Oracle®Virtual Compute Appliance

Administrator's Guide for Release 1.1

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Oracle®Virtual Compute Appliance: Administrator's Guide for Release 1.1

Table of Contents

Preface

This document is part of the documentation library for Oracle Virtual Compute Appliance Release 1.1, which is available at:

http://docs.oracle.com/cd/E52085_01.

The documentation library consists of the following items:

Oracle Virtual Compute Appliance Release Notes
The release notes provide a summary of the new features, changes, fixed bugs and known issues in Oracle Virtual Compute Appliance.

Oracle Virtual Compute Appliance Installation Guide
The installation guide provides detailed instructions to prepare the installation site and install Oracle Virtual Compute Appliance. It also includes the procedure to install an additional compute node.

Oracle Virtual Compute Appliance Safety and Compliance Guide
The safety and compliance guide is a supplemental guide to the safety aspects of Oracle Virtual Compute Appliance. It conforms to Compliance Model No. OCA1A.

Oracle Virtual Compute Appliance Administrator's Guide
The administrator's guide provides instructions for using the management software. It is a comprehensive guide to how to configure, monitor and administer Oracle Virtual Compute Appliance.

Oracle Virtual Compute Appliance Quick Start Poster
The quick start poster provides a step-by-step description of the hardware installation and initial software configuration of Oracle Virtual Compute Appliance. A printed quick start poster is shipped with each Oracle Virtual Compute Appliance base rack, and is intended for data center operators and administrators who are new to the product.

The quick start poster is also available in the documentation library as an HTML guide, which contains alternate text for ADA 508 compliance.

Oracle Virtual Compute Appliance Expansion Node Setup Poster
The expansion node setup poster provides a step-by-step description of the installation procedure for an Oracle Virtual Compute Appliance expansion node. A printed expansion node setup poster is shipped with each Oracle Virtual Compute Appliance expansion node.

The expansion node setup poster is also available in the documentation library as an HTML guide, which contains alternate text for ADA 508 compliance.

Audience

The Oracle Virtual Compute Appliance documentation is written for technicians, authorized service providers, data center operators and system administrators who want to install, configure and maintain a virtual compute environment in order to deploy virtual machines for users. It is assumed that readers have experience installing and troubleshooting hardware, are familiar with web and virtualization technologies and have a general understanding of operating systems such as UNIX (including Linux) and Windows.

The Oracle Virtual Compute Appliance makes use of Oracle Linux and Oracle Solaris operating systems within its component configuration. It is advisable that administrators have experience of these operating systems at the very least. Oracle Virtual Compute Appliance is capable of running virtual machines with a variety of operating systems including Oracle Solaris and other UNIXes, Linux and Microsoft Windows. The selection of operating systems deployed in guests on Oracle Virtual Compute Appliance determines the requirements of your administrative knowledge.

Related Documentation

Additional documentation for components related to Oracle Virtual Compute Appliance is available as follows:

- All Oracle products

  http://www.oracle.com/documentation

- Sun Rack II 1042 and 1242

  http://docs.oracle.com/cd/E19844-01/index.html

- Sun Server X4-2

  http://docs.oracle.com/cd/E36975_01/index.html

- Sun Server X3-2

  http://docs.oracle.com/cd/E22368_01/index.html

- Oracle ZFS Storage Appliance ZS3-ES

  http://docs.oracle.com/cd/E27998_01/index.html

- Sun ZFS Storage Appliance 7320

  http://docs.oracle.com/cd/E28317_01/index.html

- Oracle Switch ES1-24

  http://docs.oracle.com/cd/E39109_01/index.html

- NM2-36P Sun Datacenter InfiniBand Expansion Switch

  http://docs.oracle.com/cd/E26698_01/index.html

- Oracle Fabric Interconnect F1-15 Director Switch

  http://docs.oracle.com/cd/E38500_01/index.html

- Oracle Integrated Lights Out Manager (ILOM) 3.1

  http://docs.oracle.com/cd/E24707_01/index.html

- Oracle VM

  http://docs.oracle.com/cd/E35328_01/index.html

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Chapter 1 Concept, Architecture and Life Cycle of Oracle Virtual Compute Appliance

Table of Contents

This chapter describes what Oracle Virtual Compute Appliance is, which hardware and software it consists of, and how it is deployed as a virtualization platform.

1.1 What is Oracle Virtual Compute Appliance

Responding to the Cloud Challenges

Cloud architectures and virtualization solutions have become highly sophisticated and complex to implement. They require a skill set that no single administrator has had to master in traditional data centers: system hardware, operating systems, network administration, storage management, applications. Without expertise in every single one of those domains, an administrator is unable to take full advantage of the features and benefits of virtualization technology. This often leads to poor implementations with sub-optimal performance and reliability, which impairs the flexibility of a business.

Aside from the risks created by technical complexity and lack of expertise, companies also suffer from an inability to deploy new infrastructure quickly enough to suit their business needs. The administration involved in the deployment of new systems, and the time and effort to configure these systems, can amount to weeks. Provisioning new applications into flexible virtualized environments, in a fraction of the time required for physical deployments, generates substantial financial benefits.

Fast Deployment of Converged Infrastructure

Oracle Virtual Compute Appliance is an offering that industry analysts refer to as a *Converged Infrastructure Appliance*: an infrastructure solution in the form of a hardware appliance that comes from

the factory pre-configured. It enables the operation of the entire system as a single unit, not a series of individual servers, network hardware and storage providers. Installation, configuration, high availability, expansion and upgrading are automated and orchestrated as much as possible. Within a few hours after power-on, the appliance is ready to create virtual servers. Virtual servers are commonly deployed from Oracle VM templates (individual pre-configured VMs) and assemblies (interconnected groups of pre-configured VMs).

Modular Implementation of a Complete Stack

With Oracle Virtual Compute Appliance, Oracle offers a unique full stack of hardware, software, virtualization technology and rapid application deployment through assemblies. All this is packaged in a single modular and extensible product. The minimum configuration consists of a base rack with infrastructure components, a pair of management nodes, and two compute nodes. This configuration can be extended by one compute node at a time. All rack units, whether populated or not, are pre-cabled and pre-configured at the factory in order to facilitate the installation of expansion compute nodes on-site at a later time.

Ease of Use

The primary value proposition of Oracle Virtual Compute Appliance is the integration of components and resources for the purpose of ease of use and rapid deployment. It should be considered a general purpose solution in the sense that it supports the widest variety of operating systems, including Windows, and any application they might host. Customers can attach their existing storage or provide storage solutions from Oracle or third parties.

1.2 Hardware Components

The Oracle Virtual Compute Appliance consists of a Sun Rack II 1242 base, populated with the hardware components identified in Figure 1.1.

Figure 1.1 Components of an Oracle Virtual Compute Appliance Rack

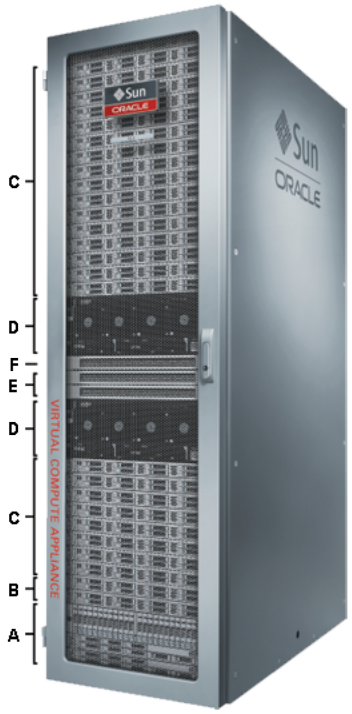


Table 1.1 Figure Legend

Item	Quantity	Description
A	1	Oracle ZFS Storage Appliance ZS3-ES (for Release 1.0 base rack: Sun ZFS Storage Appliance 7320)
B	2	Sun Server X4-2, used as management nodes (for Release 1.0 base rack: Sun Server X3-2)
C	2-25	Sun Server X4-2, used as virtualization compute nodes (for Release 1.0 base rack: Sun Server X3-2)
D	2	Oracle Fabric Interconnect F1-15 Director Switch
E	2	NM2-36P Sun Datacenter InfiniBand Expansion Switch
F	2	Oracle Switch ES1-24

1.2.1 Management Nodes

At the heart of each Oracle Virtual Compute Appliance installation is a pair of management nodes. They are installed in rack units 5 and 6 and form a cluster in active/standby configuration for high availability: both servers are capable of running the same services and have equal access to the system configuration, but one operates as the master while the other is ready to take over the master functions in case a failure occurs. The master management node runs the full set of services required, while the standby management node runs a subset of services until it is promoted to the master role. The master role is determined at boot through OCFS2 Distributed Lock Management on an iSCSI LUN, which both management nodes share on the ZFS storage appliance installed at the bottom of the rack. Because rack units are numbered from the bottom up, the master management node is typically the server in rack unit 5. It is the only server that must be powered on by the administrator in the entire process to bring the appliance online.

For details about how high availability is achieved with Oracle Virtual Compute Appliance, refer to Section 1.5, “High Availability”.

When you power on the Oracle Virtual Compute Appliance for the first time, you can change the factory default IP configuration of the management node cluster, so that they can be easily reached from your data center network. The management nodes share a Virtual IP, where the management web interface can be accessed. (This virtual IP is assigned to whichever server has the *master* role at any given time.) During system initialization, after the management cluster is set up successfully, the master management node loads a number of Oracle Linux 6 services, in addition to Oracle VM and its associated MySQL database – including network, sshd, ntpd, iscsi initiator, dhcpd – to be able to orchestrate the provisioning of all system components. During provisioning, all networking and storage is configured, and all compute nodes are discovered, installed and added to an Oracle VM server pool. All provisioning configurations are preloaded at the factory and should not be modified by the customer.

For details about the provisioning process, refer to Section 1.4, “Provisioning and Orchestration”.

1.2.2 Compute Nodes

The compute nodes in the Oracle Virtual Compute Appliance constitute the virtualization platform. The compute nodes provide the processing power and memory capacity for the virtual servers they host. The entire provisioning process is orchestrated by the management nodes: compute nodes are installed with Oracle VM Server 3.2.4 and additional packages for InfiniBand and Software Defined Networking. When provisioning is complete, the Oracle Virtual Compute Appliance software expects all compute nodes in the same rack to be part of the same Oracle VM server pool.

For hardware configuration details of the Sun Server X4-2 and Sun Server X3-2 compute nodes, refer to Server Components in the Oracle Virtual Compute Appliance Installation Guide. Both generations of Sun Servers may be mixed within the same installation. This occurs with Release 1.0 base racks that are upgraded to the Release 1.1 software stack: the management nodes and factory-installed compute nodes are Sun Server X3-2, which may be combined with new Sun Server X4-2 expansion nodes. Compute nodes of different hardware generations operate within the same server pool but belong to different CPU compatibility groups. Since live migration between CPU compatibility groups is not supported, virtual machines have to be cold-migrated between a Sun Server X3-2 and Sun Server X4-2 compute node. For more information about CPU compatibility groups, please refer to the section "Server Processor Compatibility Groups" in the Oracle VM User's Guide.

The Oracle Virtual Compute Appliance Dashboard allows the administrator to monitor the health and status of the compute nodes, as well as all other rack components, and perform certain system operations. The virtual infrastructure is configured and managed with Oracle VM Manager.

The compute capacity of the Oracle Virtual Compute Appliance can be built up in a modular way, in accordance with business needs. The minimum configuration of the base rack contains just two compute nodes, but it can be expanded by one node at a time up to 25 compute nodes. Apart from the hardware installation, adding compute nodes requires no intervention by the administrator. New nodes are discovered, powered on, installed and provisioned automatically by the master management node. The additional compute nodes are integrated into the existing configuration, and as a result, the Oracle VM server pool offers increased capacity for more or larger virtual machines.

Since it is difficult to quantify the compute capacity as a number of virtual machines, it is suggested that you base calculations on the amount of RAM as a rule of thumb. With 256GB per compute node and a minimal *dom0* overhead, it is safe to assume that each compute node can host 60 virtual machines with 4GB RAM, or 30 virtual machines with 8GB RAM, or 15 virtual machines with 16GB RAM, or any combination that adds up to an amount of RAM just a couple of GB under the server's physical memory.

1.2.3 Storage Appliance

The Oracle ZFS Storage Appliance ZS3-ES installed at the bottom of the appliance rack should be considered a 'system disk' for the entire appliance. Its main purpose is to provide storage space for the Oracle Virtual Compute Appliance software. A portion of the disk space is made available for customer use and is sufficient for an Oracle VM storage repository with a limited number of virtual machines, templates and assemblies.

The hardware configuration of the Oracle ZFS Storage Appliance ZS3-ES is as follows:

- Two clustered storage heads with two 1.6TB SSDs each, used exclusively for cache and logging
- One fully populated disk chassis with twenty 900GB SATA hard disks
- RAID-Z2 configuration, for best balance between performance and data protection, with a total usable space of 11.3TB

Note

Oracle Virtual Compute Appliance Release 1.0 base racks, which maybe upgraded to the Release 1.1 software stack, use a Sun ZFS Storage Appliance 7320. It offers the same performance, functionality and configuration, but its storage heads use smaller SSDs. The disk shelf and its disks are identical in both models.

The storage appliance is connected to the management subnet (`192.168.4.0/24`) and the InfiniBand (IPoIB) storage subnet (`192.168.40.0/24`). Because both heads form a cluster, they share a single IP in each subnet. The RAID-Z2 storage pool contains two projects, named `OVCA` and `OVM` .

