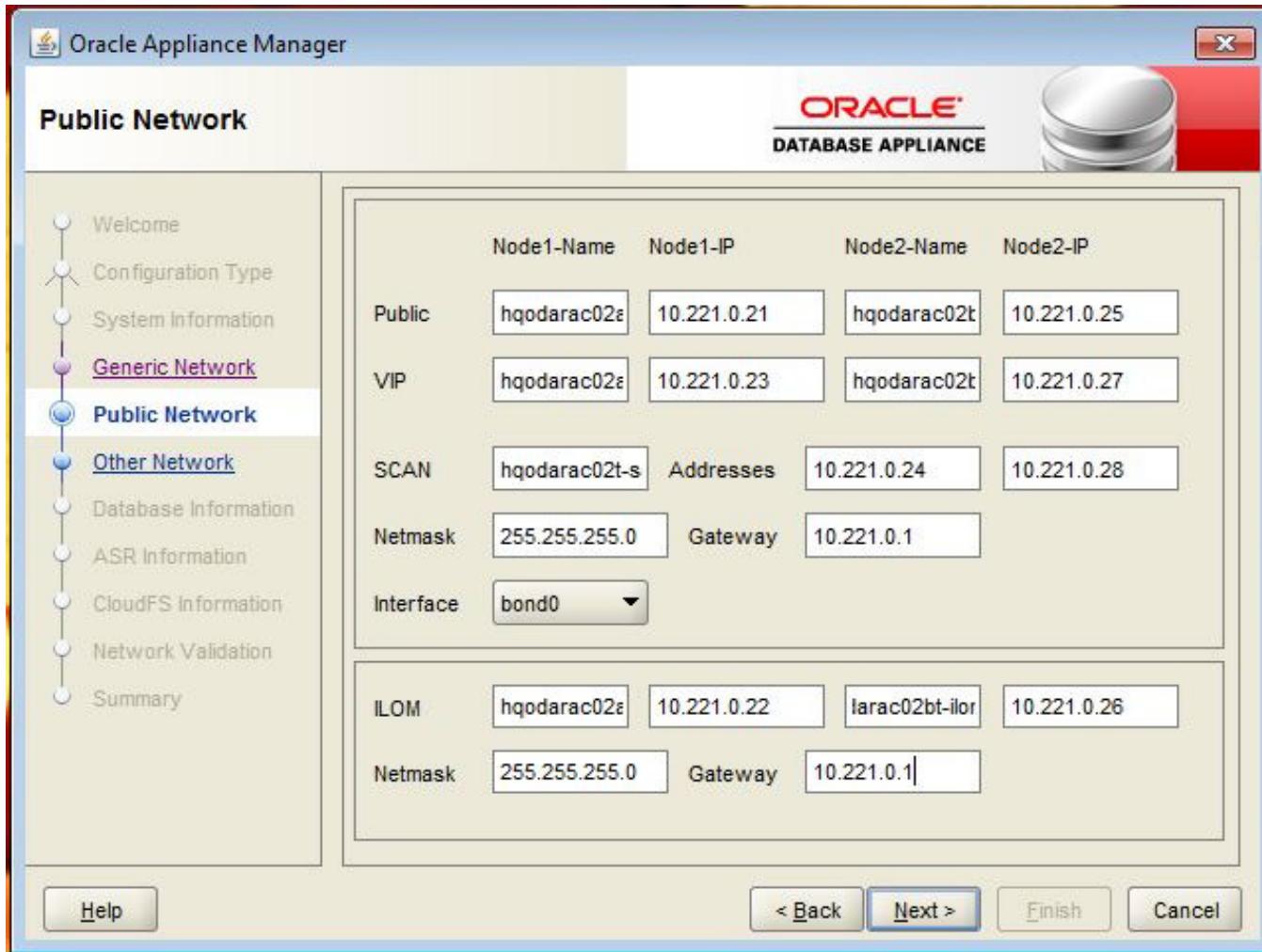
# Install Screens: 3



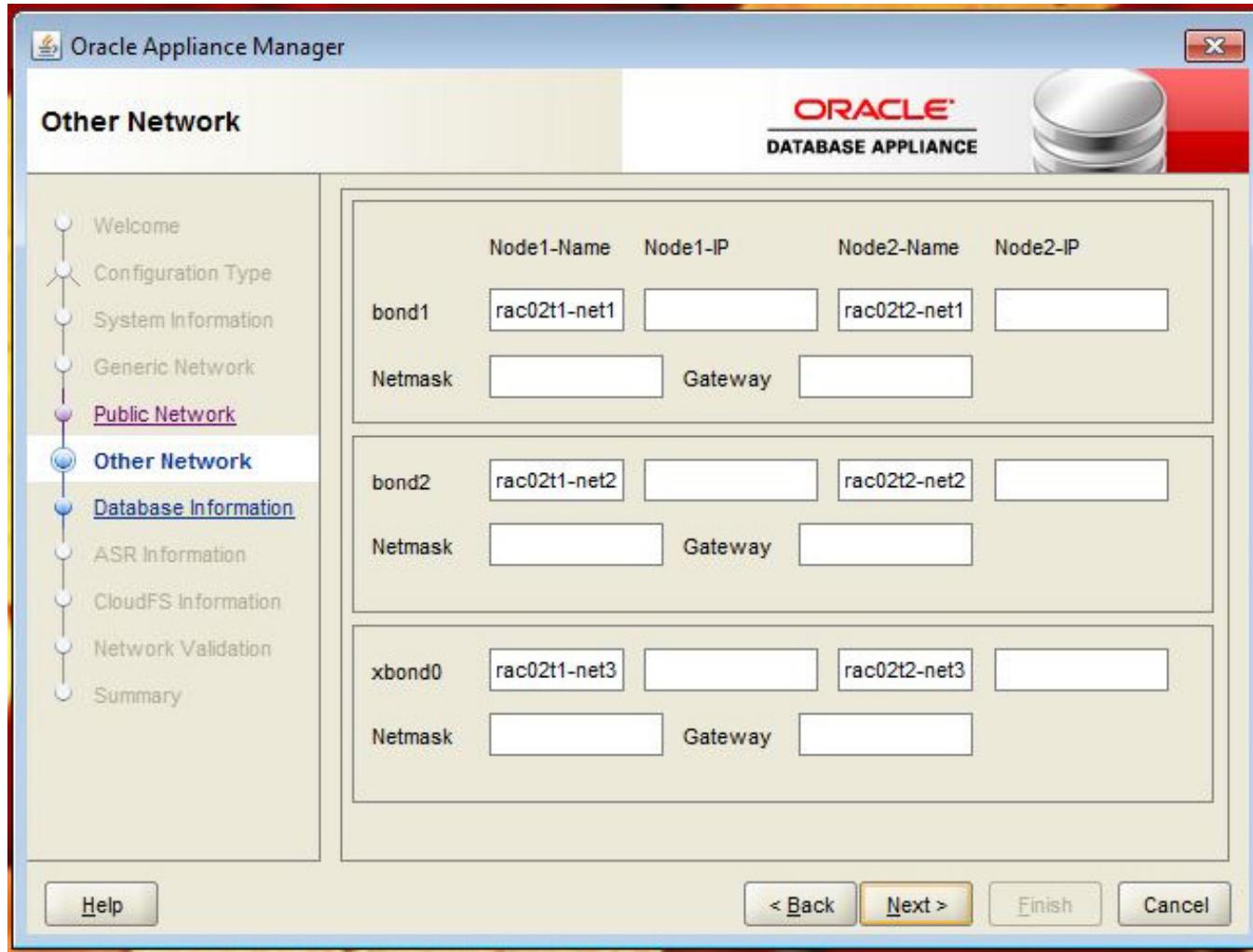
# Install Screens: 4



# Install Screens: 5



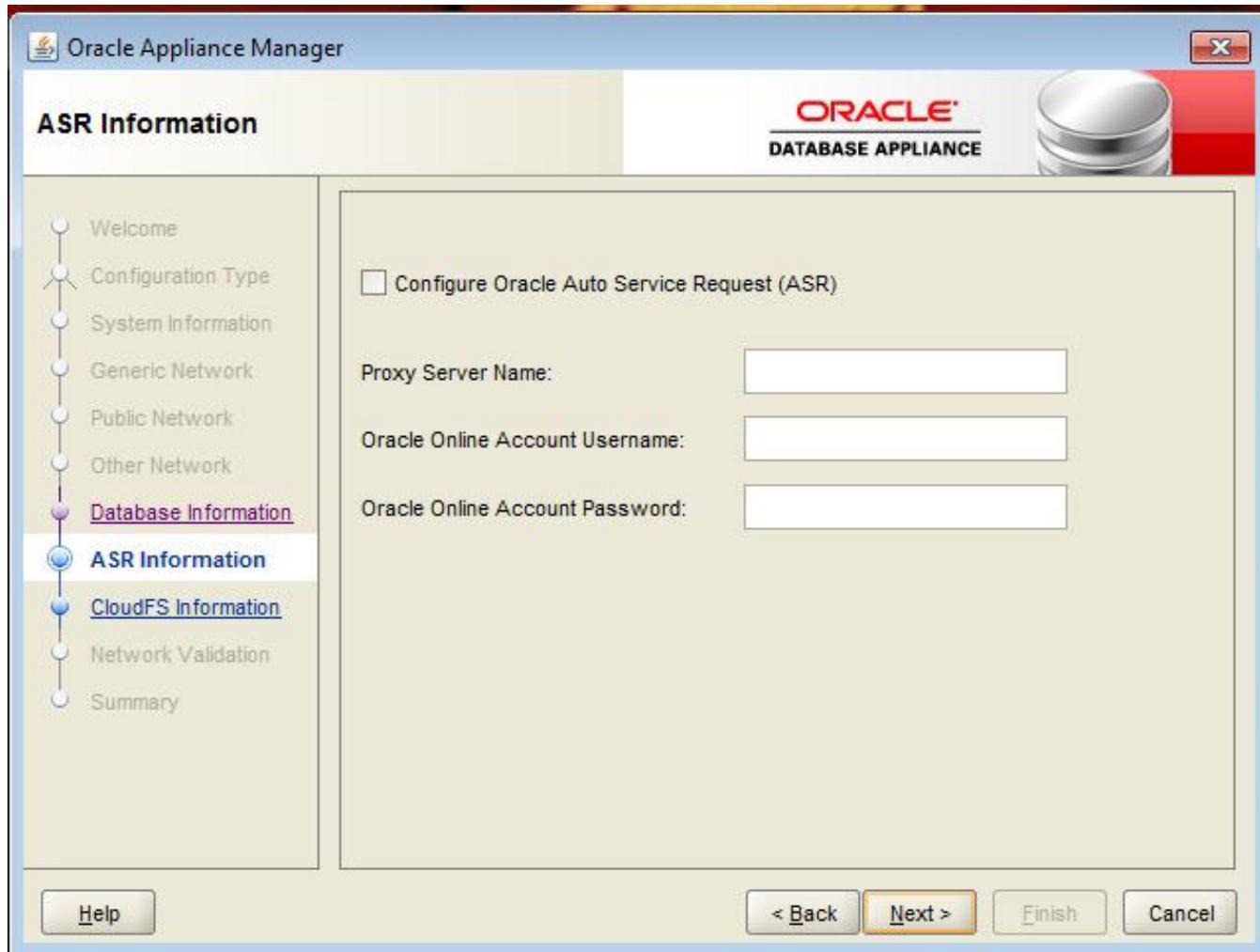
# Install Screens: 6



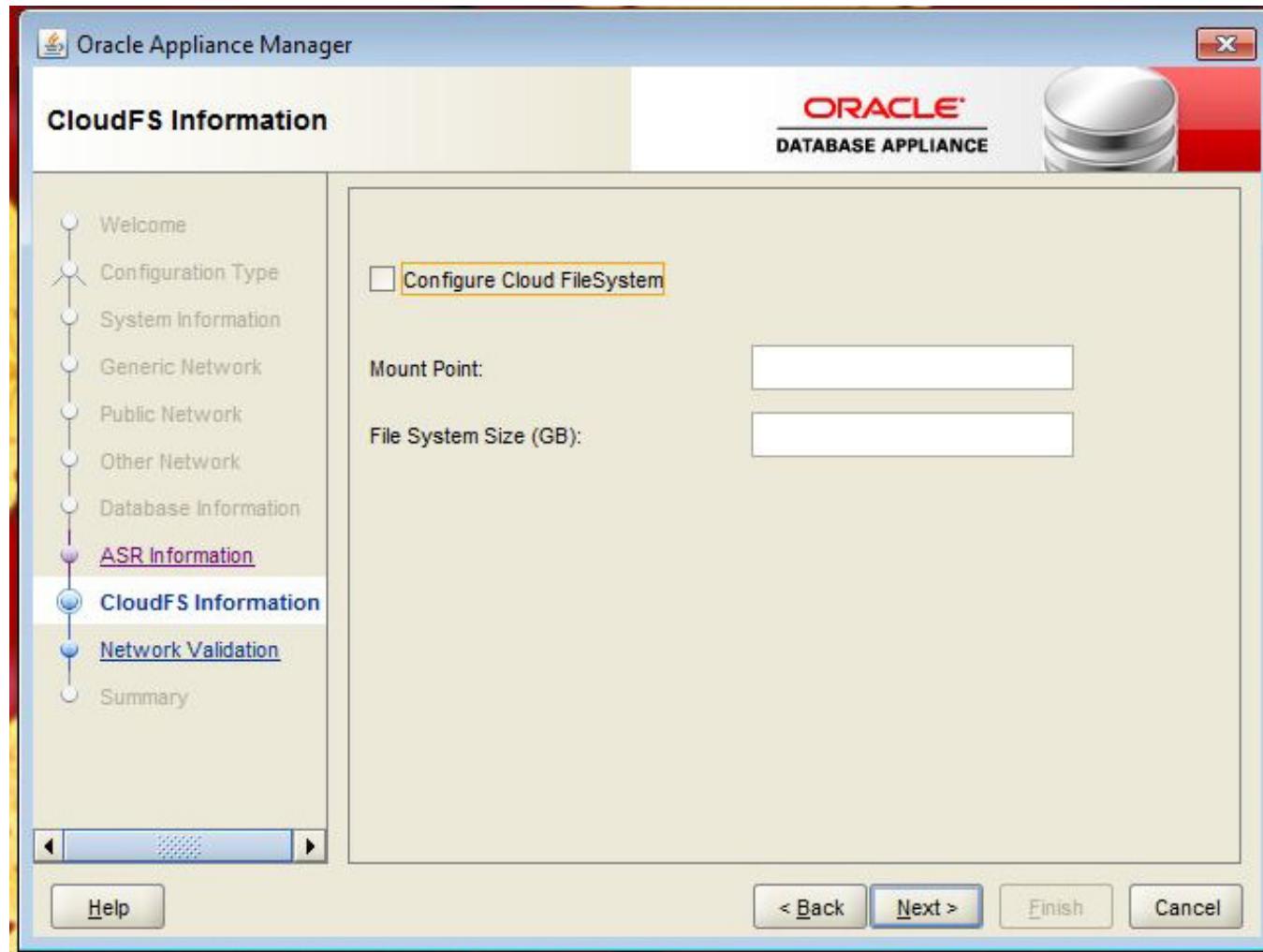
# Install Screens: 7



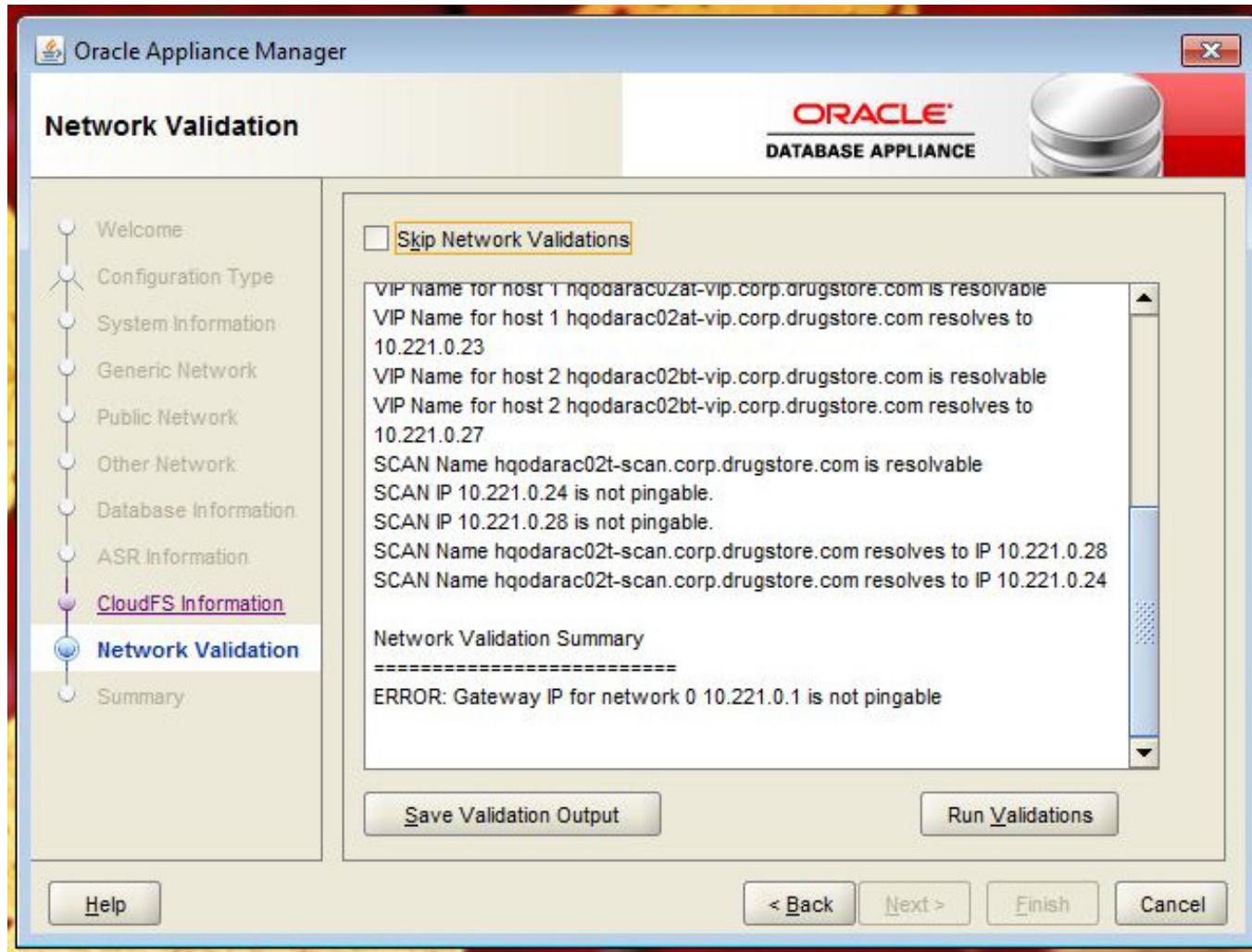
# Install Screens: 8



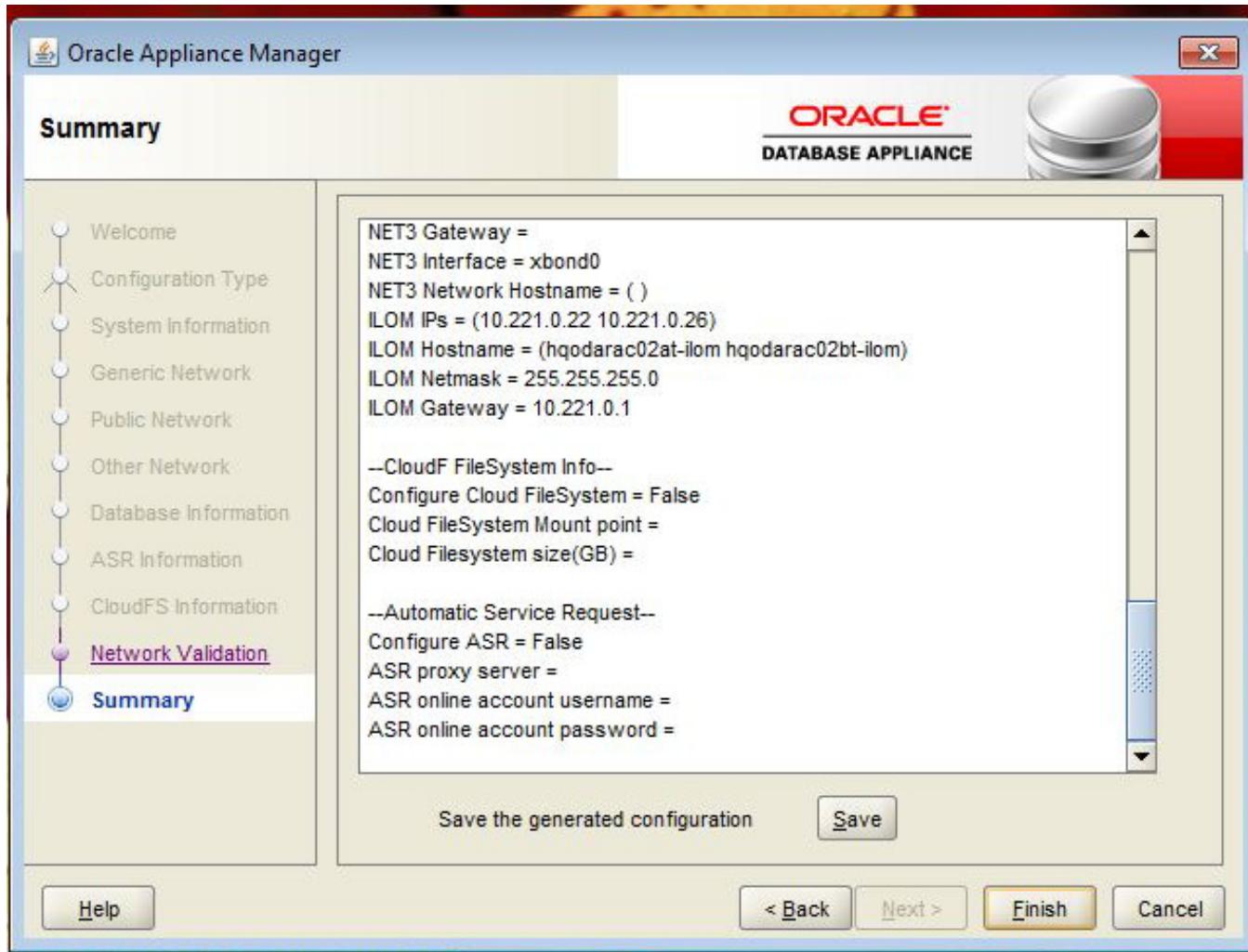
# Install Screens: 9



# Install Screens: 10



# Install Screens: 11



---

# Value Adds

## The ILOM

# System Information: System Information Overview

Oracle(R) Integrated Lights Out Manager - Windows Internet Explorer

https://hqodarac01atlom.corp.Cuglute.com/ILM/Pages/suntab.asp

Certificate Error

Favorites Suggested Sites Web Slice Gallery

Oracle(R) Integrated Lights Out Manager

ABOUT Warning

User: root Role: auro SP Hostname: hqodarac01atlom

REFRESH LOG OUT

Java

## Oracle® Integrated Lights Out Manager

System Information System Monitoring Power Management Storage Configuration User Management Remote Control Maintenance

Overview Components Fault Management Identification Information Banner Messages Session Timeout Versions

### System Overview

View system summary information. You may also change power state and view system status and fault information.