The OVCA project contains all LUNs and file systems used by the Oracle Virtual Compute Appliance software:

- LUNs
  - Locks (12GB) – to be used exclusively for cluster locking on the two management nodes
  - Manager (200GB) – to be used exclusively as an additional file system on both management nodes
- File systems:
  - MGMT_ROOT – to be used for storage of all files specific to the Oracle Virtual Compute Appliance
  - Database – to be used for all system databases
  - Incoming (20GB) – to be used for FTP file transfers, primarily for Oracle Virtual Compute Appliance component backups
  - Templates – placeholder file system for future use
  - User – placeholder file system for future use
  - Yum – placeholder file system for future use

The OVM project contains all LUNs and file systems used by Oracle VM:

- LUNs
  - iscsi_repository1 (300GB) – to be used as Oracle VM storage repository
  - iscsi_serverpool1 (12GB) – to be used as server pool file system for the Oracle VM clustered server pool
- File systems:
  - nfs_repository1 (300GB) – to be used as Oracle VM storage repository in case NFS is preferred over iSCSI
  - nfs_serverpool1 (12GB) – to be used as server pool file system for the Oracle VM clustered server pool in case NFS is preferred over iSCSI

In addition to offering storage, the ZFS storage appliance also runs the xinetd and tftpd services. These complement the Oracle Linux services on the master management node in order to orchestrate the provisioning of all Oracle Virtual Compute Appliance system components.

1.2.4 Network Infrastructure

The Oracle Virtual Compute Appliance relies on a combination of Ethernet connectivity and an InfiniBand network fabric. The appliance rack contains redundant network hardware components, which are pre-cabled at the factory to help ensure continuity of service in case a failure should occur.

Ethernet

The Ethernet network relies on two interconnected Oracle Switch ES1-24 switches, to which all other rack components are connected with CAT6 Ethernet cables. This network serves as the appliance management network, in which every component has a predefined IP address in the 192.168.4.0/24 range. In addition, all management and compute nodes have a second IP address in this range, which is used for Oracle Integrated Lights Out Manager (ILOM) connectivity.

While the appliance is initializing, the InfiniBand fabric is not accessible, which means that the management network is the only way to connect to the system. Therefore, one of the Oracle Switch ES1-24 switches has an Ethernet cable attached to port 24, which the administrator should use to connect a workstation with fixed IP address `192.168.4.254` . From this workstation, the administrator opens a browser connection to the web server on the master management node at `http://192.168.4.3` [1] , in order to monitor the initialization process and perform the initial configuration steps when the appliance is powered on for the first time.

InfiniBand

The Oracle Virtual Compute Appliance rack contains two NM2-36P Sun Datacenter InfiniBand Expansion Switches. These redundant switches have redundant cable connections to both InfiniBand ports in each management node, compute node and storage head. Both InfiniBand switches, in turn, have redundant cable connections to both Oracle Fabric Interconnect F1-15 Director Switches in the rack. All these components combine to form a physical InfiniBand backplane with a 40Gbit (Quad Data Rate) bandwidth.

When the appliance initialization is complete, all necessary Oracle Virtual Compute Appliance software packages, including host drivers and InfiniBand kernel modules, have been installed and configured on each component. At this point, the system is capable of using software defined networking (SDN) configured on top of the physical InfiniBand fabric. SDN is implemented through the Oracle Fabric Interconnect F1-15 Director Switches.

Fabric Interconnect

All Oracle Virtual Compute Appliance network connectivity is managed through the Oracle Fabric Interconnect F1-15 Director Switches. Data is transferred across the physical InfiniBand fabric, but connectivity is implemented in the form of Software Defined Networks (SDN) – sometimes referred to as 'clouds'. The physical InfiniBand backplane is capable of hosting thousands of virtual networks. These Private Virtual Interconnects (PVI) dynamically connect virtual machines and bare metal servers to networks, storage and other virtual machines, while maintaining the traffic separation of hard-wired connections and surpassing their performance.

During the initialization process of the Oracle Virtual Compute Appliance, five essential SDNs are configured: a storage network, an Oracle VM management network, a management Ethernet network, and two VLAN-enabled virtual machine networks.

- The **storage network** is a bonded IPoIB connection between the management nodes and the ZFS storage appliance, and uses the `192.168.40.0/24` subnet.
- The **Oracle VM management network** is a PVI that connects the management nodes and compute nodes in the `192.168.140.0/24` subnet. It is used for all network traffic inherent to Oracle VM Manager, Oracle VM Server and the Oracle VM Agents.
- The **management Ethernet network** is a bonded Ethernet connection between the compute nodes. The primary function of this network is to provide access to the management nodes from the data center network, and enable the management nodes to run a number of system services. Since all compute nodes are also connected to this network, Oracle VM can use it for virtual machine connectivity, with access to and from data center public network. This subnet is configurable through the Network Setup tab in the Oracle Virtual Compute Appliance Dashboard. VLANs are not supported on this network.
- The **public virtual machine network** is a bonded Ethernet connection between the compute nodes. Oracle VM uses this network for virtual machine connectivity, where external access is required. VLAN 1 is automatically configured for this network. Customers can add their own VLANs to the Oracle VM

[1] It is possible that the other management node, in the rack unit just above, assumes the master role. In this case, the web page continues to display the message "Oracle Virtual Compute Appliance is still initializing... Please wait..." The administrator should connect to `http://192.168.4.4` instead.

network configuration, and define the subnet(s) appropriate for IP address assignment at the virtual machine level. For external connectivity, the next-level data center switches must be configured to accept your tagged VLAN traffic.

- The **private virtual machine network** is a bonded Ethernet connection between the compute nodes. Oracle VM uses this network for virtual machine connectivity, where only internal access is required. VLAN 1 is automatically configured for this network. Customers can add VLANs of their choice to the Oracle VM network configuration, and define the subnet(s) appropriate for IP address assignment at the virtual machine level.

Finally, the Oracle Fabric Interconnect F1-15 Director Switches also manage the physical public network connectivity of the Oracle Virtual Compute Appliance. Two 10GbE ports on each Fabric Director switch must be connected to redundant next-level data center switches. At the end of the initialization process, the administrator assigns three reserved IP addresses from the data center (public) network range to the management node cluster of the Oracle Virtual Compute Appliance: one for each management node, and an additional Virtual IP shared by the clustered nodes. From this point forward, the Virtual IP is used to connect to the master management node's web server, which hosts both the Oracle Virtual Compute Appliance Dashboard and the Oracle VM Manager web interface.

Caution

It is critical that **both** Oracle Fabric Interconnect F1-15 Director Switches have **two** 10GbE connections each to separate next-level data center switches. This configuration with four cross-connected cables provides redundancy and load splitting at the level of the Fabric Director switches, the 10GbE ports and the data center switches. In addition, it plays a key role in the continuation of service during failover scenarios involving Fabric Director switch outages and other components.

1.3 Software Components

This section describes the main software components the Oracle Virtual Compute Appliance uses for operation and configuration.

1.3.1 Oracle Virtual Compute Appliance Dashboard

The Oracle Virtual Compute Appliance provides its own web-based graphical user interface that can be used to perform a variety of administrative tasks specific to the appliance. The Oracle Virtual Compute Appliance Dashboard is a WebLogic application that is available via the active management node. It is installed on top of the Oracle WebLogic Server 11*g* that is packaged with Oracle VM Manager, as described in Section 1.3.3, “Oracle VM Manager”.

Use the Dashboard to perform the following tasks:

- Appliance system monitoring and component identification
- Monitoring and identifying physical network connections
- Initial configuration of management node networking data
- Resetting of the global password for Oracle Virtual Compute Appliance configuration components

The Oracle Virtual Compute Appliance Dashboard is described in detail in Chapter 2, *Monitoring and Managing Oracle Virtual Compute Appliance*.

1.3.2 Password Manager (Wallet)

All components of Oracle Virtual Compute Appliance have administrator accounts with a default password. After applying your data center network settings through the Oracle Virtual Compute Appliance Dashboard, it is recommended that you modify the default appliance password. The Network Setup tab allows you to set a new password. It is applied to all system configuration components, except for Oracle WebLogic Server.

Caution

The Oracle WebLogic Server password cannot be set from the Dashboard. Please change the password in the Oracle WebLogic Server Administration Console. Make sure it matches the password configured in the Wallet. Otherwise the Oracle Virtual Compute Appliance will not be able to connect to Oracle WebLogic Server. For details, see Section 6.9, “Changing Oracle WebLogic Server Passwords”.

Passwords for all accounts on all components are stored in a global Wallet, secured with 512-bit encryption. The password update functionality in the Dashboard is restricted to the Dashboard UI itself, Oracle VM Manager, the root user account on both management nodes, and the ovs user account of the Oracle VM mySQL database. It is possible to change the password for other accounts and components by setting the password manually and updating the Wallet entry from the command line of the master management node. For details, see Section 6.10, “Replacing Default Passwords Manually”.

1.3.3 Oracle VM Manager

All virtual machine management tasks are performed within Oracle VM Manager, a WebLogic application that is installed on each of the management nodes and which provides a web-based management user interface and a command line interface that allows you to manage your Oracle VM infrastructure within the Oracle Virtual Compute Appliance.

Oracle VM Manager is comprised of the following software components:

- **Oracle VM Manager application**: provided as an Oracle WebLogic Server domain and container.
- **Oracle WebLogic Server 11g**: including Application Development Framework (ADF) Release 11*g*, used to host and run the Oracle VM Manager application
- **MySQL 5.5 Enterprise Edition Server**: for the exclusive use of the Oracle VM Manager application as a management repository and installed on the Database file system hosted on the ZFS storage appliance.

Administration of virtual machines is performed using the Oracle VM Manager web user interface, as described in Chapter 3, *Managing the Oracle VM Virtual Infrastructure*. While it is possible to use the command line interface provided with Oracle VM Manager, this is considered an advanced activity that should only be performed with a thorough understanding of the limitations of Oracle VM Manager running in the context of an Oracle Virtual Compute Appliance.

1.3.4 Operating Systems

Hardware components of the Oracle Virtual Compute Appliance run their own operating systems:

- Management Nodes: Oracle Linux 6 with UEK2
- Compute Nodes: Oracle Linux 5 with UEK2
- Oracle ZFS Storage Appliance ZS3-ES: Oracle Solaris 11

All other components run a particular revision of their respective firmware. All operating software has been selected and developed to work together as part of the Oracle Virtual Compute Appliance. When an update is released, the appropriate versions of all software components are bundled. When a new software

release is activated, all component operating software is updated accordingly. You should not attempt to update individual components unless Oracle explicitly instructs you to.

1.3.5 Databases

The Oracle Virtual Compute Appliance uses a number of databases to track system states, handle configuration and provisioning, and for Oracle VM Manager. All databases are stored on the ZFS storage appliance, and are exported via an NFS file system. The databases are accessible to each management node to ensure high availability.

The following table provides a listing of each of the different databases used by the Oracle Virtual Compute Appliance.

Table 1.2 Oracle Virtual Compute Appliance Databases

Item	Description
Oracle Virtual Compute Appliance Node Database	Contains information on every compute node and management node in the rack, including the state used to drive the provisioning of compute nodes and data required to handle software updates. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/node` on the ZFS, accessible via `/nfs/shared_storage/db/node` on each management node
Oracle Fabric Interconnect Database	Contains IP and host name data for the Oracle Fabric Interconnect F1-15 Director Switches. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/infrastructure` on the ZFS, accessible via `/nfs/shared_storage/db/infrastructure` on each management node
Oracle Virtual Compute Appliance Netbundle Database	Predefines Ethernet and bond device names for all possible networks that can be configured throughout the system, and which are allocated dynamically. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/netbundle` on the ZFS, accessible via `/nfs/shared_storage/db/netbundle` on each management node
Oracle Switch ES1-24 Ports Database	Defines the factory-configured map of Oracle Switch ES1-24 ports to the rack unit or element to which that port is connected. It is used to map Oracle Switch ES1-24 ports to machine names. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/opus_ports` on the ZFS, accessible via `/nfs/shared_storage/db/opus_ports` on each management node
Oracle Virtual Compute Appliance DHCP Database	Contains information on the assignment of DHCP addresses to newly detected compute nodes. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/dhcp` on the ZFS, accessible via `/nfs/shared_storage/db/dhcp` on each management node

Item	Description
Oracle Virtual Compute Appliance Mini Database	A multi-purpose database used to map compute node hardware profiles to onboard disk size information. It also contains valid hardware configurations that servers must comply with in order to be accepted as an Oracle Virtual Compute Appliance component. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/mini_db` on the ZFS, accessible via `/nfs/shared_storage/db/mini_db` on each management node
Oracle Virtual Compute Appliance Setup Database	Contains the data set by the Oracle Virtual Compute Appliance Dashboard setup facility. The data in this database is automatically applied by both the active and standby management nodes when a change is detected. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/setup` on the ZFS, accessible via `/nfs/shared_storage/db/setup` on each management node
Oracle Virtual Compute Appliance Task Database	Contains state data for all of the asynchronous tasks that have been dispatched within the Oracle Virtual Compute Appliance. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/task` on the ZFS, accessible via `/nfs/shared_storage/db/task` on each management node
Oracle Virtual Compute Appliance Update Database	Used to track the two-node coordinated management node update process. **Type:** BerkeleyDB **Location:** `MGMT_ROOT/db/update` on the ZFS, accessible via `/nfs/shared_storage/db/update` on each management node
Oracle VM Manager Database	Used on each management node as the management database for Oracle VM Manager. It contains all configuration details of the Oracle VM environment (including servers, pools, storage and networking), as well as the virtualized systems hosted by the environment. **Type:** MySQL Database **Location:** `MGMT_ROOT/ovmm_mysql/data/` on the ZFS, accessible via `/nfs/shared_storage/ovmm_mysql/data/` on each management node

1.3.6 Oracle Virtual Compute Appliance Management Software

The Oracle Virtual Compute Appliance includes software that is designed for the provisioning, management and maintenance of all of the components within the appliance.