Product Name: SUN FIRE X4370 M2 SERVER

Part/Serial Number: 30480808-1+1 / 1207FMW00D

Host Power: On [Change](#)

System Status: Normal [View](#)

BIOS Version: 12010304

SP Hostname: hqodarac01atlom

Uptime: 70 days, 00:58:32

IP Address: 10.1.16.215

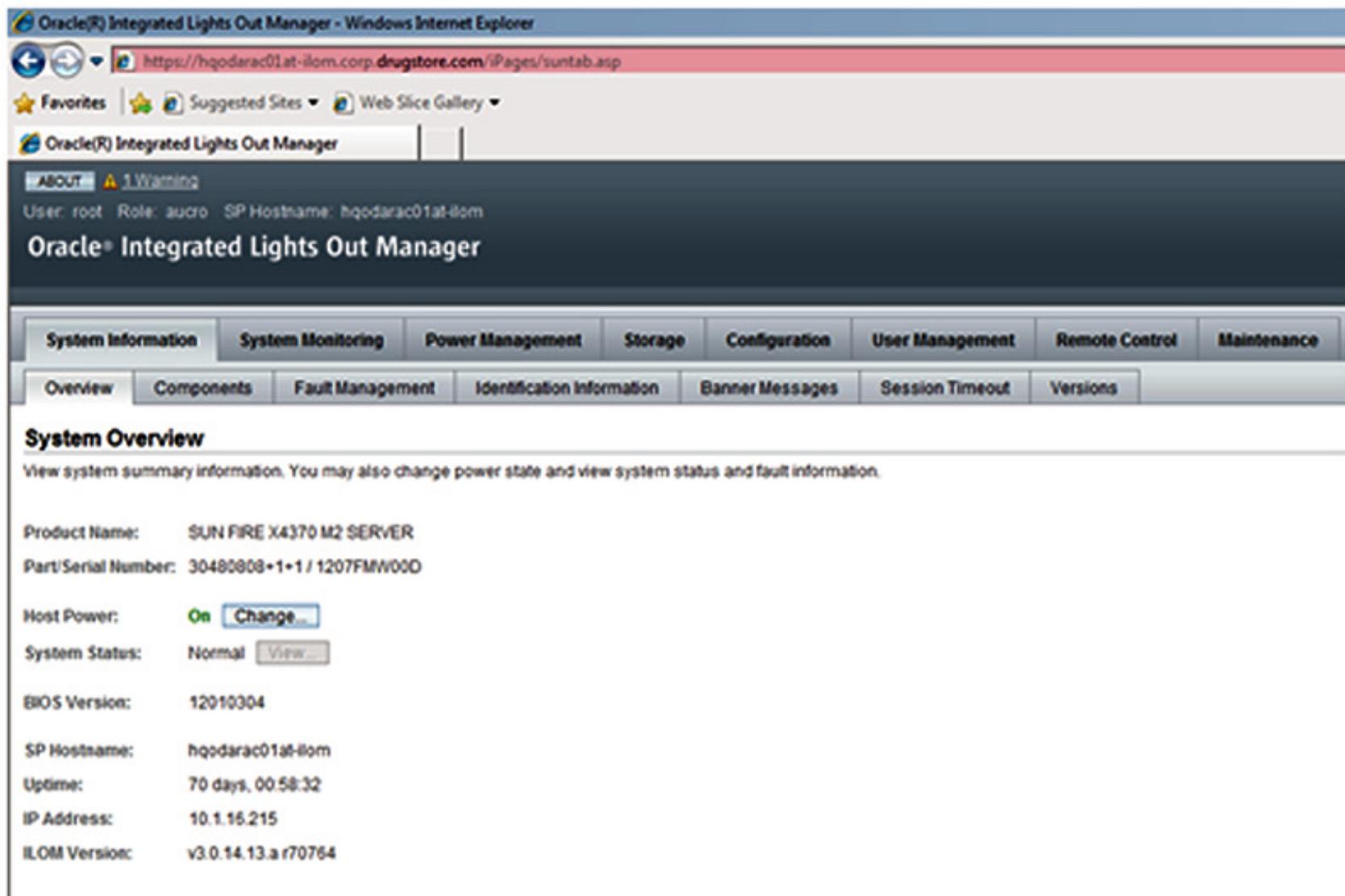
ILOM Version: v3.0.14.13.a.r70764

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# System Information: System Information Overview



The screenshot shows a web browser window for Oracle Integrated Lights Out Manager. The URL is <https://hqodarac01at-ilom.corp.drugstore.com/iPages/suntab.asp>. The page title is "Oracle® Integrated Lights Out Manager". The top navigation bar includes "Favorites", "Suggested Sites", "Web Slice Gallery", and the Oracle logo. Below the title, it shows "User: root Role: admin SP Hostname: hqodarac01at-ilom". The main menu has tabs for "System Information", "System Monitoring", "Power Management", "Storage", "Configuration", "User Management", "Remote Control", and "Maintenance". The "System Information" tab is selected, showing sub-tabs for "Overview", "Components", "Fault Management", "Identification Information", "Banner Messages", "Session Timeout", and "Versions". The "Overview" section is active, displaying system summary information. Key details include:

Product Name:	SUN FIRE X4370 M2 SERVER
Part/Serial Number:	30480808•1+1 / 1207FMW00D
Host Power:	On <a href="#">Change...</a>
System Status:	Normal <a href="#">VIEW...</a>
BIOS Version:	12010304
SP Hostname:	hqodarac01at-ilom
Uptime:	70 days, 00:58:32
IP Address:	10.1.16.215
ILOM Version:	v3.0.14.13.a r70764

# System Information: Component Management

**Component Management**

View component information, prepare to install or remove a component, or clear fault status from this page. To modify a component, select the radio button next to that component, then selected component and lights its blue *Ready to Remove* LED. To view further details, click on a Component Name.

**Component Status**

Component Name	Type	Fault Status
/SYS	Host System	OK
/SYSMB	Motherboard	OK
/SYSMB/BIOS	BIOS FRU	-
/SYSMB/CPLD	NVRAM	-
/SYSMB/NET0	Network Interface	OK
/SYSMB/NET1	Network Interface	OK
/SYSMB/NET2	Network Interface	OK
/SYSMB/NET3	Network Interface	OK
/SYSMB/P0	Host Processor	OK
/SYSMB/P0/D0	DIMM	OK
/SYSMB/P0/D1	DIMM	OK
/SYSMB/P0/D2	DIMM	OK
/SYSMB/P0/D3	DIMM	OK
/SYSMB/P0/D4	DIMM	OK
/SYSMB/P0/D5	DIMM	OK
/SYSMB/P1	Host Processor	OK
/SYSMB/P1/D0	DIMM	OK
/SYSMB/P1/D1	DIMM	OK
/SYSMB/P1/D2	DIMM	OK
/SYSMB/P1/D3	DIMM	OK
/SYSMB/P1/D4	DIMM	OK
/SYSMB/P1/D5	DIMM	OK
/SYSMB/SASEXP0	I/O Board	OK
/SYSMB/SASEXP1	I/O Board	OK
/SYSMB/RHDD0	Hard Disk Module	-

# System Information: Fault Management

The screenshot shows the Oracle Integrated Lights Out Manager interface. At the top, there is a banner with the text "ABOUT" and "1 Warning", followed by "User: root Role: auro SP Hostname: hqodarac01at-l0m" and the title "Oracle® Integrated Lights Out Manager". Below the banner is a navigation menu with tabs: System Information, System Monitoring, Power Management, Storage, Configuration, User Management, Remote Control, and Maintenance. The "System Information" tab is selected. Underneath the menu is a sub-menu with tabs: Overview, Components, Fault Management, Identification Information, Banner Messages, Session Timeout, and Versions. The "Fault Management" tab is selected. The main content area is titled "Fault Management" and contains the sub-section "Faulted Components". A message "No Items To Display" is shown in this section.

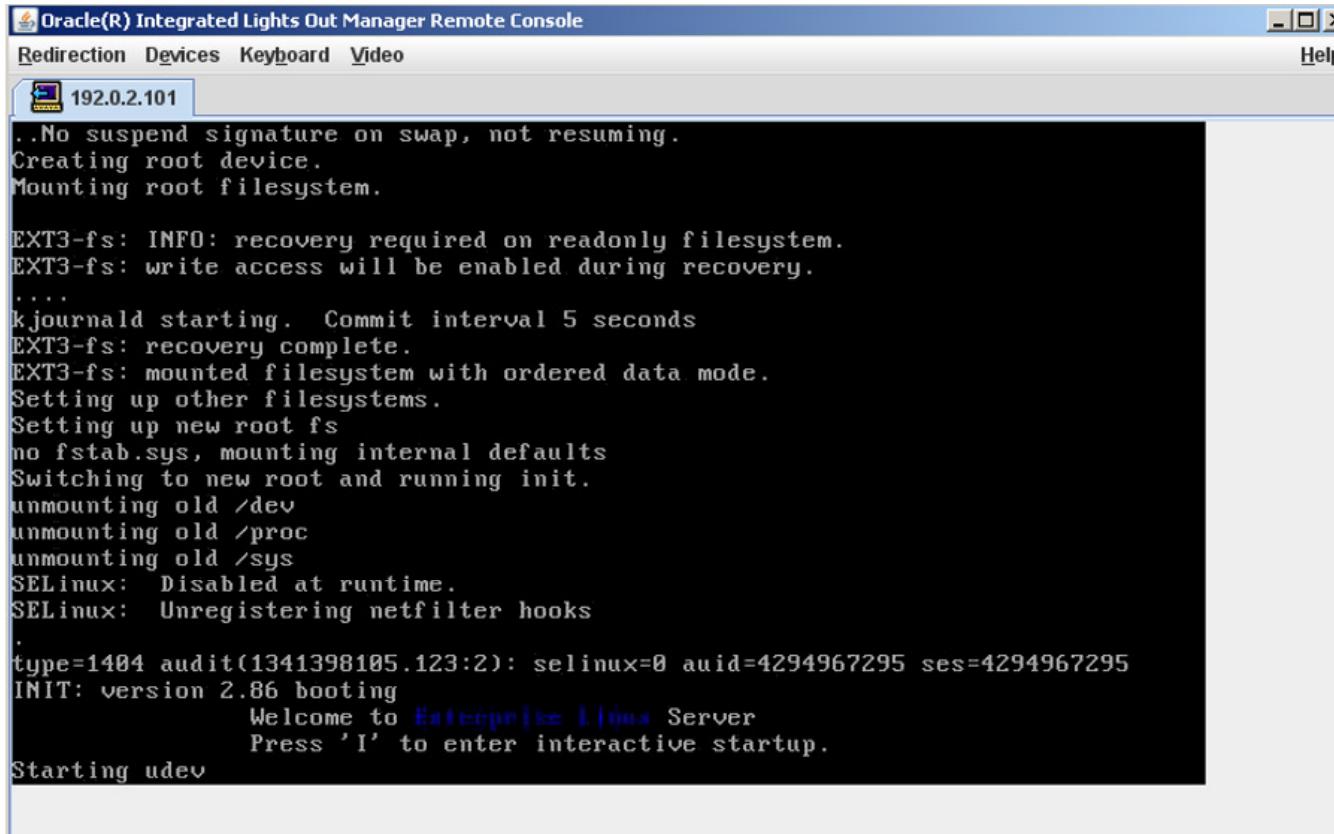
# System Information: Identification Information

The screenshot shows the Oracle Integrated Lights Out Manager (ILOM) interface. At the top, there is a banner with the text "ABOUT" and "1 Warning". Below the banner, it shows the user is "root" with a "Role: audio" and the "SP Hostname: hqodarac01atl-lom". The main title is "Oracle® Integrated Lights Out Manager". The navigation bar has tabs for "System Information", "System Monitoring", "Power Management", "Storage", "Configuration", "User Management", "Remote Control", and "Maintenance". The "System Information" tab is selected. Below the tabs, there are sub-tabs: "Overview", "Components", "Fault Management", "Identification Information" (which is selected and highlighted in blue), "Banner Messages", "Session Timeout", and "Versions". The main content area is titled "Identification Information" and contains the following configuration details:

SP Hostname:	hqodarac01atl-lom
SP System Identifier:	Oracle Database Appliance
SP System Contact:	oda@[REDACTED]
SP System Location:	[REDACTED] 12th Floor, Be
SP System Description:	SUN FIRE X4370 M2 SERVER, ILOM v3.0.14.13.a, r70764
Physical Presence Check:	<input checked="" type="checkbox"/> Enabled

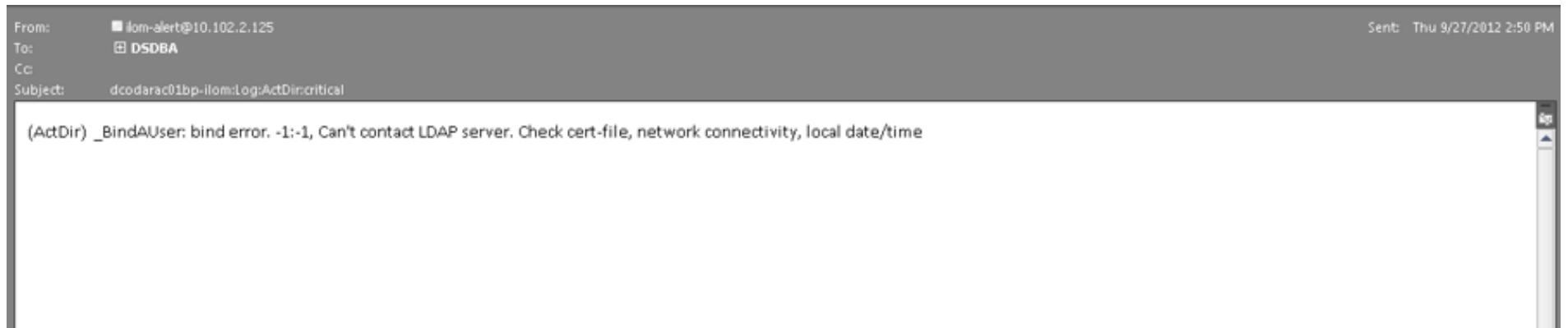
At the bottom of the form, there is a "Save" button.

# Remote Control: Host Control: Remote Console



# ILOM Warning Message

---



# More Value Adds: High Availability

---

- RAC
- Data Guard
- RMAN
- Replication
  - GoldenGate
  - Streams
- OEM Cloud Control 12c
  - Diagnostic Pack
  - Tuning Pack
  - Data Masking Pack
- One-Button Solutions

# Support Center

The screenshot displays two Oracle support-related web pages. The top portion shows the 'ORACLE Database Appliance Documentation' website, featuring a 'Welcome' section and a 'Documentation' sidebar with links to various setup and guide documents in both HTML and PDF formats. The bottom portion shows the 'MY ORACLE SUPPORT' knowledge base, with a search results page for 'Security Technical Implementation Guides'. The search results list three articles, each with a star rating, date, and a brief description.

**ORACLE Database Appliance Documentation**

Welcome

Welcome to the Oracle Database Appliance documentation library. Oracle Database Appliance is a highly available all-in-one cluster, database, and storage server. The product provides appliance-like ease of use for installation and management, greatly simplifying the deployment and maintenance of an enterprise-level highly available relational database system. Built using industry-standard Oracle Linux Servers, and intelligent database and storage software from Oracle, Oracle Database Appliance is a complete package of software, servers, and storage, optimized for simple deployment and easy maintenance.

**Documentation**

- Setup Poster X4-2 (Alternate text in HTML) [HTML](#) [PDF](#)
- Setup Poster X3-2 (Alternate text in HTML) [HTML](#) [PDF](#)
- Setup Poster (Alternate text in HTML) [HTML](#) [PDF](#)
- Getting Started Guide [HTML](#) [PDF](#)
- Release Notes [HTML](#) [PDF](#)
- Owner's Guide [HTML](#) [PDF](#)
- Service Manual [HTML](#) [PDF](#)
- Safety and Compliance Guide [HTML](#) [PDF](#)
- Licensing Information [HTML](#) [PDF](#)

**MY ORACLE SUPPORT**

Search: "Security Technical Implementation Guides"

Refine Search

Source: All Sources, Knowledge Base, Knowledge Base Archives, Bug Database, Patches, Documentation, Communities

1 - 3 of 3

- 28-Feb-2013 Oracle Exadata Database Machine DoD C&A STIG [Article ID 1526868.1] Purpose This document describes the implications of Department of Defense (DoD) DISA **Security Technical Implementation Guides** (STIGs) on Oracle Exadata Database Machine environments.
- 04-Apr-2013 Oracle Database Appliance DoD C&A STIG [Article ID 1456609.1] Main Content The Department of Defense (DoD) DISA Information Assurance Process includes Certification and Accreditation (C&A) including the **Security Technical Implementation Guides** (STIGs).
- 02-Jun-2013 STIG Implementation Script for Oracle Database Appliance [Article ID 1461102.1] Goal The **Security Technical Implementation Guides** (STIGs) and the NSA Guides are the configuration standards for DOD IA and IA-enabled devices/systems.

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Presented: Calgary Oracle Users Group - 20 March, 2014

# STIG Download

## ★ STIG Implementation Script for Oracle Database Appliance (Doc ID 1461102.1)

Modified: 03-Jun-2013 Type: HOWTO

[To Bottom](#)



### APPLIES TO:

Oracle Database Appliance - Version All Versions and later  
Oracle Appliance Kit - Version 2.2.0.0 to 2.6.0.0 [Release 2.2 to 2.6]  
Linux x86-64

```
# ./stig.sh -fix -force
```

```
*** Following is the list of stig violation fixed by script. ***
```

```
*** Below details can be found in log file: /opt/oracle/oak/log/stig/fix.log.06.06.12.02.41.49
```

```
*** Category : 1 ***
```

STIG-ID	: Filename	: Message	: Status
-----	-----	-----	-----
LNX00140	: /boot/grub/menu.lst	: Enable password for GRUB	: ALREADY DONE
.....			

### Attachments

 [Stig Script \(56.82 KB\)](#)

# STIG Script

---

- STIG Script Syntax

- The script logs its actions in the "/opt/oracle/oak/log//hostname/stig/" directory
- **-check** checks the system for guideline violations
- **-force** re-runs the script even if there are no violations
- **-fix** used to implement guideline recommendations
- lock and unlock options can be used to enable or disable direct ssh logging as root. Direct ssh login as root is required for Patching and therefore before patching, the unlock needs to be executed.

## Sample usage

```
# ./stig.sh -fix
```

# STIG Script Output: Category 1

```
2012-06-28 01:18:12 : Running stig script version: '1.0'
2012-06-28 01:18:12 : Executing script : ./stig.sh -check
2012-06-28 01:18:12 : Checking for stig violations on system 'orclsys'

2012-06-28 01:18:12 : List of Category-1 stig violation found by script
2012-06-28 01:18:12 : [STIG ID : LNX00140] : [CHECK] : Password for grub not enabled : FOUND
2012-06-28 01:18:12 : [STIG ID : GEN004640] : [CHECK] : sendmail decode command is not commented in /etc/aliases : FOUND
2012-06-28 01:18:12 : [STIG ID : LNX00320] : [CHECK] : Privilege account 'shutdown' is present : FOUND
2012-06-28 01:18:12 : [STIG ID : LNX00320] : [CHECK] : Privilege account 'halt' is present : FOUND
2012-06-28 01:18:12 : [STIG ID : LNX00580] : [CHECK] : Ctrl-Alt-Del combination to shutdown system is enabled : FOUND
2012-06-28 01:18:13 : [STIG ID : 2006-T-0013] : [CHECK] : RealVNC rpm is installed on system : FOUND
2012-06-28 01:18:13 : [STIG ID : LNX00040] : [CHECK] : Support for usb device found in kernel : FOUND

2012-06-28 01:18:13 : List of Category-2 stig violation found by script
2012-06-28 01:18:13 : [STIG ID : GEN000020] : [CHECK] : Single user mode boot is enabled without a password : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000340] : [CHECK] : Non privileged account oprofile found on system : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000340] : [CHECK] : Non privileged account avahi-autoipd found on system : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000460] : [CHECK] : pam_tally not used to lock account after 3 consecutive failed logins : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000800] : [CHECK] : remember not used in PAM configuration files : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000600] : [CHECK] : Force of at least one lower case character is not set for password : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000600] : [CHECK] : Force of at least one upper case character is not set for password : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000620] : [CHECK] : Force of at least one numeric character is not set for password : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000640] : [CHECK] : Force of at least one special character is not set for password : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000480] : [CHECK] : Login delay is not enabled in /etc/pam.d/system-auth : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000700] : [CHECK] : Maximum age for a password change is more than 60 days : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000540] : [CHECK] : Password can be changed more than once in 24 hours : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000580] : [CHECK] : Password length is less than 8 characters : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN001120] : [CHECK] : Direct login as root is enabled from ssh : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN002100] : [CHECK] : ekshell supported by the pam.rhost : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN002960] : [CHECK] : Access to cron is not through cron.allow and cron.deny : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN003080] : [CHECK] : Permission of file /etc/crontab is more permissive than octal 600 : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN003200] : [CHECK] : Permission of file /etc/cron.deny is more permissive than octal 600 : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN005400] : [CHECK] : Permission of file /etc/syslog.conf is more permissive than octal 640 : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN000920] : [CHECK] : Permission of directory /root is more permissive than octal 700 : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN003865] : [CHECK] : tcpdump rpm is installed on system : FOUND
2012-06-28 01:18:13 : [STIG ID : GEN004000] : [CHECK] : Permission of file /bin/traceroute is more permissive than octal 700 : FOUND
2012-06-28 01:18:13 : [STIG ID : LNX00340] : [CHECK] : Unnecessary account ftp found on system : FOUND

2012-06-28 01:18:35 : List of Category-3 stig violation found by script
2012-06-28 01:18:35 : [STIG ID : GEN004560] : [CHECK] : sendmail version is not hidden. : FOUND
```