Important

This software is not designed for human interaction. All configuration and management tasks must be performed using the Oracle Virtual Compute Appliance Dashboard. Do not attempt to run any of these processes directly without explicit

instruction from an Oracle Support representative. Attempting to do so may render your appliance unusable.

This software largely consists of a number of Python applications that run on the active management node. These applications are found in `/usr/sbin` on each management node and are listed as follows:

- `ovca-backup`: the script responsible for performing backups of the appliance configuration as described in Section 1.6, “Oracle Virtual Compute Appliance Backup”
- `ovca-check-master`: a script that verifies which of the two management nodes currently has the master role
- `ovca-config`: a configuration script to define additional settings not available in the Oracle Virtual Compute Appliance Dashboard, as described in Section 1.3.7, “Oracle Virtual Compute Appliance Configuration Script”
- `ovca-daemon`: the core provisioning and management daemon for the Oracle Virtual Compute Appliance
- `ovca-dhcpd`: a helper script to assist the DHCP daemon with the registration of compute nodes
- `ovca-diag`: a tool to collect diagnostic information from your Oracle Virtual Compute Appliance, as described in Section 1.3.8, “Oracle Virtual Compute Appliance Diagnostics Tool”
- `ovca-factory-init`: the appliance initialization script used to set the appliance to its factory configuration
- `ovca-helper`: a support script used to perform particular configuration tasks and to assist with appliance configuration
- `ovca-node-db`: a script used to maintain and update the Oracle Virtual Compute Appliance Node Database described in Section 1.3.5, “Databases”
- `ovca-redirect`: a script to redirect HTTP or HTTPS requests to the Oracle Virtual Compute Appliance Dashboard described in Section 1.3.1, “Oracle Virtual Compute Appliance Dashboard”
- `ovca-remote-rpc`: a script that allows other components to communicate with the various management scripts available on the management node
- `ovca-rpc`: a script that allows the Oracle Virtual Compute Appliance Dashboard to communicate directly with the underlying management scripts running on the management node
- `ovca-update-password`: a script that controls password updates for each different component in the appliance
- `ovca-updater`: the script that allows you to download updated software for the Oracle Virtual Compute Appliance. It also allows you to activate the update, as described in Section 1.7, “Oracle Virtual Compute Appliance Software Update”

Many of these applications use a specific Oracle Virtual Compute Appliance library that is installed in `/usr/lib/python2.6/site-packages/ovca/` on each management node.

1.3.7 Oracle Virtual Compute Appliance Configuration Script

The Oracle Virtual Compute Appliance includes a configuration script that can be run to configure additional settings that are not catered for within the Oracle Virtual Compute Appliance Dashboard. This script is located in `/usr/sbin/` on each management node, and is named `ovca-config`.

The script allows you to configure proxy settings that allow the management nodes access to web-based or FTP-based resources on the Internet via a proxy server configured within your environment. See Section 6.1, “Adding Proxy Settings for Oracle Virtual Compute Appliance Updates” for more information.

The script also allows you to configure the log level, log path, log file size and number of log files for the Oracle Virtual Compute Appliance. These settings can be used to help troubleshoot problems and to assist with data gathering for support queries. See Section 6.2, “Setting the Oracle Virtual Compute Appliance Logging Parameters” for more information.

1.3.8 Oracle Virtual Compute Appliance Diagnostics Tool

The Oracle Virtual Compute Appliance includes a tool that can be run to collect diagnostic data: logs and other types of files that can help to troubleshoot hardware and software problems. This tool is located in `/usr/sbin/` on each management and compute node, and is named `ovca-diag`. The data it retrieves, depends on the selected command line arguments:

- `ovca-diag`

  When you enter this command, without any additional arguments, the tool retrieves a basic set of files that provide insights into the current health status of the Oracle Virtual Compute Appliance. You can run this command on all management and compute nodes. All collected data is stored in `/tmp`, compressed into a single tarball (`ovcadiag_<node-hostname>_<ID>_<date>_<time>.tar.bz2`).

- `ovca-diag version`

  When you enter this command, version information for the current Oracle Virtual Compute Appliance software stack is displayed. The `version` argument cannot be combined with any other argument.

- `ovca-diag ilom`

  When you enter this command, diagnostic data is retrieved, by means of `ipmitool`, through the ILOM of each component in the rack. The data set includes details about the host's operating system, processes, health status, hardware and software configuration, as well as a number of files specific to the Oracle Virtual Compute Appliance configuration. You can run this command on all management and compute nodes. All collected data is stored in `/tmp`, compressed into a single tarball (`ovcadiag_<node-hostname>_<ID>_<date>_<time>.tar.bz2`).

- `ovca-diag vmpinfo`

  Caution

  When using the `vmpinfo` argument, the command must be run from the master management node.

  When you enter this command, the Oracle VM diagnostic data collection mechanism is activated. The `vmpinfo3` script collects logs and configuration details from the Oracle VM Manager, and logs and `sosreport` information from each Oracle VM Server or compute node. All collected data is stored in `/tmp`, compressed into two tarballs: `ovcadiag_<node-hostname>_<ID>_<date>_<time>.tar.bz2` and `vmpinfo3-<version>-<date>-<time>.tar.gz`.

  To collect diagnostic information for a subset of the Oracle VM Servers in the environment, you run the command with an additional `servers` parameter: `ovca-diag vmpinfo servers='ovcacn07r1,ovcacn08r1,ovcacn09r1'`

Diagnostic collection with `ovca-diag` is possible from the command line of any node in the system. Only the master management node allows you to use all of the command line arguments. Although `vmpinfo`

is not available on the compute nodes, running `ovca-diag` directly on the compute can help retrieve important diagnostic information regarding Oracle VM Server that cannot be captured with `vmpinfo`. Running `ovca-diag` from different locations can be particularly helpful in debugging InfiniBand fabric issues.

The `ovca-diag` tool is typically run by multiple users with different roles. System administrators or field service engineers may use it as part of their standard operating procedures, or Oracle Support teams may request that the tool be run in a specific manner as part of an effort to diagnose and resolve reported hardware or software issues. For additional information and instructions, also refer to the section "Data Collection for Service and Support" in the Oracle Virtual Compute Appliance Release Notes.

1.4 Provisioning and Orchestration

As a converged infrastructure solution, the Oracle Virtual Compute Appliance aims to eliminate many of the intricacies of optimizing the system configuration. Hardware components are installed and cabled at the factory. Configuration settings and installation software are preloaded onto the system. Once the appliance is connected to the data center power source and public network, the provisioning process between the administrator pressing the power button of the first management node and the appliance reaching its *Deployment Readiness* state is entirely orchestrated by the master management node. This section explains what happens behind the curtains as the Oracle Virtual Compute Appliance is initialized and all nodes are provisioned.

1.4.1 Appliance Management Initialization

Boot Sequence and Health Checks

When power is applied to the first management node, it takes approximately five minutes for the server to boot. While the Oracle Linux 6 operating system is loading, an Apache web server is started, which serves a static welcome page the administrator can browse to from the workstation connected to the appliance management network.

The necessary Oracle Linux services are started as the server comes up to runlevel 3 (multi-user mode with networking). At this point, the management node executes a series of system health checks. It verifies that all expected infrastructure components are present on the appliance management network and in the correct predefined location, identified by the rack unit number and fixed IP address. Next, the management node probes the ZFS storage appliance for a management NFS export and a management iSCSI LUN with OCFS2 file system. The storage and its access groups have been configured at the factory. If the health checks reveal no problems, the `ocfs2` and `o2cb` services are started up automatically.

Management Cluster Setup

When the OCFS2 file system on the shared iSCSI LUN is ready, and the `o2cb` services have started successfully, the management nodes can join the cluster. In the meantime, the first management node has also started the second management node, which will come up with an identical configuration. Both management nodes eventually join the cluster, but the first management node will take an exclusive lock on the shared OCFS2 file system using Distributed Lock Management (DLM). The second management node remains in permanent standby and takes over the lock only in case the first management node goes down or otherwise releases its lock.

With mutual exclusion established between both members of the management cluster, the master management node continues to load the remaining Oracle Virtual Compute Appliance services, including dhcpd, Oracle VM Manager and the Oracle Virtual Compute Appliance databases. The virtual IP address of the management cluster is also brought online, and the Oracle Virtual Compute Appliance Dashboard is started within WebLogic. The static Apache web server now redirects to the Dashboard at the virtual IP, where the administrator can access a live view of the appliance rack component status.

Once the `dhcpd` service is started, the system state changes to *Provision Readiness*, which means it is ready to discover non-infrastructure components.

1.4.2 Compute Node Discovery and Provisioning

Node Manager

To discover compute nodes, the Node Manager on the master management node uses a DHCP server and the node database. The node database is a BerkeleyDB type database, located on the management NFS share, containing the state and configuration details of each node in the system, including MAC addresses, IP addresses and host names. The discovery process of a node begins with a DHCP request from the ILOM. Most discovery and provisioning actions are synchronous and occur sequentially, while time consuming installation and configuration processes are launched in parallel and asynchronously. The DHCP server hands out pre-assigned IP addresses on the appliance management network (`192.168.4.0/24`). When the Node Manager has verified that a node has a valid service tag for use with Oracle Virtual Compute Appliance, it launches a series of provisioning tasks. All required software resources have been loaded onto the ZFS storage appliance at the factory.

Provisioning Tasks

The provisioning process is tracked in the node database by means of status changes. The next provisioning task can only be started if the node status indicates that the previous task has completed successfully. For each valid node, the Node Manager begins by building a PXE configuration and forces the node to boot using Oracle Virtual Compute Appliance runtime services. After the hardware RAID-1 configuration is applied, the node is restarted to perform a kickstart installation of Oracle VM Server. Crucial kernel modules and host drivers for InfiniBand and IO Director support are added to the installation. At the end of the installation process, the network configuration files are updated to allow all necessary network interfaces and bonds to be brought up.

Now that the PVI for the Oracle VM management network exists, the compute node is rebooted one last time to reconfigure the Oracle VM Agent to communicate over the PVI. At this point, the node is ready for Oracle VM Manager discovery.

1.4.3 Server Pool Readiness

Oracle VM Server Pool

When the Node Manager detects a fully installed compute node that is ready to join the Oracle VM environment, it issues the necessary Oracle VM CLI commands to add the new node to the Oracle VM server pool. With the discovery of the first node, the system also configures the clustered Oracle VM server pool with the appropriate networking, access to the shared storage, and a virtual IP. For every compute node added to Oracle VM Manager the IPMI configuration is stored in order to enable convenient remote power-on/off.

Oracle Virtual Compute Appliance expects that all compute nodes in one rack belong to a single clustered server pool with High Availability (HA) and Distributed Resource Scheduling (DRS) enabled. When all compute nodes have joined the Oracle VM server pool, the appliance is in *Ready* state, meaning virtual machines (VMs) can be deployed.

Expansion Compute Nodes

When an expansion compute node is installed, its presence is detected based on the DHCP request from its ILOM. If the new server is identified as an Oracle Virtual Compute Appliance node, an entry is added in the node database with "*new*" state. This triggers the initialization and provisioning process. New

compute nodes are integrated seamlessly to expand the capacity of the running system, without the need for manual reconfiguration by an administrator.

1.5 High Availability

The Oracle Virtual Compute Appliance is designed for high availability at every level of its component make-up.

Management Node Failover

During the factory installation of an Oracle Virtual Compute Appliance, the management nodes are configured as a cluster. The cluster relies on an OCFS2 file system exported as a LUN from the ZFS storage to perform the heartbeat function and to store a lock file that each management node attempts to take control of. The management node that has control over the lock file automatically becomes the master or active node in the cluster.

When the Oracle Virtual Compute Appliance is first initialized, the `o2cb` service is started on each management node. This service is the default cluster stack for the OCFS2 file system. It includes a node manager that keeps track of the nodes in the cluster, a heartbeat agent to detect live nodes, a network agent for intra-cluster node communication and a distributed lock manager to keep track of lock resources. All these components are in-kernel.

Additionally, the `ovca` service is started on each management node. The management node that obtains control over the cluster lock and is thereby promoted to the master or active management node, runs the full complement of Oracle Virtual Compute Appliance services. This process also configures the Virtual IP, that is used to access the active management node, so that it is 'up' on the active management node and 'down' on the standby management node. This ensures that, when attempting to connect to the Virtual IP address that you configured for the management nodes, you are always accessing the active management node.

In the case where the active management node fails, the cluster detects the failure and the lock is released. Since the standby management node is constantly polling for control over the lock file, it detects when it has control of this file and the `ovca` service brings up all of the required Oracle Virtual Compute Appliance services. The Virtual IP on the standby management node is brought up as it is promoted to the active role.

When the management node that failed comes back online, it no longer has control of the cluster lock file. It is automatically put into standby mode, and the Virtual IP is configured as 'down'. This means that one of the two management nodes in the rack is always available via the same IP address and is always correctly configured. The management node failover process takes up to 5 minutes to complete.

Oracle VM Management Database Failover

The Oracle VM Manager database files are located on a shared file system exposed by the ZFS storage appliance. The active management node runs the MySQL database server, which accesses the database files on the shared storage. In the event that the management node fails, the standby management node is promoted and the MySQL database server on the promoted node is started so that the service can resume as normal. The database contents are available to the newly running MySQL database server.

Compute Node Failover

High availability of compute nodes within the Oracle Virtual Compute Appliance is enabled through the clustered server pool that is created automatically in Oracle VM Manager during the compute node provisioning process. Since the server pool is configured as a cluster using an underlying OCFS2 file

system, HA-enabled virtual machines running on any compute node can be migrated and restarted automatically on an alternate compute node in the event of failure.

Storage Redundancy

Further redundancy is provided through the use of the ZFS storage appliance to host storage. This component is configured to support RAID-Z2 providing integrated redundancy with a fault tolerance of up to two failed drives with zero data loss. Furthermore, the storage appliance includes two storage heads or controllers that are interconnected in a clustered configuration. In the event of failure, either storage head can continue handling traffic for the other without an interruption in service.

Network Redundancy

All of the customer-usable networking within the Oracle Virtual Compute Appliance is configured for redundancy. Only the internal administrative Ethernet network, which is used for initialization and ILOM connectivity, is not redundant. There are two of each switch type to ensure that there is no single point of failure. Networking cabling is equally duplicated and switches are interconnected as described in Section 1.2.4, “Network Infrastructure”.

1.6 Oracle Virtual Compute Appliance Backup

The configuration of all components within Oracle Virtual Compute Appliance is automatically backed up and stored on the ZFS storage appliance as a set of archives. Backups are named with a time stamp for when the backup is run.

During initialization, a crontab entry is created on each management node to perform a global backup twice in every 24 hours. The first backup runs at 09h00 and the second at 21h00. Only the active management node actually runs the backup process when it is triggered.

Backups are stored on the `MGMT_ROOT` file system on the ZFS storage appliance and are accessible on each management node at `/nfs/shared_storage/backups`. When the backup process is triggered, it creates a directory named with the time stamp for the current backup process. Within this directory several subdirectories are also created:

- **nm2**: contains the NM2-36P Sun Datacenter InfiniBand Expansion Switch configuration data
- **opus**: contains the Oracle Switch ES1-24 configuration data
- **ovca**: contains all of the configuration information relevant to the deployment of the management nodes such as the password wallet, the network configuration of the management nodes, configuration databases for the Oracle Virtual Compute Appliance services, and DHCP configuration.
- **ovmm**: contains the most recent backup of the Oracle VM Manager database, the actual source data files for the current database, and the UUID information for the Oracle VM Manager installation. Note that the actual backup process for the Oracle VM Manager database is handled automatically from within Oracle VM Manager and is described in detail in the section entitled Oracle VM Manager MySQL Backup, in the Oracle VM Installation and Upgrade Guide.
- **xsigo**: contains the configuration data for the Oracle Fabric Interconnect F1-15 Director Switches.
- **zfssa**: contains all of the configuration information for the ZFS storage appliance

The backup process collects data for each component in the appliance and ensures that it is stored in a way that makes it easy to restore that component to operation in the case of failure [2] .

[2] Restoration from backup must only be performed by Oracle Service Personnel.

Taking regular backups is standard operating procedure for any production system. The internal backup mechanism cannot protect against full system failure, site outage or disaster. Therefore, you should consider implementing a backup strategy to copy key system data to external storage. This requires a machine with connections to the internal appliance networks as well as the external (public) data center network.

For a detailed description of the backup contents, and for guidelines to export internal backups outside the appliance, refer to the Oracle technical white paper entitled *Oracle Virtual Compute Appliance Backup and Recovery Guide*.

1.7 Oracle Virtual Compute Appliance Software Update

Oracle Virtual Compute Appliance includes the tools required to perform a full software update of the appliance. On the master management node command line, commands are issued to download a new version of the software stack from a specified URI and update all components to the latest version. For step-by-step instructions, see Section 2.5, “Update”.

An Oracle Virtual Compute Appliance software stack image is provided in the form of a zip file, approximately 4.6 GB in size. The zip file contains an automatically built ISO with the latest software updates from Oracle.

The software image can be downloaded using the FTP, HTTP or HTTPS protocols [3] . Once the image has been downloaded it is extracted into the `mgmt_image`, `hmp_image` and `ovm_image` subdirectories of `/nfs/shared_storage`, which resides in the `MGMT_ROOT` file system on the ZFS storage appliance.

From the command line, you are able to *activate* a downloaded software image. Activation starts a coordinated process on the management nodes that relies on management node failover to succeed.

The activation process can be summarized in the following way:

- The current master begins the process by creating a database entry to include a message containing the version number of the software that you are updating to; a time stamp and the node name of the inactive management node.
- The current master reboots the inactive management node and provisions it with the new software image in the same way that a compute node is provisioned at start-up. The current software on the inactive management node is wiped and the new software is installed directly from the ISO stored in `/nfs/shared_storage/mgmt_image` on the storage appliance.
- After the install, the management node is rebooted and starts its *ovca* service. This causes it to re-enter the remaster code and it finalizes its own database entry.
- The current master detects the database update indicating that the installation has completed and the newly installed management node is ready to resume service as the new master. It creates its own database entry to indicate that it is now being updated, and then reboots.
- The newly installed management node is promoted to the cluster master and then proceeds to perform the provisioning required to install the new software image on the rebooting management node.
- When installation is complete, the management node is rebooted and comes up in standby mode.

[3] It may be necessary to edit `/etc/ovca.conf`, on each management node, to ensure that the correct proxy settings are specified for the download to succeed. See Section 6.1, “Adding Proxy Settings for Oracle Virtual Compute Appliance Updates” for more information.

Chapter 2 Monitoring and Managing Oracle Virtual Compute Appliance

Table of Contents

Monitoring and management of the Oracle Virtual Compute Appliance is achieved using the Oracle Virtual Compute Appliance Dashboard. This web-based graphical user interface is also used to perform the initial configuration of the appliance beyond the instructions provided in the Quick Start poster included in the packaging of the appliance.

Warning

Before starting the system and applying the initial configuration, read and understand the Oracle Virtual Compute Appliance Release Notes. The section Known Limitations and Workarounds provides information that is critical for correctly executing the procedures in this document. Ignoring the release notes may cause you to configure the system incorrectly. Bringing the system back to normal operation may require a complete factory reset.

The Oracle Virtual Compute Appliance Dashboard allows you to perform the following tasks:

- Initial software configuration for the appliance using the Network Setup tab, as described in Section 2.4, “Network Setup”.
- Hardware monitoring and identification of each hardware component used in the appliance, accessed via the Hardware View tab described in Section 2.2, “Hardware View”.
- Physical network monitoring and identification via the Network View tab described in Section 2.3, “Network View”.
- Reconfiguration of appliance software, such as resetting the global password used for different components within the appliance, via the Network Setup tab, as described in Section 2.4, “Network Setup”.

The Oracle Virtual Compute Appliance software includes functionality that is currently not available through the Dashboard user interface:

- **Backup**

  The configuration of all components within Oracle Virtual Compute Appliance is automatically backed up based on a crontab entry. This functionality is not configurable. Restoring a backup requires the intervention of an Oracle-qualified service person. For details, see Section 1.6, “Oracle Virtual Compute Appliance Backup”.

- **Update**

The update process is controlled from the command line of the master management node. For details, see Section 1.7, “Oracle Virtual Compute Appliance Software Update”. For step-by-step instructions, see Section 2.5, “Update”.

2.1 Connecting and Logging in to the Oracle Virtual Compute Appliance Dashboard

To open the Login page of the Oracle Virtual Compute Appliance Dashboard, enter the following address in a Web browser:

https://*manager-vip*:7002/ovca

Where, *manager-vip* refers to the shared Virtual IP address that you have configured for your management nodes during installation. By using the shared Virtual IP address, you ensure that you always access the Oracle Virtual Compute Appliance Dashboard on the active management node. [1] .

Important

You must ensure that if you are accessing Oracle Virtual Compute Appliance Dashboard through a firewalled connection, the firewall is configured to allow TCP traffic on the port that the Oracle Virtual Compute Appliance Dashboard is using to listen for connections.

Enter your Oracle Virtual Compute Appliance Dashboard administration user name in the **Username** field. This is the administration user name you configured during installation. Enter the password for the Oracle Virtual Compute Appliance Dashboard administration user name in the **Password** field [2] .

Important

The Oracle Virtual Compute Appliance Dashboard makes use of cookies in order to store session data. Therefore, to successfully login and use the Oracle Virtual Compute Appliance Dashboard your web browser must accept cookies from the Oracle Virtual Compute Appliance Dashboard host.

2.2 Hardware View

The **Hardware View** within the Oracle Virtual Compute Appliance Dashboard provides a graphical representation of the hardware components as they are installed within the rack. Rolling over each item with the mouse raises a pop-up window providing the name of the component, its type, and a summary of configuration and status information. For compute nodes, the pop-up window includes a Reprovision button, which allows you to restart the provisioning process if the node becomes stuck in an intermittent state or goes into error status before it is added to the Oracle VM server pool. Instructions to reprovision a compute node are provided in Section 6.12, “A Compute Node Fails to Complete Provisioning”.

Caution

The Reprovision button is to be used *only* for compute nodes that fail to complete provisioning. For compute nodes that have been provisioned properly and/or host

[1] If you are following the installation process and this is your first time accessing the Oracle Virtual Compute Appliance Dashboard, the Virtual IP address still needs to be configured and the Dashboard is not available on the public network. In this case, your workstation must be patched directly into the Oracle Switch ES1-24, using the supplied blue Ethernet cable connected to port 24. (Or use port 19 of the switch on the right if 100 Mbit/s transfer rate is required.) The *IP* that should be used in the URL to connect to the Dashboard is `192.168.4.3` or `192.168.4.4` , depending on which management node assumes the master role.

[2] If you are following the installation process and this is your first time accessing the Oracle Virtual Compute Appliance Dashboard, the default user name is **ovcaadmin** and the default password is **Welcome1**.

running virtual machines, the Reprovision button is made unavailable to prevent incorrect use, thus protecting healthy compute nodes from loss of functionality, data corruption, or being locked out of the environment permanently.

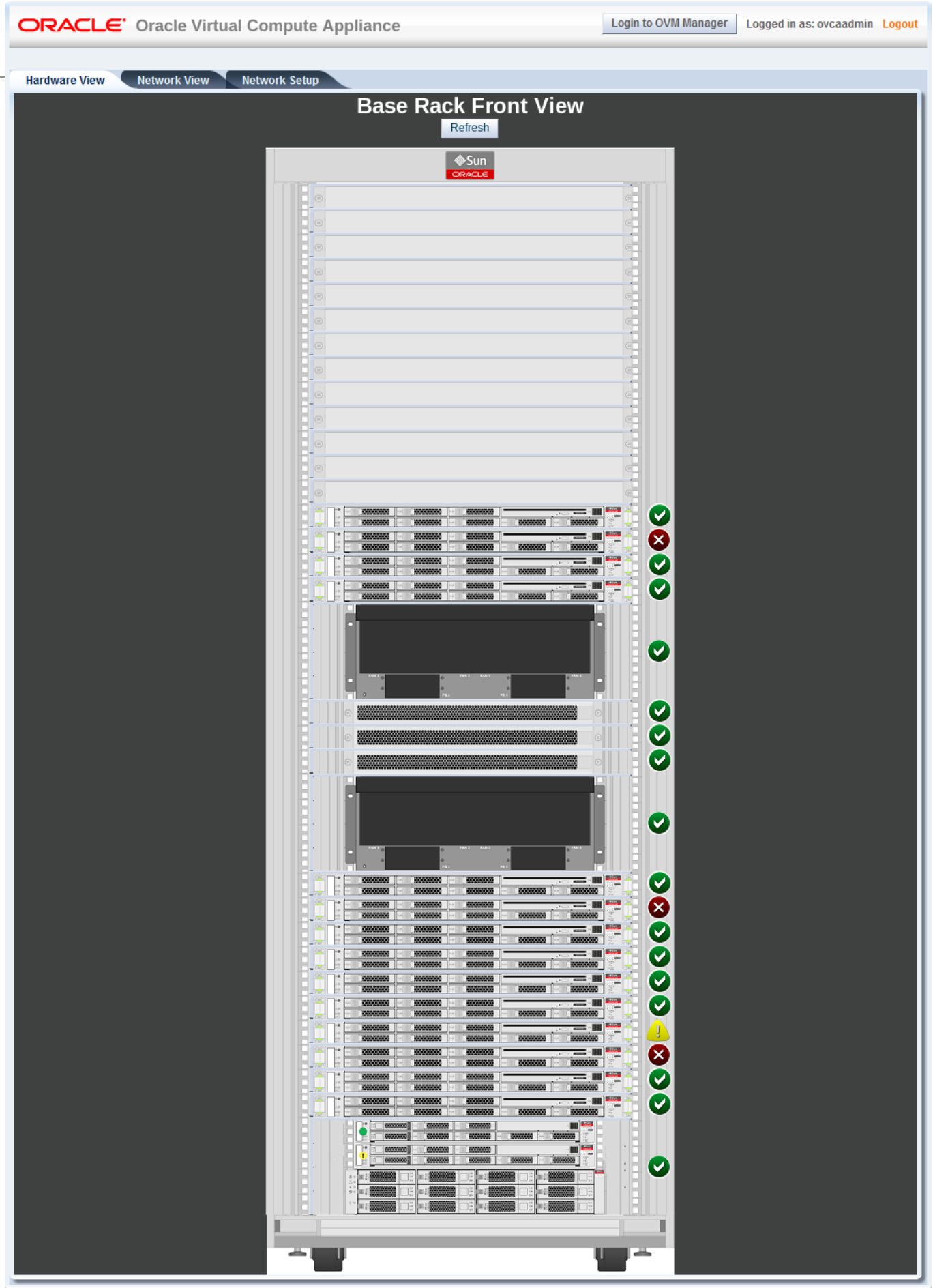
Alongside each installed component within the appliance rack, a status icon provides an indication of the health and running status of the component. See Table 2.1 for an overview of the different status icons and their meaning.

Table 2.1 Table of Hardware Status Icons

Icon	Status	Description
	OK	The component is running correctly and has passed all health check operations.
	Warning	The component is running, but has not passed all health check operations and investigation may be required.
	Error	The component is not running and has failed health check operations. Component troubleshooting is required and the component may need to be replaced.

If either of the Oracle Fabric Interconnect F1-15 Director Switches is clicked on in the Hardware View, the view is changed to the I/O Ports tab in the Network View. See Section 2.3, “Network View” for more information.