# When is an ODA the right answer?

---

- Small to medium sized operation
  - Stand-alone or inside a much larger enterprise
- Desire ease of an appliance for
  - Installation
  - Configuration
  - Patching
  - Maintenance
  - Lower operating cost
- High availability
- Admin team too busy with other responsibilities to manage the complexity of RAC

# Syllabus

---

- Other Activities
- Mandatory Disclaimer
- ODA: Oracle Database Appliance
- ZFS Storage Appliance
- OVM: Oracle Virtual Machine



# What is ZFS?

---

- Designed to protect data on disk from data corruption caused by bit rot
- Similar advantages as ASM
- A 128 bit file system
- Eliminates the SAN lost write issue
- Integrated logical volume management

# What is a ZFS Storage Appliance?

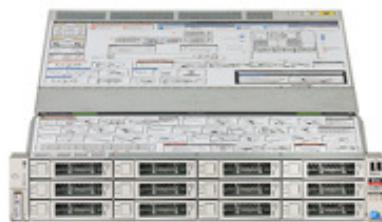
---

- NFS Mount to ODA or anything else
- Deduplication
- 10X – 50X compression with Hybrid Columnar Compression
- Optimized storage hierarchy with Hybrid Storage Pools containing DRAM, flash cache, and disk drives
- Simultaneous multiprotocol support across multiple network interconnects, including GbE, 10 GbE, fibre channel and InfiniBand
- 12c Cloud Control Integration

# What is a ZFS Storage Appliance?

---

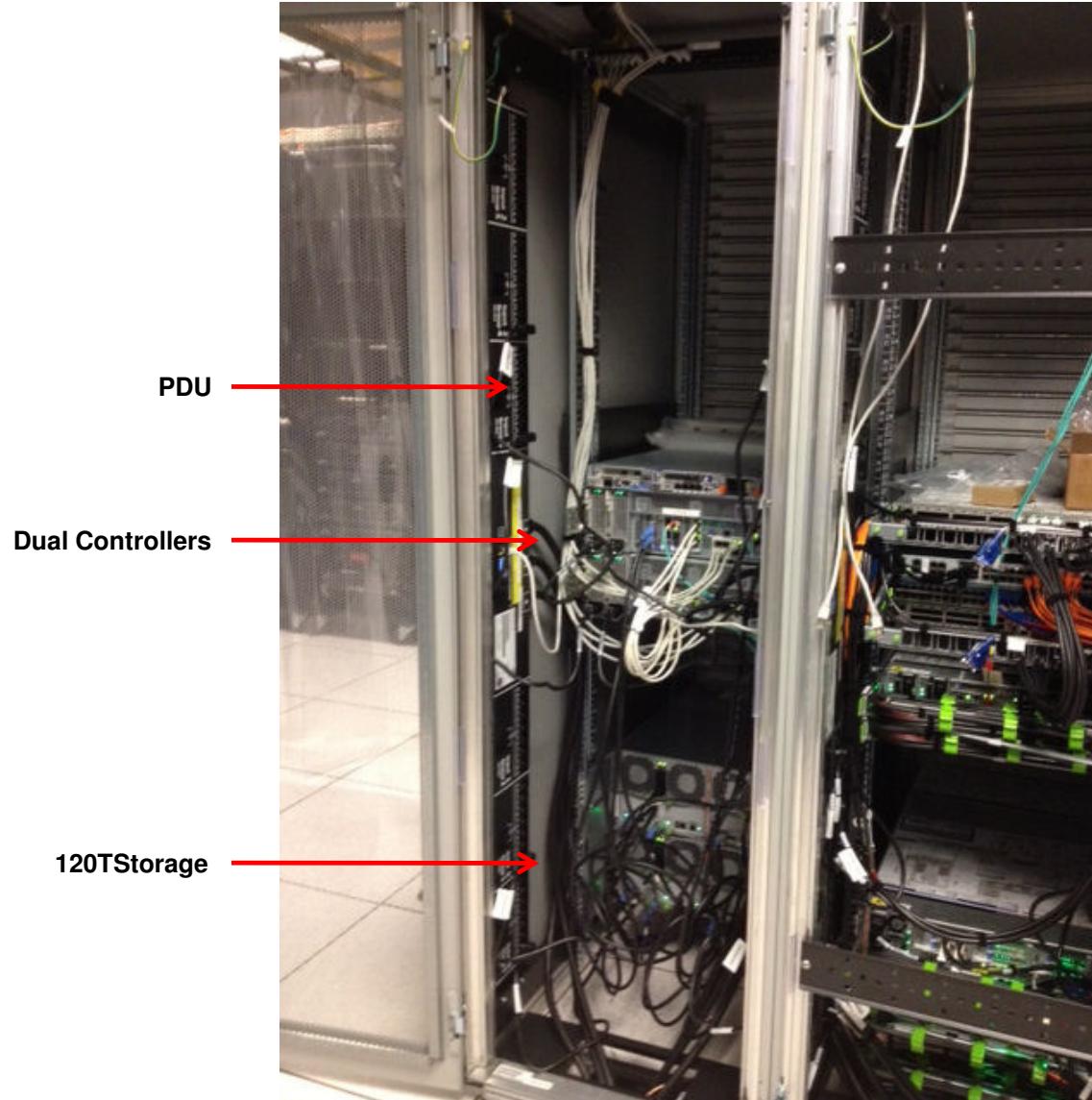
- Enterprise class Network Attached Storage (NAS)
- Choose the size that meets your needs
- Hybrid Columnar Compression (w/o an Exadata)
- Hybrid storage pools for DRAM and Flash caches
- DTrace storage analytics
- Use for
  - Backup and Restore
  - Cloning
  - Data Masking



# ZFS 7420



# ZFS Internals

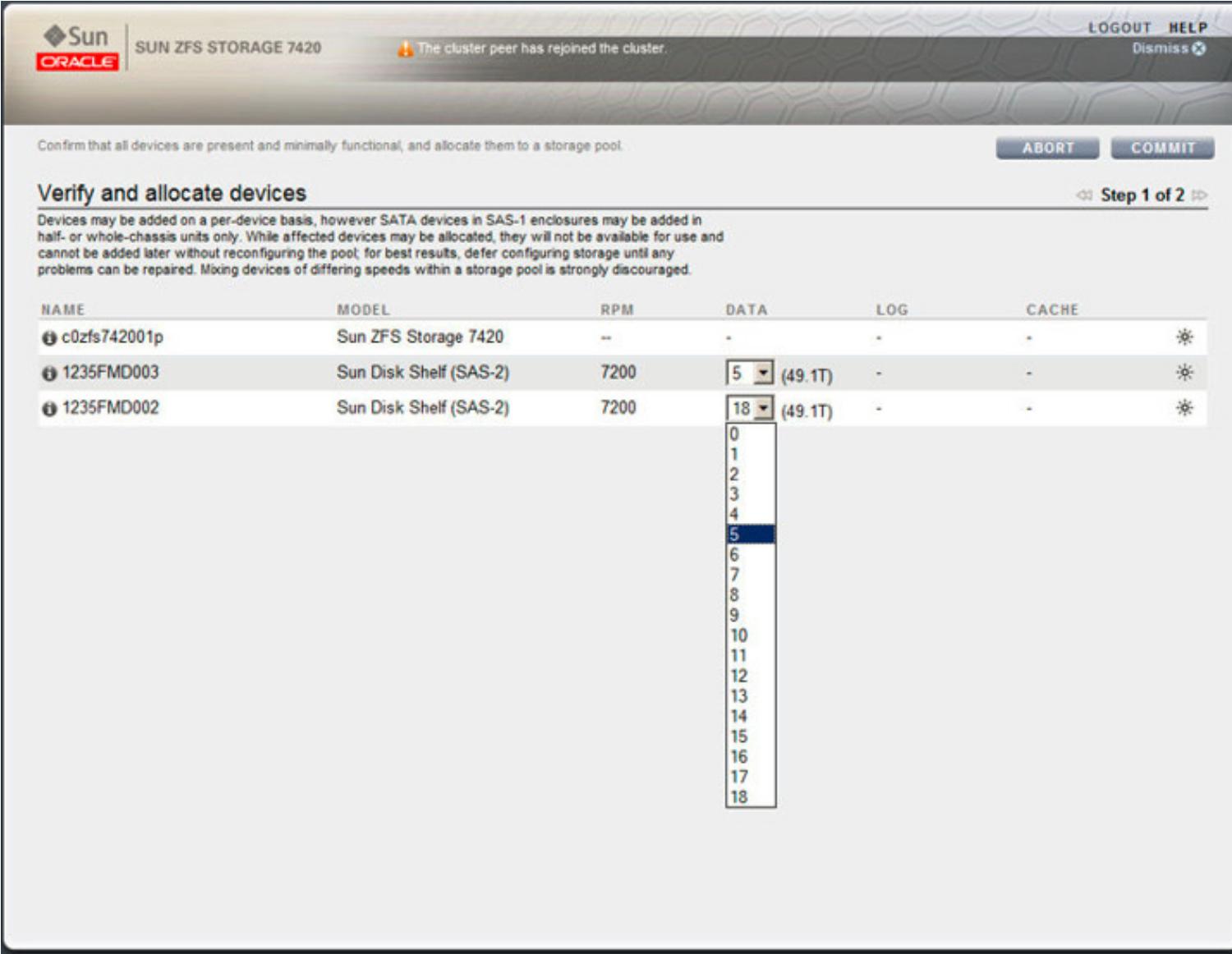


# ZFS BUI: Config Services

The screenshot shows the Sun ZFS Storage 7420 Configuration Services page. The top navigation bar includes links for Configuration, Maintenance, Shares, Status, and Analytics, with Configuration being the active tab. Below the navigation is a sub-navigation bar with links for Services, Storage, Network, SAN, Cluster, Users, Preferences, and Alerts, with Services being the active tab. A message at the top right states, "The cluster peer has rejoined the cluster." The main content area is titled "Services" and contains four sections: "Data Services", "Directory Services", "System Settings", and "Remote Access".

Service	Status	Last Update	Actions
NFS	Online	2012-10-10 09:28:04	edit power
iSCSI	Disabled	2012-9-25 16:19:00	edit power
SMB	Disabled	2012-9-25 16:19:15	edit power
FTP	Disabled	2012-9-20 17:49:03	edit power
HTTP	Disabled	2012-9-20 17:49:03	edit power
NDMP	Disabled	2012-9-25 16:19:21	edit power
Remote Replication	Online	2012-9-20 17:49:50	edit power
Shadow Migration	Online	2012-9-20 17:49:50	edit power
SFTP	Online	2012-9-21 18:50:18	edit power
SRP	Disabled	2012-9-20 17:49:03	edit power
TFTP	Disabled	2012-9-20 17:49:54	edit power
Virus Scan	Disabled	2012-9-29 17:49:03	edit power
NIS	Disabled	2012-9-25 16:12:36	edit power
LDAP	Online	2012-9-25 16:12:36	edit power
Active Directory	Online	2012-9-25 15:59:30	edit power
Identity Mapping	Online	2012-9-25 15:56:16	edit power
DNS	Online	2012-9-25 16:12:36	edit power
IPMP	Online	2012-9-20 17:49:51	edit power
NTP	Online	2012-9-24 14:23:46	edit power
Phone Home	Disabled	2012-9-20 17:49:50	edit power
Dynamic Routing	Online	2012-10-8 14:53:10	edit power
Service Tags	Online	2012-9-20 17:49:50	edit power
SMTP	Online	2012-9-25 16:12:36	edit power
SNMP	Online	2012-9-21 18:39:52	edit power
Syslog	Online	2012-9-21 18:20:47	edit power
System Identity	Online	2012-9-20 17:52:32	edit power
SSH	Online	2012-9-20 17:52:33	edit power

# ZFS BUI: Config Storage



The screenshot shows the Sun ZFS Storage 7420 BUI interface. At the top, there is a message: "The cluster peer has rejoined the cluster." On the right, there are "LOGOUT", "HELP", and "Dismiss" buttons. Below the message, a confirmation message reads: "Confirm that all devices are present and minimally functional, and allocate them to a storage pool." There are "ABORT" and "COMMIT" buttons on the right. The main area is titled "Verify and allocate devices" and includes a note: "Devices may be added on a per-device basis, however SATA devices in SAS-1 enclosures may be added in half- or whole-chassis units only. While affected devices may be allocated, they will not be available for use and cannot be added later without reconfiguring the pool; for best results, defer configuring storage until any problems can be repaired. Mixing devices of differing speeds within a storage pool is strongly discouraged." A table lists three devices: "c0zfs742001p" (Sun ZFS Storage 7420), "1235FMD003" (Sun Disk Shelf (SAS-2)), and "1235FMD002" (Sun Disk Shelf (SAS-2)). The "DATA" column for "1235FMD003" contains a dropdown menu with options from 0 to 18, with "5" selected. The "DATA" column for "1235FMD002" also contains a dropdown menu with options from 0 to 18, with "18" selected. The "LOG" and "CACHE" columns are empty for all devices.

NAME	MODEL	RPM	DATA	LOG	CACHE
c0zfs742001p	Sun ZFS Storage 7420	--	-	-	*
1235FMD003	Sun Disk Shelf (SAS-2)	7200	5 (49.1T)	-	*
1235FMD002	Sun Disk Shelf (SAS-2)	7200	18 (49.1T)	-	*

# ZFS BUI: Config Storage

SUN ZFS STORAGE 7420     ⚠ The cluster peer has rejoined the cluster.

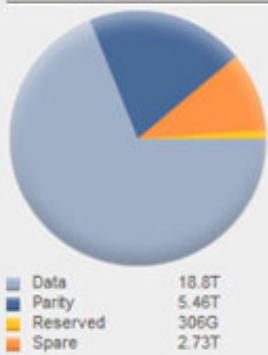
LOGOUT HELP     Dismiss X

Confirm that all devices are present and minimally functional, and allocate them to a storage pool.

**Choose Storage Profile**     Step 2 of 2

Configure available storage into a pool by defining its underlying redundancy profile. Carefully read the profile descriptions to understand how each balances the inherent trade-offs between availability, performance, and capacity, and select the profile that best fits your workload. If available, NSPF indicates no single point of failure, which affords certain profiles the ability for a pool to survive through loss of a single disk shelf.

**Storage Breakdown**



■ Data	18.8T
■ Parity	5.46T
■ Reserved	308G
■ Spare	2.73T

**Data Profile**

TYPE	NSPF	AVAILABILITY	PERFORMANCE	CAPACITY	SIZE
Double parity	No	<div style="width: 20%;"></div>	<div style="width: 20%;"></div>	<div style="width: 20%;"></div>	18.8T
Mirrored	Yes	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	10.7T
Mirrored	No	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	10.7T
Single parity, narrow stripes	No	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	16.1T
Striped	No	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	26.9T
Triple mirrored	Yes	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	8.06T
Triple mirrored	No	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	<div style="width: 100%;"></div>	8.06T
Triple parity, wide stripes	No	<div style="width: 20%;"></div>	<div style="width: 20%;"></div>	<div style="width: 20%;"></div>	16.1T

**Disk Breakdown**

Data + Parity	9 disks
Spare	1 disks
Log	0 disks
Cache	0 disks

**Data profile: Double parity**

Each array stripe contains two parity disks, yielding high availability while increasing capacity over mirrored configurations. Double parity striping is recommended for workloads requiring little or no random access, such as backup/restore.

# ZFS BUI: Config Network Config

The screenshot shows the Sun ZFS Storage 7420 BUI interface. The top navigation bar includes the Sun logo, 'SUN ZFS STORAGE 7420', and a user session 'Super-User@c0zfs742001p LOGOUT HELP'. The main menu tabs are Configuration, Maintenance, Shares, Status, and Analytics, with Configuration being the active tab. Below the menu is a sub-navigation bar with links to SERVICES, STORAGE, NETWORK, SAN, CLUSTER, USERS, PREFERENCES, and ALERTS. The main content area is titled 'Network' and contains three main sections: 'Devices', 'Datalinks', and 'Interfaces'. The 'Devices' section lists network interfaces categorized by PCIe slot (PCIe 3, PCIe 6, PCIe 7, PCIe 2) and their status (e.g., 1Gb (full), link down, port down). The 'Datalinks' section shows connections between interfaces (e.g., igb0 to igb0, igb1 to igb1, ixgbe0 to ixgbe0, ixgbe2 to ixgbe2). The 'Interfaces' section lists network interfaces with their IPv4 addresses (e.g., head1 net0: 192.168.40.248/22, via igb0). At the bottom of the screen are 'REVERT' and 'APPLY' buttons.

# ZFS BUI: Configuration Services LDAP

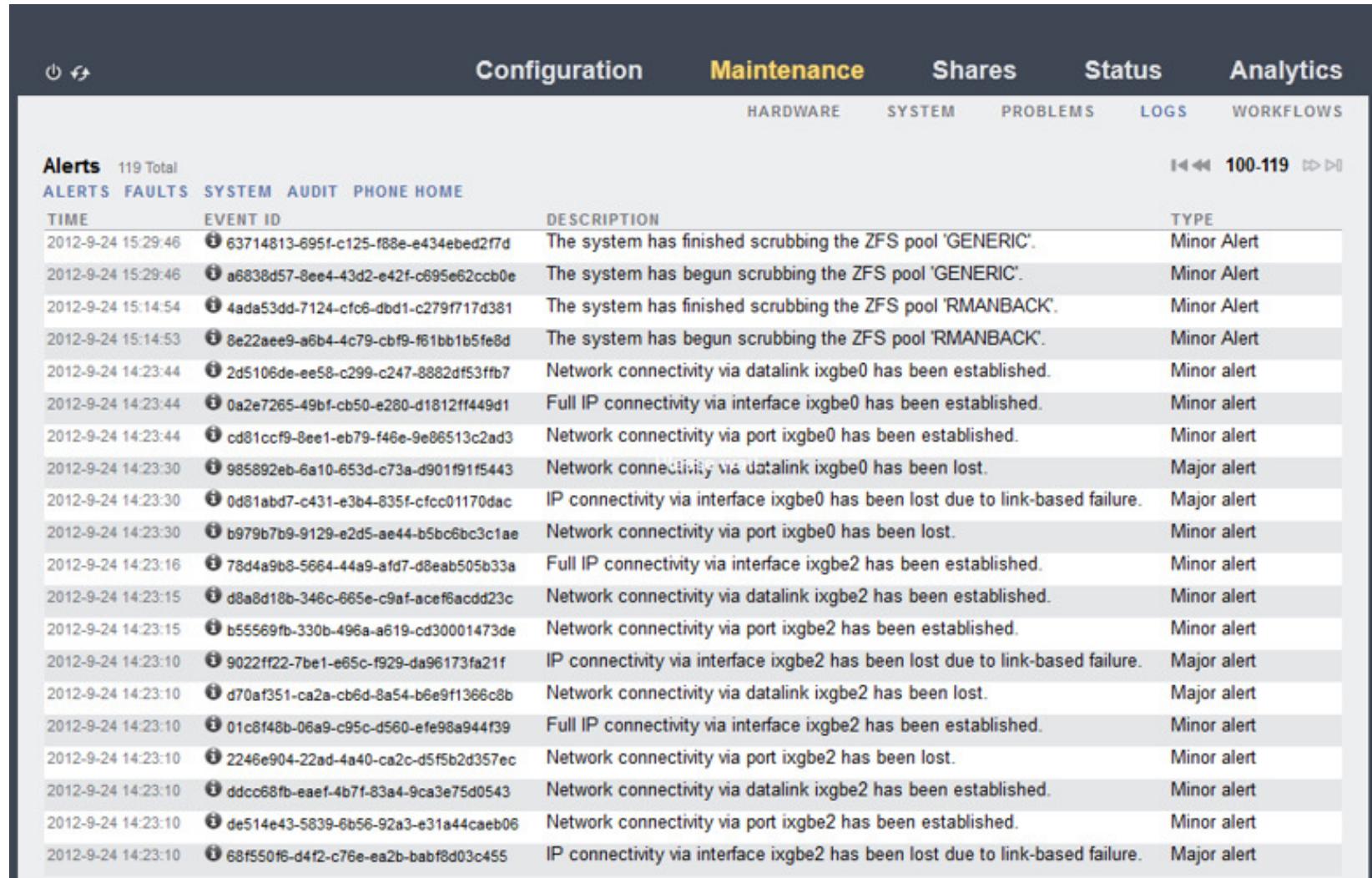
The screenshot shows the Sun ZFS Storage 7420 Configuration Services LDAP page. The top navigation bar includes links for Configuration, Maintenance, Shares, Status, and Analytics. The Configuration tab is selected, and the Services sub-tab is also selected. The LDAP tab is active. The page displays the following configuration details:

- LDAP Directory Service:** Recognize users and groups defined in an LDAP directory. Once the LDAP service is configured, go to Configuration/Users to give users permission to log into the administrative interface.
- See Also:** Help: LDAP, Wikipedia: LDAP
- Protect LDAP traffic with SSL/TLS:** A checkbox is present but not checked.
- Base search DN:** dc-unix, dc-m1ib,dc=com
- Search scope:** Subtree (recursive) is selected.
- Authentication method:** Simple (RFC 4513) is selected.
- Bind credential level:** Anonymous is selected.
- DN:** A text input field.
- Password:** A text input field.
- Self:** A radio button.
- Schema definition:** A link to edit the schema.