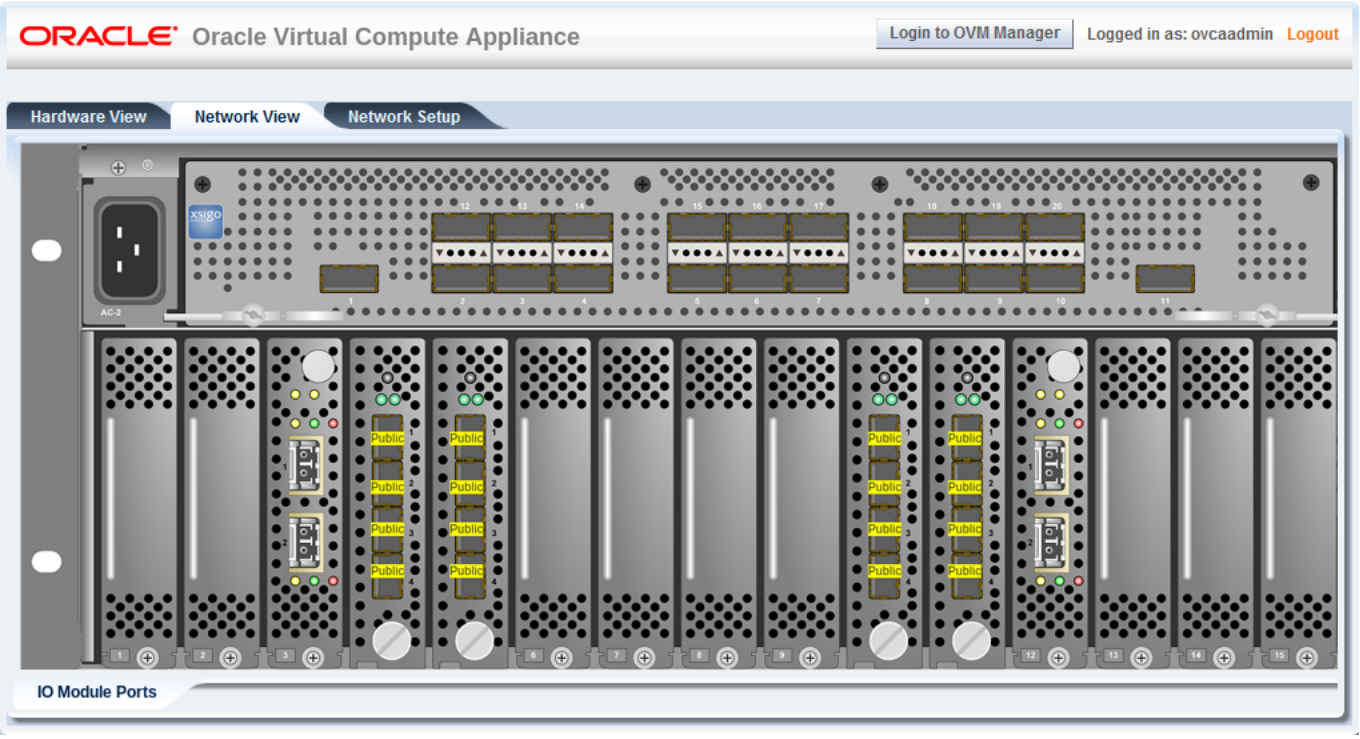
The Hardware View provides an accessible tool for troubleshooting hardware components within the Oracle Virtual Compute Appliance and identifying where these components are actually located within the rack. Where components might need replacing, the new component must take the position of the old component within the rack to maintain configuration.


ORACLE Oracle Virtual Compute Appliance
Login to OVM Manager
Logged in as: ovcaadmin
Logout
Hardware View
Network View
Network Setup
Base Rack Front View
Refresh
Sun
ORACLE

2.3 Network View

The **Network View** provides a graphical representation of the networking hardware within the Oracle Virtual Compute Appliance rack. Specifically, the I/O modules and their network ports on the are shown on a diagram depicting the back panel of the Oracle Fabric Interconnect F1-15 Director Switch.

Figure 2.2 Network View - IO Module Ports



2.4 Network Setup

The **Network Setup** tab is used to configure networking and service information for the management nodes. The following fields are available for configuration:

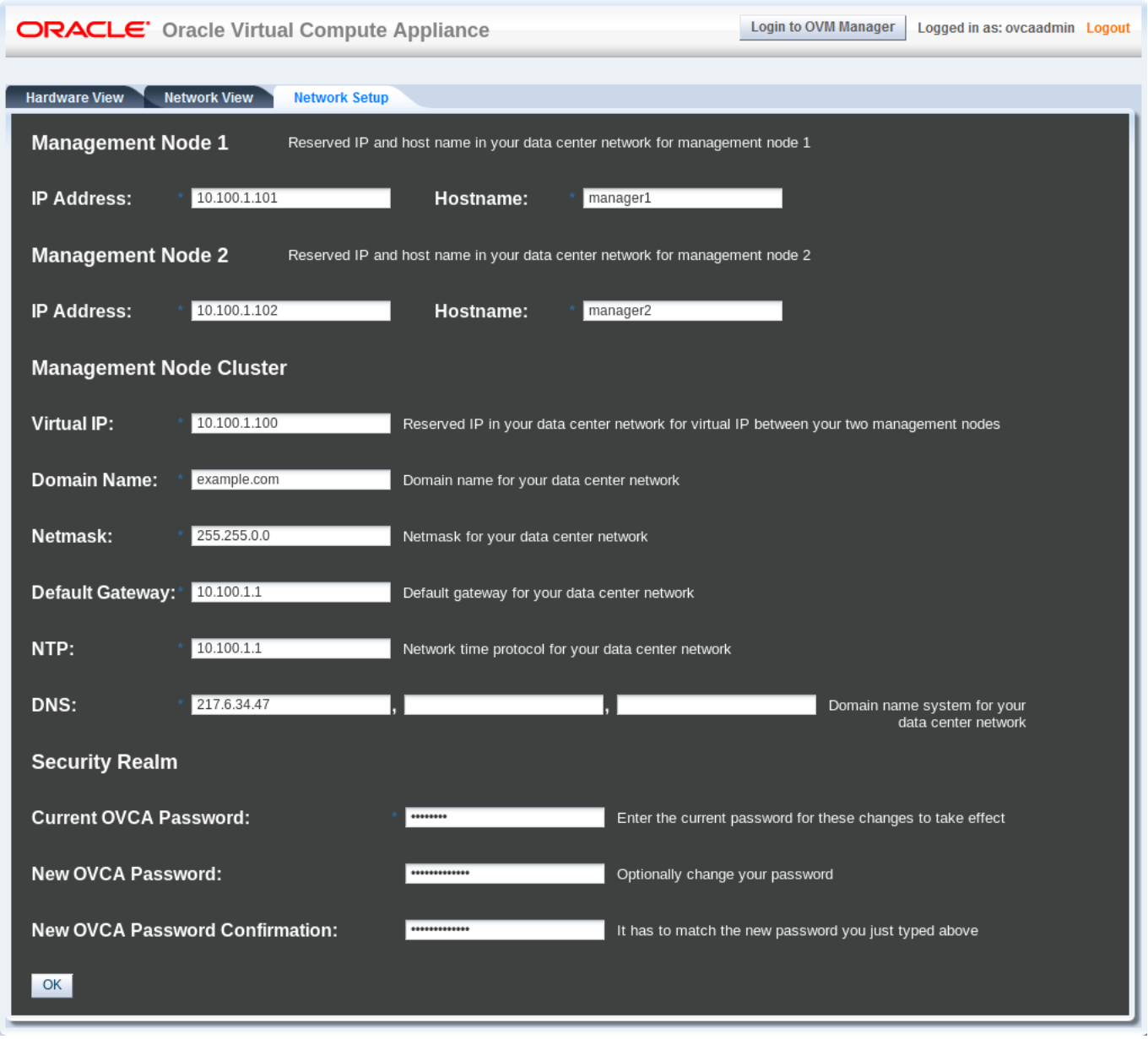
- **Management Node 1:** Use this field to specify an IP address within your datacenter network that can be used to directly access this management node.
  - **Hostname:** Use this field to specify the host name for the first management node system.
- **Management Node 2:** Use this field to specify an IP address within your datacenter network that can be used to directly access this management node.
  - **Hostname:** Use this field to specify the host name for the second management node system.
- **Domain Name:** Use this field to specify the domain that each of the management node systems belong to.
- **Virtual IP:** Use this field to specify the shared Virtual IP address that is used to always access the active management node. This IP address must be in the same subnet as the IP addresses that you have specified for each management node.
- **Netmask:** Use this field to specify the netmask for the network that the Virtual IP address and management node IP addresses belong to.

- **Default Gateway:** Use this field to specify the default gateway for the network that the Virtual IP address and management node IP addresses belong to.
- **NTP:** Use this field to specify the NTP server that the management nodes and other appliance components must use to synchronize their clocks to.
- **DNS:** Use the fields provided here to specify at least one DNS server that the management nodes can use for domain name resolution.
- **Current OVCA Password:** If changing the Oracle Virtual Compute Appliance password, it is necessary to provide the current password in this field before specifying the new password in the OVCA Password field.
- **OVCA Password:** Use this field to provide a new global Oracle Virtual Compute Appliance password, to reset the password used for all system configuration components.
- **OVCA Password Confirmation:** Use this field to confirm the new Oracle Virtual Compute Appliance password and check that you have not mis-typed what you intended.

Clicking the OK button at the bottom of the page saves the settings that are currently displayed on the page and updates the configuration on each of the management nodes. The `ovca` services are restarted in the process, so you are required to log back in to the Dashboard afterwards.

If you used this form to reset the Oracle Virtual Compute Appliance password, every appliance configuration component is updated with the same password, except for the Oracle WebLogic Server, which must be changed manually. For information about password management, see Section 1.3.2, “Password Manager (Wallet)”. For instructions to change the Oracle WebLogic Server password, see Section 6.9, “Changing Oracle WebLogic Server Passwords”.

Figure 2.3 Network Setup



2.5 Update

Updates of the Oracle Virtual Compute Appliance are performed from the command line of the master management node. Software updates are a three-tier process. First, a zipped ISO containing the updated software must be downloaded from MOS and made available on an HTTP or FTP server. From there, the ISO is downloaded to the ZFS storage appliance. When the download is complete and the software is unpacked in the appropriate directories, the update is activated and applied to each affected component.

Caution

If direct public access is not available within your data center and you make use of proxy servers to facilitate HTTP, HTTPS and FTP traffic, it may be necessary to edit `/etc/ovca.conf`, on each management node, to ensure that the correct proxy

settings are specified for a download to succeed from the Internet. This depends on the network location from where the download is served. See Section 6.1, “Adding Proxy Settings for Oracle Virtual Compute Appliance Updates” for more information.

Tip

Updates are controlled with `ovca-updater` commands. To display usage options, enter `ovca-updater --help` at the shell prompt of the management node.

Updating the Oracle Virtual Compute Appliance Software

1. Log into My Oracle Support and download the required Oracle Virtual Compute Appliance software update.

   You can find the update by searching for the product name “Oracle Virtual Compute Appliance”, or for the Patch or Bug Number associated with the update you need.

2. Make the update, a zipped ISO, available on an HTTP or FTP server that is reachable from your Oracle Virtual Compute Appliance.

3. Using SSH and an account with superuser privileges, log into the management node.

   Note

   The default `root` password is *Welcome1*.

4. Connect to the management node using its IP address in the data center network, as you configured it in the Network Setup tab of the Oracle Virtual Compute Appliance Dashboard. For details, see Section 2.4, “Network Setup”.

   Note

   The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
root@ovcamn05r1 ~]#
```

5. Download the ISO to your Oracle Virtual Compute Appliance.

```
# ovca-updater -m download -s -u http://download-url.example.com/ovca-version-build.iso.zip
Download of http://download-url.example.com/ovca-version-build.iso.zip started successfully. \
Task id is 5ba4f1a09c9546b29a560e3d6682ce67
```

6. Check the progress of the ISO download. When the download is finished, proceed with the next step.

```
# ovca-updater -m download -l -i 5ba4f1a09c9546b29a560e3d6682ce67
Task ID                           Pct   Elapsed time Status
5ba4f1a09c9546b29a560e3d6682ce67  60%   155.305 sec    RUNNING
# ovca-updater -m download -l -i 5ba4f1a09c9546b29a560e3d6682ce67
Task ID                           Pct   Elapsed time Status
5ba4f1a09c9546b29a560e3d6682ce67  70%   285.904 sec    RUNNING
# ovca-updater -m download -l -i 5ba4f1a09c9546b29a560e3d6682ce67
Task ID                           Pct   Elapsed time Status
5ba4f1a09c9546b29a560e3d6682ce67 100%   338.102 sec    SUCCESS
```

   To list all downloads and their status, enter this command:

```
# ovca-updater -m download -l
```

```
Task ID                           Pct   Elapsed time Status
5ba4f1a09c9546b29a560e3d6682ce67 100%   338.102 sec    SUCCESS
```

7. When the download has completed successfully, activate it by launching the update process.

```
# ovca-updater -m update -s
WARNING:root:Activating update process. Starting with nonmaster node 192.168.4.4
```

Once you issue this command, the update process is initiated as described in Section 1.7, “Oracle Virtual Compute Appliance Software Update”.

8. Check the progress of the software update.