Below the configuration section, there is a table titled "Servers" with 1 total entry:

SERVER	CERTIFICATE	EXPIRES
perrito3.m1ib.com:389		

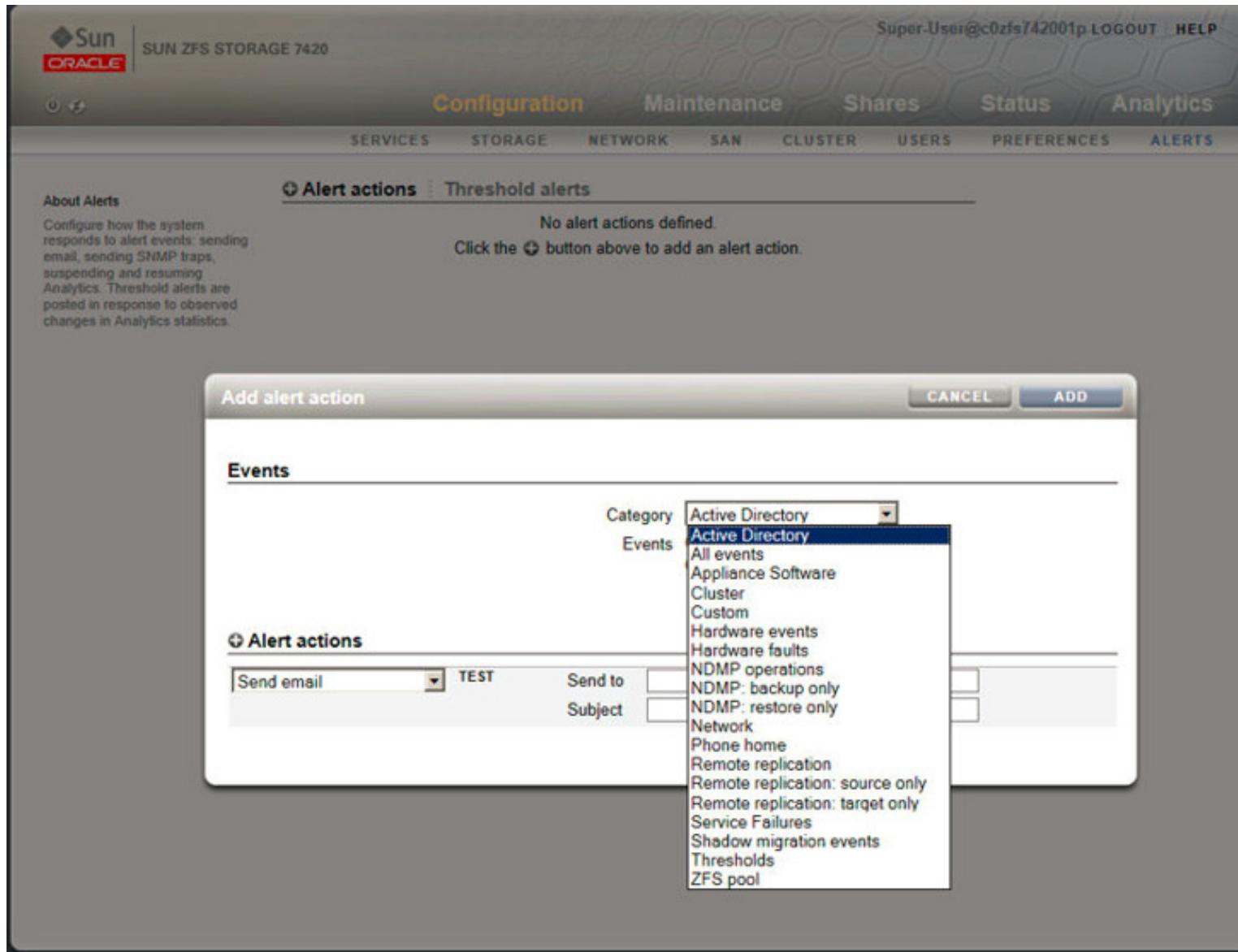
# ZFS BUI: Maintenance Logs



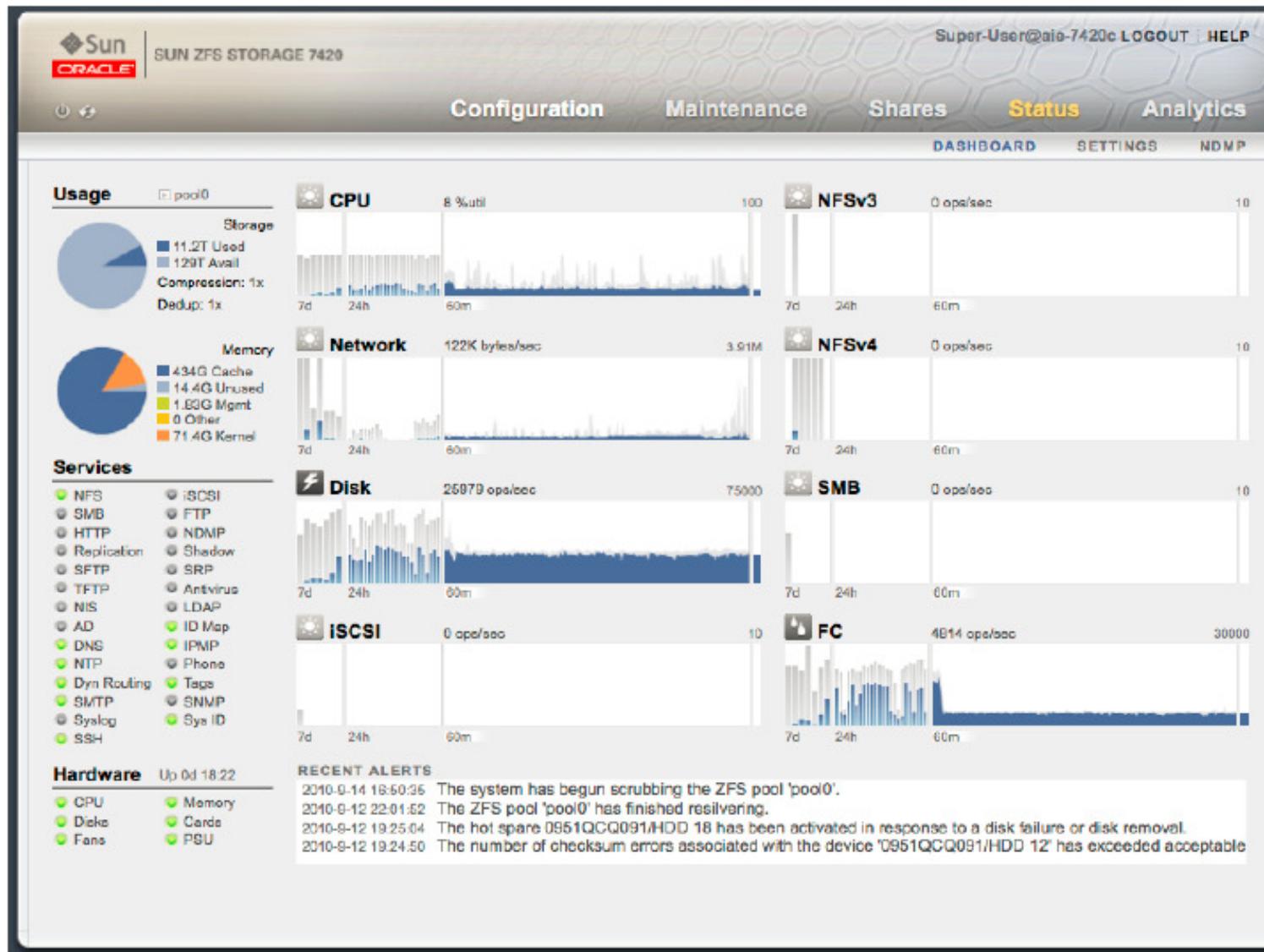
The screenshot shows the ZFS BUI Maintenance Logs page. At the top, there are navigation links for Configuration, Maintenance, Shares, Status, and Analytics, with Maintenance being the active tab. Below these are sub-links for Hardware, System, Problems, Logs, and Workflows. The main content area is titled 'Alerts' with a total of 119 items. It includes tabs for Alerts, Faults, System, Audit, Phone, and Home. The table lists alerts with columns for Time, Event ID, Description, and Type. The table has 20 rows, each representing an alert entry. The 'Time' column shows dates and times from 2012-9-24 14:23:44 to 2012-9-24 15:29:46. The 'Event ID' column contains various UUIDs. The 'Description' column provides a brief summary of each alert, such as 'The system has finished scrubbing the ZFS pool 'GENERIC''. The 'Type' column indicates the severity, with most being 'Minor Alert' and one being 'Major alert'.

TIME	EVENT ID	DESCRIPTION	TYPE
2012-9-24 15:29:46	63714813-695f-c125-f88e-e434ebcd27d	The system has finished scrubbing the ZFS pool 'GENERIC'.	Minor Alert
2012-9-24 15:29:46	a6838d57-8ee4-43d2-e42f-c695e62ccb0e	The system has begun scrubbing the ZFS pool 'GENERIC'.	Minor Alert
2012-9-24 15:14:54	4ada53dd-7124-cfc6-db1-c279f717d381	The system has finished scrubbing the ZFS pool 'RMANBACK'.	Minor Alert
2012-9-24 15:14:53	8e22aee9-a6b4-4c79-cbf9-f61bb1b5fe8d	The system has begun scrubbing the ZFS pool 'RMANBACK'.	Minor Alert
2012-9-24 14:23:44	2d5106de-ee58-c299-c247-8882df53ff7	Network connectivity via datalink ixgbe0 has been established.	Minor alert
2012-9-24 14:23:44	0a2e7265-49bf-cb50-e280-d1812ff449d1	Full IP connectivity via interface ixgbe0 has been established.	Minor alert
2012-9-24 14:23:44	cd81ccf9-8ee1-eb79-f46e-9e86513c2ad3	Network connectivity via port ixgbe0 has been established.	Minor alert
2012-9-24 14:23:30	985892eb-6a10-653d-c73a-d901f91f5443	Network connectivity via datalink ixgbe0 has been lost.	Major alert
2012-9-24 14:23:30	0d81abd7-c431-e3b4-835f-cfcc01170dac	IP connectivity via interface ixgbe0 has been lost due to link-based failure.	Major alert
2012-9-24 14:23:30	b979b7b9-9129-e2d5-ae44-b5bc6bc3c1ae	Network connectivity via port ixgbe0 has been lost.	Minor alert
2012-9-24 14:23:16	78d4a9b8-5664-44a9-af07-d8eab505b33a	Full IP connectivity via interface ixgbe2 has been established.	Minor alert
2012-9-24 14:23:15	d8a0d18b-346c-665e-c9af-acef6acdd23c	Network connectivity via datalink ixgbe2 has been established.	Minor alert
2012-9-24 14:23:15	b55569fb-330b-496a-a619-cd30001473de	Network connectivity via port ixgbe2 has been established.	Minor alert
2012-9-24 14:23:10	9022ff22-7be1-e65c-f929-da96173fa21f	IP connectivity via interface ixgbe2 has been lost due to link-based failure.	Major alert
2012-9-24 14:23:10	d70af351-ca2a-cb6d-8a54-b6e9f1366c8b	Network connectivity via datalink ixgbe2 has been lost.	Major alert
2012-9-24 14:23:10	01c8f48b-06a9-c95c-d560-e0e98a944f39	Full IP connectivity via interface ixgbe2 has been established.	Minor alert
2012-9-24 14:23:10	2246e904-22ad-4a40-ca2c-d5f5b2d357ec	Network connectivity via port ixgbe2 has been lost.	Minor alert
2012-9-24 14:23:10	ddcc68fb-eaef-4b7f-83a4-9ca3e75d0543	Network connectivity via datalink ixgbe2 has been established.	Minor alert
2012-9-24 14:23:10	de514e43-5839-6b56-92a3-e31a44caeb06	Network connectivity via port ixgbe2 has been established.	Minor alert
2012-9-24 14:23:10	68f550f6-d4f2-c76e-ea2b-babf8d03c455	IP connectivity via interface ixgbe2 has been lost due to link-based failure.	Major alert

# ZFS BUI: Configuration Alerts



# ZFS Storage Appliances



# Syllabus

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- Other Activities
- Mandatory Disclaimer
- ODA: Oracle Database Appliance
- ZFS Storage Appliance
- OVM: Oracle Virtual Machine



# Virtual Machines

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- There are a lot of VMs on the market
  - VMWare
  - Hyper-V
  - IBM LPar (Logical Partitions)
    - AIX - P Series
    - zLinux - Z Series
  - Sun Containers
  - OVM ... the Oracle Virtual Machine
- Most are generic and work well for app and web servers or for standing up development environments
- Most are totally unsuitable for enterprise-scale databases
- Support matters

# Why Does OVM Exist?

---

- Think about Oracle's development environment
- Think about virtualizing on one machine versus materializing on multiple machines
  - Enterprise Architecture
  - Resource pools



## Oracle VM

Designed for efficiency and optimized for performance, Oracle's server virtualization products support x86 and SPARC architectures and a variety of workloads such as Linux, Windows and Oracle Solaris. In addition to solutions that are hypervisor-based, Oracle also offers virtualization built in to hardware and Oracle operating systems to deliver the most complete and optimized solution for your entire computing environment.