```
# ovca-updater -m update -l
Mgmt Node IP    Update Started      Update Ended        Elapsed
192.168.4.4     2013-10-02 16:52:14 ------------------- 0:02:18
```

Note

At a certain point during the update process, the active management node is rebooted. As a result, the SSH connection is lost. In addition, this may cause the Dashboard to become unresponsive temporarily, and you may be required to log back in.

When the master management node reboots, the secondary (updated) management node assumes the master role. The original master management node is then also updated and becomes the backup management node.

Warning

When updating the Oracle Virtual Compute Appliance software stack from Release 1.0.2 to Release 1.1.1, you must verify that the specific Oracle VM Manager tuning has been applied properly. If Oracle VM Manager is using default settings instead, you must re-apply the tuning settings by running a script on the master management node. For step-by-step instructions, refer to Section 6.4, “Verifying and Re-applying Oracle VM Manager Tuning after Software Update”.

Warning

When updating the Oracle Virtual Compute Appliance software stack from Release 1.0.2 to Release 1.1.1, you must perform a critical upgrade procedure on each compute node that was originally provisioned with Release 1.0.2 software. The extra procedure is designed to correct the storage and clustered server pool configuration used by the compute nodes, while keeping the hosted virtual machines intact. For step-by-step instructions, refer to Section 6.5, “Upgrading Existing Compute Node Configuration to Release 1.1.1”.

Chapter 3 Managing the Oracle VM Virtual Infrastructure

Table of Contents

Warning

Access to the Oracle VM Manager web user interface and command line interface is provided without restrictions. The configuration of Oracle Virtual Compute Appliance components within Oracle VM Manager is automatic and handled by the Oracle Virtual Compute Appliance provisioning process. Altering the configuration of these components directly within Oracle VM Manager is not supported and may result in the malfunction of the appliance.

Use of Oracle VM Manager in the context of Oracle Virtual Compute Appliance should be limited to the management and creation of virtual machines.

Configuring additional storage, creating repositories, and setting up additional networks specifically for the use of virtual machines is possible. However, this should be done carefully, to avoid disrupting the configuration specific to the Oracle Virtual Compute Appliance.

Management of virtual machines and your Oracle VM environment is achieved using the Oracle VM Manager Web UI (User Interface). While Oracle VM Manager does provide a command line interface, use of this on your Oracle Virtual Compute Appliance should only be attempted by advanced users with a thorough understanding of Oracle VM and the limitations of its usage within an Oracle Virtual Compute Appliance context.

The information provided in here, is a description of the Oracle VM Manager Web UI within the context of the Oracle Virtual Compute Appliance. Where particular actions within the Oracle VM Manager Web UI are referenced, a link to the appropriate section within the Oracle VM User's Guide is provided. The complete Oracle VM User's Guide is available at this URL: http://docs.oracle.com/cd/E35328_01/E35332/html/index.html.

Note

When consulting the Oracle VM documentation directly, keep in mind the limitations imposed by using it within Oracle Virtual Compute Appliance.

The Oracle VM Manager Web UI is available via the IP address that you configured for your management nodes during installation. This virtual IP address is automatically assigned to whichever management node is currently the active node within the cluster. If the management node becomes unavailable, the

standby management node is promoted to the active role and takes over the IP address automatically. See Section 1.5, “High Availability” for more information on management node failover.

The Oracle VM Manager Web UI is configured to listen for HTTPS requests on port 7002.

3.1 Guidelines and Limitations

The Oracle VM Manager Web User Interface is provided without any software limitation to its functionality. Once your appliance has been provisioned, the Oracle VM environment is fully configured and ready to use for the deployment and management of your virtual machines. In this section, the operations that are explicitly not permitted, and those that may be attempted with due care, are presented as guidelines and limitations that should be followed when working within Oracle VM Manager.

The following actions must not be performed, except if Oracle gives specific instructions to do so.

Do Not:

- attempt to discover or modify or remove servers or their configuration;
- attempt to add or modify or remove server pools or their configuration;
- attempt to move servers out of the existing server pool;
- attempt to add or modify or remove affinity groups or server processor compatibility groups;
- attempt to modify or remove the existing repository named **Rack1-repository**, or the local disk repositories;
- attempt to delete or modify any of the preconfigured networks;
- attempt to connect virtual machines to the appliance management network;
- attempt to add or configure VLAN Groups, except to add VLAN tags to the default VLAN Group configuration;
- attempt to modify or delete any existing Storage elements that are already configured within Oracle VM;
- attempt to configure global settings in the **Tools and Resources** tab, such as the NTP or YUM Update configuration.

While unlikely to cause a problem with your appliance, the following actions are not recommended:

Not Recommended:

- configure additional external storage for Oracle VM Manager;
- add an additional repository within Oracle VM Manager;
- add or configure additional networks within Oracle VM Manager;
- use the Oracle VM Manager Command Line Interface or Utilities.

If you ignore this advice, the Oracle Virtual Compute Appliance automation, which uses specific naming conventions to label and manage assets, may fail. Out-of-band configuration changes would not be known to the orchestration software of the Oracle Virtual Compute Appliance.

3.2 Logging in to the Oracle VM Manager Web UI

To open the Login page of the Oracle VM Manager Web UI, enter the following address in a Web browser:

https://*manager-vip*:7002/ovm/console

Where, *manager-vip* refers to the virtual IP address, or corresponding host name, that you have configured for your management nodes during installation. By using the virtual IP address, you ensure that you always access the Oracle VM Manager Web UI on the active management node.

Important

You must ensure that if you are accessing Oracle VM Manager through a firewalled connection, the firewall is configured to allow TCP traffic on the port that Oracle VM Manager is using to listen for connections.

Enter your Oracle VM Manager administration user name in the **Username** field. This is the administration user name you configured during installation. Enter the password for the Oracle VM Manager administration user name in the **Password** field.

Important

The Oracle VM Manager Web UI makes use of cookies in order to store session data. Therefore, to successfully log in and use the Oracle VM Manager Web UI your web browser must accept cookies from the Oracle VM Manager host.

3.3 Monitoring Health and Performance in Oracle VM

The **Health** tab provides a view of the health of the compute nodes and the server pool within your environment. This information complements the Hardware View provided in the Oracle Virtual Compute Appliance Dashboard. See Section 2.2, “Hardware View” for more information.

The **Statistics** subtab available on the Health tab provides statistical information, including real-time graphs, for CPU and memory usage. These statistics can be viewed at a global scale to determine overall usage, per server to see the performance of each individual compute node, or per virtual machine to help track the usage and resource requirements for any of the virtual machines within your environment.

For detailed information on using the Health tab, please refer to the section entitled Health Tab in the Oracle VM User's Guide.

3.4 Creating and Managing Virtual Machines

The **Servers and VMs** tab is used to create and manage your virtual machines. By default, compute nodes are listed as belonging to a single server pool called **Rack1_ServerPool**. The configuration of this server pool must not be altered. There is no need to discover servers, as compute nodes are automatically provisioned and discovered within an Oracle Virtual Compute Appliance. Editing the configuration of the server pool, servers, affinity groups and processor compatibility groups is not supported. The primary purpose of this tab within the Oracle Virtual Compute Appliance context is to create and manage your virtual machines.

Virtual machines can be created using:

- ISO files in a repository (hardware virtualized only)
- Mounted ISO files on an NFS, HTTP or FTP server (paravirtualized only)
- Virtual machine templates (by cloning a template)
- Existing virtual machines (by cloning a virtual machine)

- Virtual machine assemblies

Virtual machines require most installation resources to be located in the storage repository, managed by Oracle VM Manager, with the exception of mounted ISO files for paravirtualized guests. See Section 3.5, “Managing Virtual Machine Resources” for more information on importing these resources into the Oracle Virtual Compute Appliance repository.

Before you create a virtual machine that requires network connectivity, or a paravirtualized machine which requires network connectivity to perform the operating system install, you must generate virtual network interfaces using the VNIC Manager. See Section 3.6, “Configuring Network Resources for Virtual Machines” for information on using the VNIC Manager.

The following list provides an outline of actions that you can perform in this tab, with links to the relevant documentation within the Oracle VM User's Guide:

Managing Virtual Machines

- Create a virtual machine

  You can create a virtual machine following the instructions provided in the section entitled Creating a Virtual Machine.

  You do not need to create any additional server pools. You need only ensure that your installation media has been correctly imported into the Oracle Virtual Compute Appliance repository.

- View virtual machine information and events

  You can view information about your virtual machine or access virtual machine events by following the information outlined in the section entitled Viewing Virtual Machine Information and Events.

- Edit a virtual machine

  You can edit virtual machine parameters as described in the section entitled Editing a Virtual Machine.

  You can also convert a virtual machine to use paravirtualization. This involves making changes to the virtual machine itself, and then editing its Oracle VM Domain Type. Refer to the section entitled Converting to Paravirtualized Guests or Installing Paravirtualized Drivers for information on converting a virtual machine to use paravirtualization.

- Start a virtual machine

  Further information is provided in the section entitled Starting Virtual Machines.

- Stop a virtual machine

  Further information is provided in the section entitled Stopping (Shutting Down) Virtual Machines.

- Kill a virtual machine

  Further information is provided in the section entitled Killing Virtual Machines.

- Restart a virtual machine

  Further information is provided in the section entitled Restarting Virtual Machines.

- Suspend a virtual machine

  Further information is provided in the section entitled Suspending Virtual Machines.

- Resume a virtual machine

  Further information is provided in the section entitled Resuming a Virtual Machine.

- Move a virtual machine between repositories

  It is possible to create alternate repositories using external storage, however this configuration is beyond the scope of a normal Oracle Virtual Compute Appliance configuration and is not recommended. If you have chosen to create an alternate repository, this function can be used to move a virtual machine from one repository to another. It is important to understand that virtual machines hosted on alternate repositories are outside of the scope of your support agreement. Refer to the section entitled Moving Virtual Machines Between Repositories for more information.

- Move a virtual machine from one server to another

  Further information is provided in the section entitled Moving Virtual Machines Between Oracle VM Servers.

- Move a virtual machine to or from the Unassigned Virtual Machines folder

  Further information is provided in the section entitled Moving Virtual Machines To/From Unassigned Virtual Machines Folder.

- Migrate a virtual machine

  Since there is only a single server pool available in an Oracle Virtual Compute Appliance base rack, migration of virtual machines can only be achieved between servers and between a server and the Unassigned Virtual Machines folder. Modifying Server Processor Compatibility Groups is not permitted.

  Note

  Compute nodes of different hardware generations operate within the same server pool but belong to different CPU compatibility groups. Since live migration between CPU compatibility groups is not supported, virtual machines have to be cold-migrated between a Sun Server X3-2 and Sun Server X4-2 compute node. For more information about CPU compatibility groups, please refer to the section entitle Server Processor Compatibility Groups.

  Information on migrating virtual machines is provided in the section entitled Migrating Virtual Machines.

- Delete a virtual machine

  Further information is provided in the section entitled Deleting Virtual Machines.

- Send a message to a virtual machine

  If you have installed Oracle VM Guest Additions within your virtual machine, you can use the Oracle VM Messaging framework to send messages to your virtual machines to trigger actions within a virtual machine. Refer to the section entitled Sending Messages to Virtual Machines for more information.

- Connect to a virtual machine console

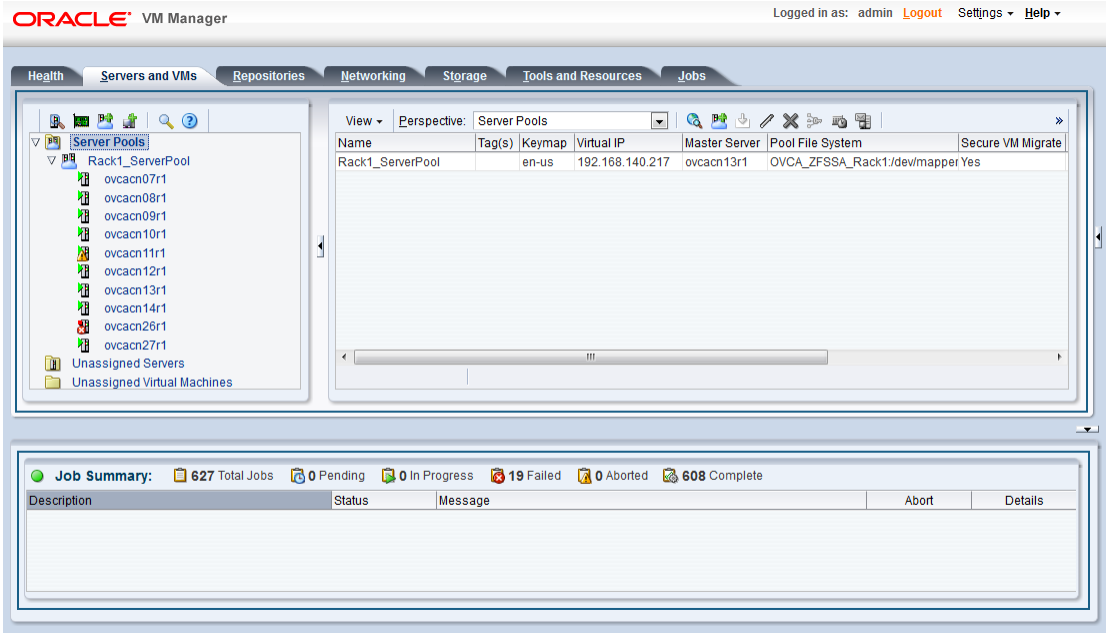
  Further information is provided in the section entitled Connecting to a Virtual Machine.

Monitoring Compute Node Information and Events

- View Oracle VM Server information and events

For more information on the options available to you, refer to the section entitled Viewing Oracle VM Server Information and Events.

Figure 3.1 A view of the Servers and VMs tab



3.5 Managing Virtual Machine Resources

The **Repositories** tab provides a view of the Oracle Virtual Compute Appliance repository. By default, a shared repository is configured on the ZFS storage appliance and named **Rack1-repository**. Additional local repositories are configured using the free disk space of each compute node. None of the default repository configurations may be altered.

Caution

Using local storage on the compute nodes has implications that you should take into account when planning the deployment of your virtual environment. For example:

- Virtual machines with resources in a local storage repository cannot be migrated to another compute node.
- Templates, assemblies and ISOs in local storage repositories cannot be used to create virtual machines on another compute node.
- If a compute node becomes unavailable, its locally stored virtual machines and resources cannot be restored or migrated to another compute node for continued service.
- The virtual machines and resources in local storage repositories are not protected by automatic failover and high-availability mechanisms normally offered by a clustered Oracle VM server pool with shared storage repository.

The Repositories tab is used to manage virtual machine resources, such as installation media and virtual disks. From this tab, it is possible to create, import or clone Oracle VM templates, assemblies and ISO

image files. It is also possible to create, modify, or clone virtual disks here. The following list provides an outline of actions that you can perform in this tab, with links to the relevant documentation within the Oracle VM User's Guide:

- Manage Virtual Machine Templates
  - Import a template
  - Create a template
  - Edit a template
  - Delete a template
  - Clone a template
  - Move a template
  - Manage a template clone customizer

  All documentation for these actions can be found in the section entitled Virtual Machine Templates.
- Manage Virtual Machine Assemblies
  - Import an assembly
  - Create a template from an assembly
  - Edit an assembly
  - Delete an assembly
  - Refresh an assembly

  All documentation for these actions can be found in the section entitled Assemblies.
- Manage Virtual Machine ISO Image Files
  - Import an ISO
  - Edit an ISO
  - Delete an ISO
  - Clone an ISO

  All documentation for these actions can be found in the section entitled ISO Files (CD/DVD Images).
- Manage Virtual Disks
  - Create a virtual disk
  - Import a virtual disk
  - Edit a virtual disk
  - Delete a virtual disk
  - Clone a virtual disk

All documentation for these actions can be found in the section entitled Virtual Disks.

- View Virtual Machine Configuration Entries

  For more information, refer to the section entitled Virtual Machine Configuration Files.

While it is possible to create additional repositories using alternate storage, this is beyond the scope of a normal Oracle Virtual Compute Appliance configuration and is not recommended.

3.6 Configuring Network Resources for Virtual Machines

The **Networking** tab is used to manage networks within the Oracle VM environment running on the Oracle Virtual Compute Appliance. By default, the following networks are already defined and must not be altered:

- `192.168.140.0` : the management network

  This is a private network used exclusively for Oracle VM management traffic. Both management nodes and all compute nodes are connected to this network through their `bond0` interface.

- `192.168.40.0` : the storage network

  This is a private IPoIB network used exclusively for traffic to and from the ZFS storage appliance. Both management nodes and both storage controllers are connected to this network through their `bond1` interface.

Additionally, three networks are listed with the **VM Network** role:

- `vm_public_vlan`

  This default network is the standard choice for virtual machines requiring external network connectivity. It uses VLAN 1 from the VLAN Group named `vm_public_vlan_vgrp`. To use the VLANs of your choice configure them as follows:

  1. Add the tags or IDs to the VLAN Group `vm_public_vlan_vgrp`.

     The process for editing VLAN Groups is described in the Oracle VM User's Guide in the section entitled Editing a VLAN Group.

  2. Create a new VLAN-only network with the *VM role* for each VLAN tag you added to the VLAN Group. Each new network should be configured like the `vm_public_vlan` network, but with a different VLAN segment.

     The process for creating VLAN-only networks is described in the Oracle VM User's Guide in the section entitled Creating a Network.

  3. Configure your data center network accordingly.

     For details, see Section 6.3, “Configuring Data Center Switches for VLAN Traffic”.

- `vm_private`

  This default network is intended for virtual machines requiring network connectivity to other virtual machines hosted on the appliance, but *not* external to the appliance. It uses VLAN 1 from the VLAN Group named `vm_private_vgrp`. To use the VLANs of your choice configure them as follows:

  1. Add the tags or IDs to the VLAN Group `vm_private_vgrp`.

The process for editing VLAN Groups is described in the Oracle VM User's Guide in the section entitled Editing a VLAN Group.

2. Create a new VLAN-only network with the *VM role* for each VLAN tag you added to the VLAN Group. Each new network should be configured like the `vm_private` network, but with a different VLAN segment.

   The process for creating VLAN-only networks is described in the Oracle VM User's Guide in the section entitled Creating a Network.

- `mgmt_public_eth`

  This network is automatically created during the initial configuration of the appliance. It uses the public network that you configured in the Oracle Virtual Compute Appliance Dashboard. The primary function of this network is to provide access to the management nodes from the data center network, and enable the management nodes to run a number of system services. Since all compute nodes are also connected to this network, it may also be used to provide external network access to virtual machines when no VLANs are required. The subnet associated with this network is the same as your data center network.

For more information about Oracle Virtual Compute Appliance network configuration, see Section 1.2.4, “Network Infrastructure”.

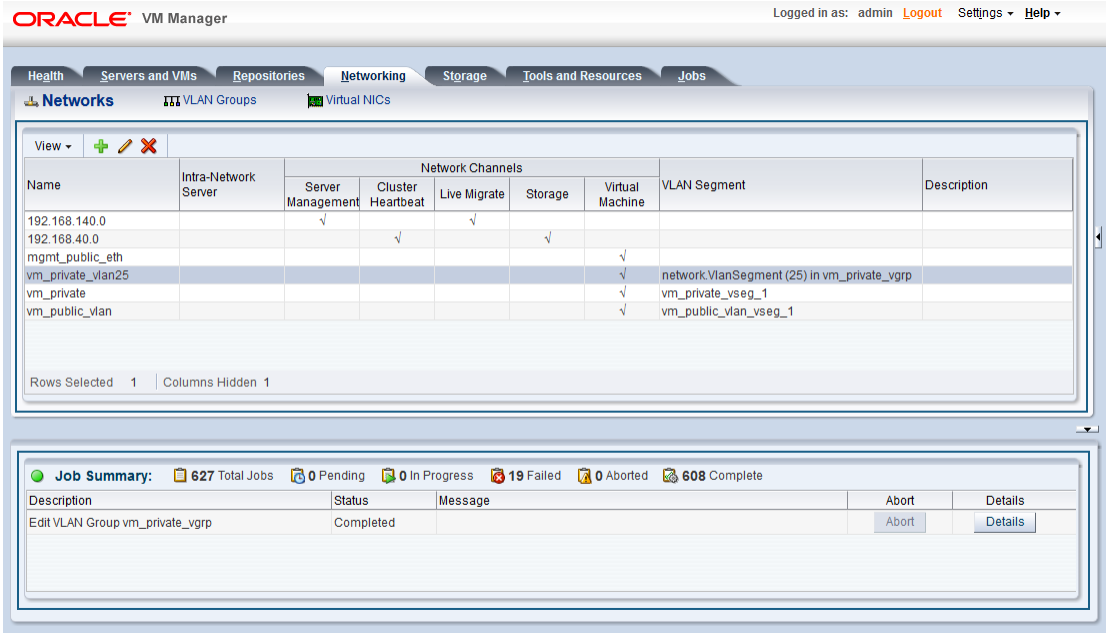
Caution

Do not create a new network in Oracle VM using the `eth0` network ports of the servers in the server pool. Those ports are assigned an IP address by the DHCP server on the internal appliance management network (`192.168.4.0`). If virtual machines are connected to this network, they are likely to cause IP conflicts and security issues.

Do not edit or delete any of the networks listed here. Doing so may cause your appliance to malfunction. In an Oracle Virtual Compute Appliance context, use the Networking tab to configure and manage Virtual NICs and VLANs for use by your virtual machines.

The creation and management of Virtual NICs is important for the facilitation of networking within your virtual machines. Use the **Virtual NICs** subtab to create batches of Virtual NICs that virtual machines are able to use. The process for creating Virtual NICs is described in the Oracle VM User's Guide in the section entitled Managing VNICs.

Figure 3.2 A view of the Networking tab



3.7 Viewing and Managing Storage Resources

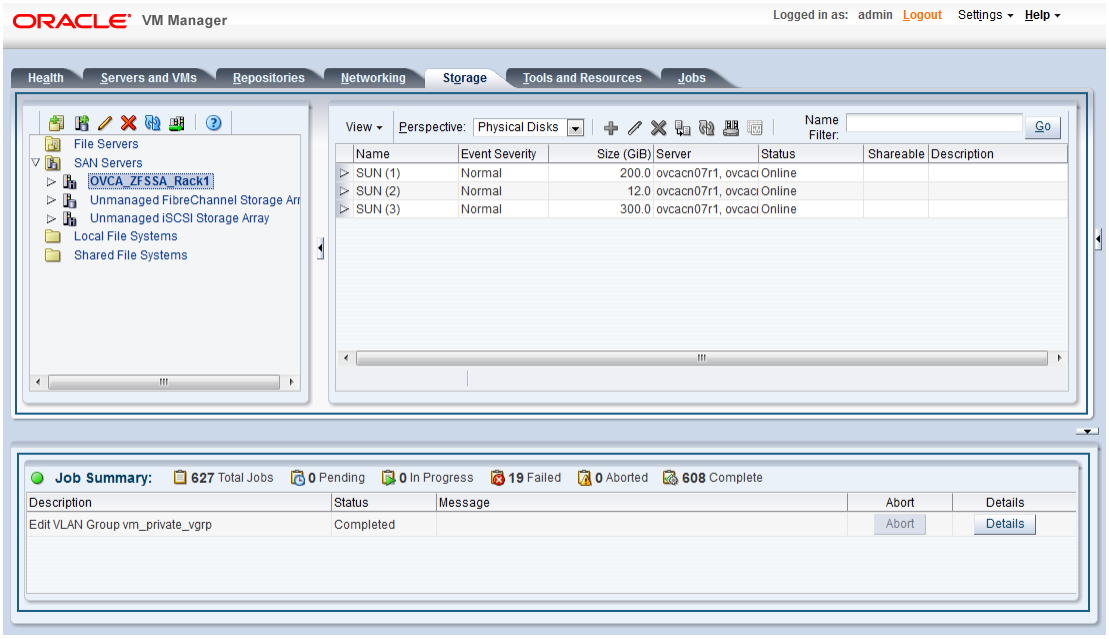
The storage resources underlying the Oracle Virtual Compute Appliance repository and the server pool clustering file system are listed under the **Storage** tab within Oracle VM Manager. The ZFS storage is exported through NFS and is listed under the File Servers folder. Do not modify or attempt to delete this storage.

It is possible to attach additional storage for use within Oracle VM, if you intend to create an additional repository to store virtual machine resources. This activity is beyond the scope of a normal Oracle Virtual Compute Appliance configuration and is not recommended. Information on adding File Servers to your Oracle VM environment is provided in the Oracle VM User's Guide in the section entitled Discovering File Servers.

Note that only NFS storage is supported within Oracle Virtual Compute Appliance Release 1.1.

You are fully capable of using other networked storage, available on the public network, within your own Virtual Machines. The limitations described here apply only to storage used by the Oracle VM environment running within your Oracle Virtual Compute Appliance.

Figure 3.3 A view of the Storage tab



3.8 Tagging of Resources in Oracle VM Manager

The **Tools and Resources** tab is used to configure global settings for Oracle VM and to manage tags, which can be used to identify and group resources. Since many of the global settings such as server update management and NTP configuration are managed automatically within Oracle Virtual Compute Appliance, you do not need to edit any settings here. Those configuration changes could cause the appliance to malfunction.

You are able to create, edit and delete tags, by following the instructions in the section entitled Tags.

3.9 Managing Jobs and Events

The **Jobs** tab provides a view of the job history within Oracle VM Manager. It is used to track and audit jobs and to help troubleshoot issues within the Oracle VM environment. Jobs and events are described in detail within the Oracle VM User's Guide in the section entitled Working with the Jobs Framework.

Since the Recurring Jobs, described in the Oracle VM User's Guide, are all automated and handled directly by the Oracle Virtual Compute Appliance, you must not edit any of the settings for recurring jobs.

Chapter 4 Automating Oracle Virtual Compute Appliance Service Requests

Table of Contents

Oracle Virtual Compute Appliance is qualified for Oracle Auto Service Request (ASR). ASR is a software feature for support purposes. It is integrated with My Oracle Support and helps resolve problems faster by automatically opening service requests when specific hardware failures occur. Using ASR is optional: the components are available in the Release 1.1 software image but they must be installed and configured in order to enable ASR for your appliance.

For the latest information about installing Oracle Auto Service Request (ASR) on Oracle Virtual Compute Appliance, refer to the support note with Doc ID 1645856.1.

Caution

Oracle Auto Service Request (ASR) must be installed by an **authorized Oracle Field Engineer**. Request installation of ASR at the time of system install. Installation at a later date will be a Time and Materials charge.

Oracle is continuously analyzing and improving the ASR fault rules to enhance the Oracle support experience. This includes adding, modifying and removing rules to focus on actionable events from ASR assets while filtering non-actionable events. For up-to-date fault coverage details, please refer to the Oracle Auto Service Request documentation page: http://www.oracle.com/technetwork/systems/asr/documentation/index.html.

4.1 Understanding Oracle Auto Service Request (ASR)

ASR is designed to automatically open service requests when specific Oracle Virtual Compute Appliance hardware faults occur. To enable this feature, the Oracle Virtual Compute Appliance components must be configured to send hardware fault telemetry to the ASR Manager software. ASR Manager must be installed on the master management node, which needs an active outbound Internet connection using HTTPS or an HTTPS proxy.

When a hardware problem is detected, ASR Manager submits a service request to Oracle Support Services. In many cases, Oracle Support Services can begin work on resolving the issue before the administrator is even aware the problem exists.

ASR detects faults in the most common hardware components, such as disks, fans, and power supplies, and automatically opens a service request when a fault occurs. ASR does not detect all possible hardware faults, and it is not a replacement for other monitoring mechanisms, such as SMTP and SNMP alerts, within the customer data center. It is a complementary mechanism that expedites and simplifies the delivery of replacement hardware. ASR should not be used for downtime events in high-priority systems. For high-priority events, contact Oracle Support Services directly.

An email message is sent to both the My Oracle Support email account and the technical contact for Oracle Virtual Compute Appliance to notify them of the creation of the service request. A service request may not be filed automatically on some occasions. This can happen because of the unreliable nature of the SNMP protocol or a loss of connectivity to ASR Manager. Oracle recommends that customers continue to monitor their systems for faults and call Oracle Support Services if they do not receive notice that a service request has been filed automatically.

For more information about ASR, consult the following resources:

- Oracle Auto Service Request web page: http://www.oracle.com/technetwork/systems/asr/overview/index.html.
- Oracle Auto Service Request user documentation: http://docs.oracle.com/cd/E37710_01/index.htm.

4.2 ASR Prerequisites

Before you install ASR, make sure that the prerequisites in this section are met.

Verifying ASR Prerequisites

1. Make sure that you have a valid My Oracle Support account.

   If necessary, create an account at https://support.oracle.com.

2. Ensure that the following are set up correctly in My Oracle Support:

   - technical contact person at the customer site who is responsible for Oracle Virtual Compute Appliance
   - valid shipping address at the customer site where the Oracle Virtual Compute Appliance is located, so that parts are delivered to the site where they must be installed

3. Make sure that Oracle Java - JDK 7 (1.7.0_13 or later) is installed on both management nodes in your Oracle Virtual Compute Appliance. Check the version installed on the system by entering the following command at the Oracle Linux prompt: `java -version`.

   Note

   OpenJDK is not supported by ASR.

   If the installed version does not comply with the ASR prerequisites, download and install the version of JDK included in the Oracle Virtual Compute Appliance Release 1.1 software image. Unpack the Oracle Java - JDK 7 archive in `/opt/`. Repeat this on the other management node.

   ```
   # cd /opt/
   # tar zxvf /nfs/shared_storage/mgmt_image/Server/jdk-7u51-linux-x64.tar.gz
   [...]
   ```

   Note

   Alternatively, you can download the latest version from the Java SE Downloads page: http://www.oracle.com/technetwork/java/javase/downloads/.

   Caution

   Each ASR version is configured to use a particular version of Java. Verify the Java prerequisites whenever you install a new version of ASR. Do not set the

newly installed JDK as the system default Java, because that may cause other components to malfunction.

4. Verify connectivity to the Internet using HTTPS.

   For example, try `curl` to test whether you can access https://support.oracle.com.

4.3 Installing ASR Manager

The necessary packages for ASR Manager are included in the Oracle Virtual Compute Appliance Release 1.1 software image. For ASR Manager to work on Oracle Virtual Compute Appliance, it must be installed on both management nodes, and failover must be configured so that the ASR Manager role is always fulfilled by the management node that also has the master role.

Installing ASR Components on the Management Nodes

1. Using SSH and an account with superuser privileges, log into the master management node.

   Note

   The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

2. Go to the `Packages` directory of the mounted management software image. Verify that the ASR packages are present.