- [Announcement: Oracle VM 3.2 Now Available - Delivers Unified Management and Enhanced Automation Capabilities for x86 Servers and Oracle SPARC Servers](#)
- [Announcement: Oracle VM Server for SPARC 3.1](#)

See also: [Oracle Virtualization](#) | [Oracle VM Templates](#) | [Virtualization Topic](#) | [Cloud Topic](#) | [Oracle VM Wiki](#)

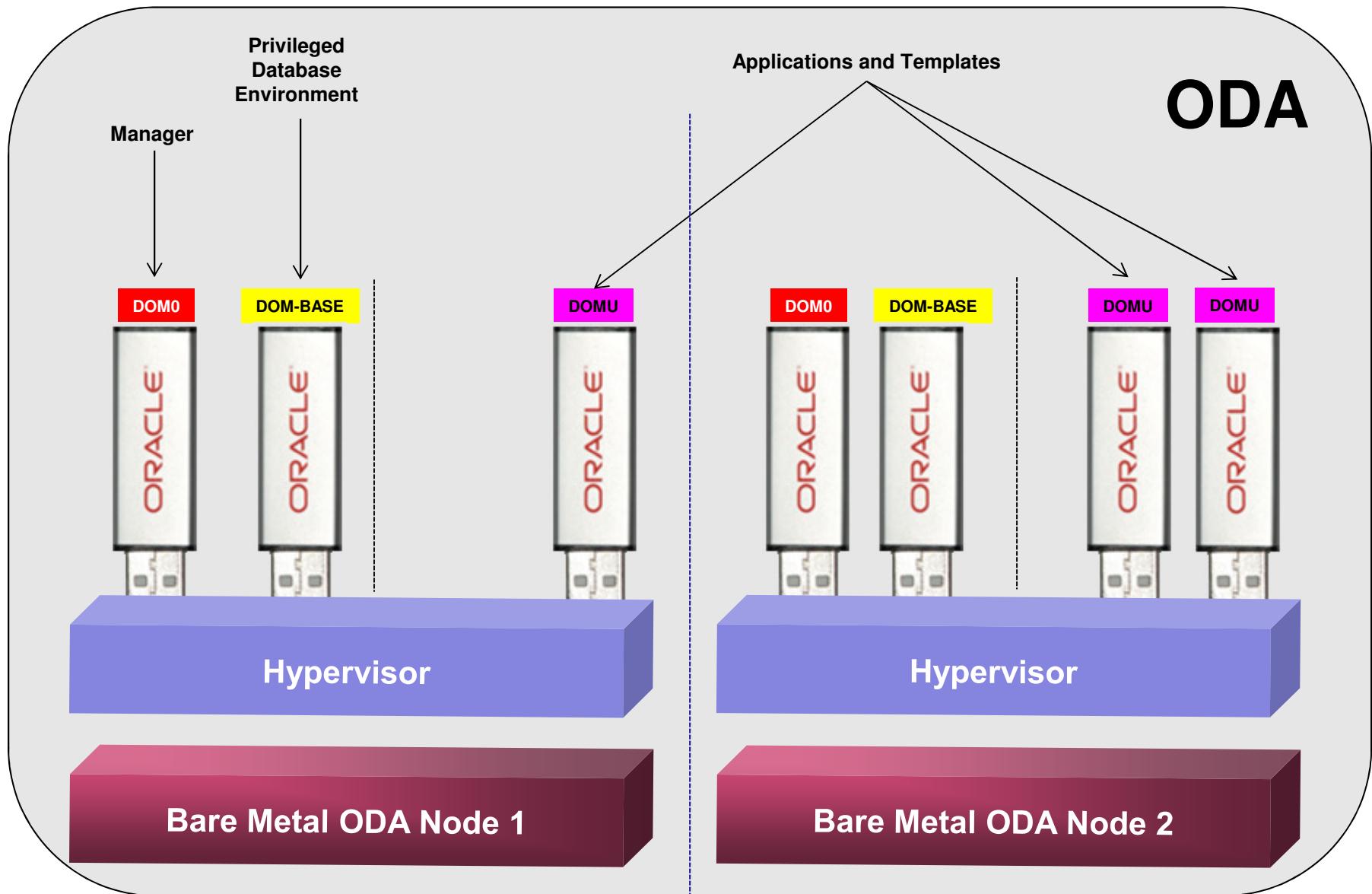
### Oracle VM Server for x86 Technical White Papers

- [Oracle VM 3: Architecture and Technical Overview \(PDF\)](#)
- [Designing, Creating and Testing an Oracle VM 3.2 Environment \(PDF\)](#)
- [Oracle VM 3: Backup and Recovery Best Practices Guide \(PDF\)](#)
- [Oracle VM 3: Storage Connect Overview \(PDF\)](#)
- [Oracle VM 3: Server Pool Deployment Planning Considerations for Scalability and Availability \(PDF\)](#)
- [Oracle VM 3: Quick Start Guide \(PDF\)](#)
- [Oracle VM 3: Integrating Oracle VM into a Disaster Recovery Solution using SAN \(PDF\)](#)
- [Oracle VM 3: Looking "Under the Hood" at Networking \(HTML\), Fundamental Concepts for VLAN Networks \(HTML\), and Network Naming \(HTML\)](#)
- [Oracle VM 3: 10GbE Network Performance Tuning \(PDF\)](#)
- [Oracle VM 3: Building a Demo Environment using Oracle VM VirtualBox \(PDF\)](#)
- [Oracle Real Application Clusters in Oracle VM Environments \(PDF\)](#)

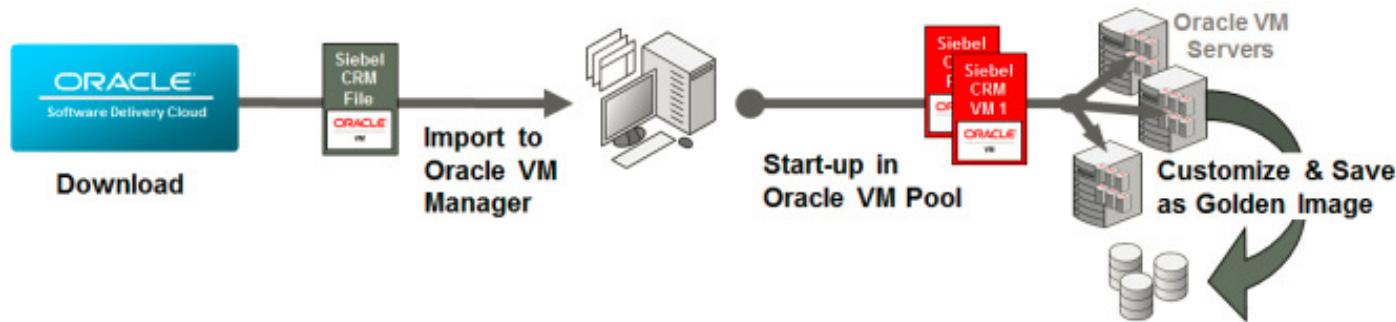
# OVM

The screenshot shows the Oracle Technology Network (OTN) website for Oracle VM Documentation. The top navigation bar includes links for Sign In/Register, Help, Country, Communities, I am a..., I want to..., Search, Products, Solutions, Downloads, Store, Support, Training, Partners, About, and OTN. The page title is "Oracle Technology Network > Server and Storage Systems > Oracle VM > Documentation". On the left, a sidebar lists various Oracle products: Engineered Systems, Ksplice, Oracle Linux, Oracle Optimized Solutions, Oracle VM, Oracle VM VirtualBox, SAN Storage, Secure Global Desktop, Server Management Tools, Solaris 10, Solaris 11, Solaris Cluster, Solaris Studio, SPARC Servers, StorageTek Tape Storage, Sun Blade 6000 Modular Systems, and Sun Desktops & Peripherals. The main content area has tabs for Overview, Downloads, Documentation (which is selected), Community, Learn More, and Partners. The Documentation tab content includes sections for "Oracle VM Server for x86 and Oracle VM Manager Documentation Library" (listing releases 3.2, 3.1.1, 3.0.3, 3.0, 2.2, 2.1, and a note about the complete documentation library) and "Oracle VM Server for SPARC Documentation Library" (listing releases 3.1, 3.0, 2.2, 2.1, 2.0, and a note about the complete documentation library). To the right, there are sections for "Compatibility & Templates" (Hardware Certification List, Oracle Validated Configurations, VM Templates), "News" (Nimble Storage announces a new SmartStack™ solution, Open Universities Realizes Valuable Savings with Oracle VM, Oracle VM for x86 Certified by SAP), "Training" (Oracle VM Training), "Blogs" (Oracle Virtualization, Wim Coekaerts, OTN Garage: Oracle VM), and "Valuable Assets".

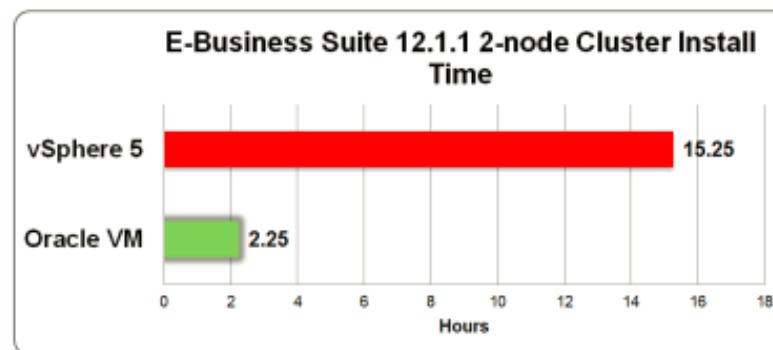
# ODA OVM Architecture



# OVM



Deploy E-Business Suite up to 7x Faster Than VMware



# Questions

---

**ERROR at line 1:  
ORA-00028: your session has been killed**



Thank you

---

**Thank you for taking the  
time to join us today**

**if you are not actively involved in the COUG  
today is a perfect day to join  
and support yourself and your community**



**Calgary *ORACLE*  
Users Group**

Daniel A. Morgan | [damorgan12c@gmail.com](mailto:damorgan12c@gmail.com) | [www.morganslibrary.org](http://www.morganslibrary.org)

One Hundred Degrees of Separation

Presented: Calgary Oracle Users Group - 20 March, 2014