```
# cd /nfs/shared_storage/mgmt_image/Packages/
# ls -al | grep SUNW
-rw-r--r--  1 root root 12406356 Apr  7 04:37 SUNWsasm-1.5.0-112.rpm
-rw-r--r--  1 root root 24090626 Apr  7 04:37 SUNWswasr-4.7-20140116133106.rpm
```

   Note

   You may also download the latest ASR packages from the Oracle Auto Service Request downloads page: http://www.oracle.com/technetwork/systems/asr/downloads/index.html.

3. Install the ASR Manager packages without verifying dependencies.

```
# rpm -ivh SUNWsasm-1.5.0-112.rpm --nodeps
Copyright 2008,2013 Oracle and/or its affiliates. All rights reserved.

License and Terms of Use for this software are described at
https://support.oracle.com/  (see Terms of Use)

# rpm -ivh SUNWswasr-4.7-20140116133106.rpm --nodeps
Copyright [2008,2012], Oracle and/or its affiliates. All rights reserved.

License and Terms of Use for this software are described at
https://support.oracle.com/ (see Legal Notices and Terms of Use).

Directory /var/opt/SUNWsasm/configuration/caseinfo created.
Directory /var/opt/SUNWsasm/configuration/supportfile created.

ASR Manager Auto Update functionality has been enabled by default.
Please ensure that ASR Manager is registered with ASR backend to get the
software updates.
```

```
Warning: rpm-build  package is not installed on this server. ASR Manager
Auto Update functionality will not work unless the rpm-build package is
installed. Auto Update functionality will be disabled until rpm-build
package is installed. Please install the rpm-build package and then enable
Auto Update by running "asrenable_autoupdate".
Installation of SUNWswasr was successful.
```

Warning

For Oracle Virtual Compute Appliance the auto-update feature of ASR must not be used.

At the end of the installation, the ASR Manager service (`sasm`) is started automatically.

4. Stop the ASR Manager service and prevent it from starting automatically.

```
# service sasm status
Oracle Automated Service Manager (pid 450596) is running...
# service sasm stop
Stopping Oracle Automated Service Manager...
Stopped.
# chkconfig sasm off
```

5. Configure the init service to log when the ASR Manager service starts and stops.

   a. Open the file `/etc/init.d/sasm` for editing.

   b. In the start and stop sections, add the echo commands as shown.

```
'start')
  /opt/SUNWsasm/bin/sasm start-instance
  echo "START: `hostname`  `date "+%D %T"`" >> /nfs/shared_storage/ASRM/ASRHA.log
    ;;

'stop')
  /opt/SUNWsasm/bin/sasm stop-instance
  echo "STOP:  `hostname`  `date "+%D %T"`" >> /nfs/shared_storage/ASRM/ASRHA.log
    ;;
```

   c. Save and close the file `/etc/init.d/sasm`.

6. Make sure that the `sasm` configuration file points to the correct JDK.

   a. Verify and copy the path to the appropriate java executable. If you installed Oracle Java - JDK 7 by following the instructions in the Prerequisites section, it should be `/opt/jdk1.7.0_51/bin/java`.

   b. Open the `sasm` configuration file `/var/opt/SUNWsasm/configuration/config.ini` for editing.

   c. Set the `java.exec` value to the path you copied.

```
# OASM version
#
sasm.version=1.5.0
#
# The JVM lookup-order of OASM has been defined as follows:
# 1. JAVA_HOME/bin
# 2. java.exec value defined below
# 3. java in path
#
# Therefore, note that JAVA_HOME/bin/java takes precedence (if exists) over th
# so remember to unset JAVA_HOME if you prefer to use following java.exec spe
```

```
#
# java.exec=/usr/java/default/bin/java
java.exec=/opt/jdk1.7.0_51/bin/java
#
[...]
```

d. Save and close the file `/var/opt/SUNWsasm/configuration/config.ini`.

7. Preserve the data in the original ASR directories.

```
# mv /var/opt/SUNWsasm /var/opt/orig_SUNWsasm
```

8. Repeat this procedure on the other management node.

Caution

The secondary management node does not need to take over the master role during the ASR installation.

The ASR Manager service must remain stopped on both management nodes.

Configuring ASR Manager Failover

1. Using SSH and an account with superuser privileges, log into the master management node.

Note

The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

2. Create the following directories and log file on the shared storage:

```
# mkdir /nfs/shared_storage/ASRM
# mkdir /nfs/shared_storage/ASRM/VarOptSUNWsasm
# touch /nfs/shared_storage/ASRM/ASRHA.log
```

3. Copy the original ASR data from the master management node local file system to the shared storage.

```
# cp -r /var/opt/orig_SUNWsasm/* /nfs/shared_storage/ASRM/VarOptSUNWsasm
```

4. Create a symlink to the directory on the shared storage.

```
# ln -s /nfs/shared_storage/ASRM/VarOptSUNWsasm /var/opt/SUNWsasm
```

5. Add the `sasm` service to the Oracle Virtual Compute Appliance system configuration.

a. Open the file `/var/lib/ovca/ovca-system.conf` for editing.

b. Insert a new line to add `sasm` to the foundational services.

```
[mgmt_init]
[...]
foundational_services: ovmm_mysql
                       ovmm
                       tinyproxy
                       xms
                       dhcpd
                       sasm
```

```
[...]
```

c. Save and close the file `/var/lib/ovca/ovca-system.conf`.

6. Log into the other management node and execute steps 4 and 5.

   a. Create a symlink to the directory on the shared storage.

   b. Add the `sasm` service to the Oracle Virtual Compute Appliance system configuration.

Starting ASR Manager

1. Using SSH and an account with superuser privileges, log into the master management node.

Note

The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

2. Start the ASR Manager service.

Note

You can monitor the process by tailing the log file `/nfs/shared_storage/ASRM/ASRHA.log`.

```
# service sasm start
```

3. Set the ASR Manager log level to *fine*.

```
# /opt/SUNWswasr/bin/asr

asr> get_loglevel
INFO

asr> set_loglevel fine
log.level is set to FINE
Stopping ASR
ASR stopped
Starting ASR
ASR started

asr> get_loglevel
FINE
```

4. Register the ASR Manager.

   ASR Manager (ASRM) can be registered as a stand-alone ASRM or as a relay to another ASRM in your network. Even if other systems at your site already use an ASRM, you can choose to register the Oracle Virtual Compute Appliance ASRM as stand-alone. This means it communicates directly with the Oracle backend systems, which is the standard registration method.

   For details and instructions, refer to the section entitled "Register the ASR Manager" in the Oracle Auto Service Request Installation and Operations Guide.

   Due to networking restrictions, the Oracle Virtual Compute Appliance ASRM can only be routed through an existing one. ASRM relay is not possible in the opposite direction. To register the ASRM as a relay,

you must enable the HTTP receiver on the existing ASRM, and register the Oracle Virtual Compute Appliance ASRM to the HTTP receiver web address.

For details and instructions, refer to the section entitled "Enable HTTP Receiver for ASR Manager Relay, Solaris 11, and VOP" in the Oracle Auto Service Request Installation and Operations Guide.

5. Test ASR Manager failover by rebooting the current master management node.

Note

You can monitor the process by tailing the log file `/nfs/shared_storage/ASRM/ASRHA.log`.

4.4 Activating ASR Assets

The Oracle Virtual Compute Appliance components that are qualified as ASR assets, are:

- Sun Server compute nodes
- NM2-36P Sun Datacenter InfiniBand Expansion Switches
- ZFS Storage Appliance

Note

There is no ASR support for the Oracle Switch ES1-24 switches and Oracle Fabric Interconnect F1-15 Director Switches in Oracle Virtual Compute Appliance Release 1.1. The two management nodes also must not be activated.

This section provides the instructions to activate each type of Oracle Virtual Compute Appliance ASR asset.

4.4.1 Activating Compute Nodes

The ASR activation mechanism requires operations in two separate locations. First the compute node ILOMs are configured to send SNMP traps to the ASR Manager when a failure occurs. Then the ASR Manager is configured to recognize the ILOMs as assets and accept their input. Follow the procedure below to activate the compute nodes as ASR assets.

Activating Compute Nodes as ASR Assets

1. Using SSH, log into the compute node ILOM as `root`.
2. Go to the alert rules directory and display rule set 1.

```
-> cd /SP/alertmgmt/rules
/SP/alertmgmt/rules

-> show 1
  /SP/alertmgmt/rules/1
      Targets:
      Properties:
          type = snmptrap
          level = disable
          destination = 0.0.0.0
          destination_port = 0
          community_or_username = public
          snmp_version = 1
          testrule = (Cannot show property)
```

```
->
```

If the rule set is available (destination = 0.0.0.0), configure it for ASR. Otherwise, look for the next available rule set.

3. Define a new rule set with the following properties:

```
-> cd 1
-> set level=minor destination=192.168.4.216 destination_port=162 snmp_version=2c
-> show
  /SP/alertmgmt/rules/1
      Targets:
      Properties:
          type = snmptrap
          level = minor
          destination = 192.168.4.216
          destination_port = 162
          community_or_username = public
          snmp_version = 2c
          testrule = (Cannot show property)
      Commands:
          cd
          set
          show
->
```

The *destination* property is a virtual IP in the appliance management network, shared by both management nodes, but active only on the master.

Rule set properties are space-separated.

4. Activate the compute node as an ASR asset in ASR Manager.

   a. Using SSH, log into the master management node.

   b. Activate the asset by adding its ILOM IP to the ASR configuration with the following command:

```
# /opt/SUNWswasr/bin/asr activate_asset –i <asset_ilom_ip>
```

Caution

Verify that you are activating the asset with the IP address of its ILOM, and not the IP assigned to another network interface.

5. Repeat this procedure for each compute node you wish to activate as an ASR asset.

4.4.2 Activating InfiniBand Switches

The ASR activation mechanism requires operations in two separate locations. First the switches' ILOMs are configured to send SNMP traps to the ASR Manager when a failure occurs. Then the ASR Manager is configured to recognize the ILOMs as assets and accept their input. Follow the procedure below to activate the NM2-36P Sun Datacenter InfiniBand Expansion Switches as ASR assets.

Activating InfiniBand Switches as ASR Assets

1. Using SSH, log into the NM2-36P Sun Datacenter InfiniBand Expansion Switch ILOM as `root`.

2. Launch the Service Processor shell.

```
[root@ilom-ovcasw19r1 ~]# spsh
->
```

3. Go to the alert rules directory and display rule set 1.

```
-> cd /SP/alertmgmt/rules
/SP/alertmgmt/rules

-> show 1
  /SP/alertmgmt/rules/1
      Targets:
      Properties:
          type = snmptrap
          level = disable
          destination = 0.0.0.0
          destination_port = 0
          community_or_username = public
          snmp_version = 1
          testrule = (Cannot show property)
      Commands:
          cd
          set
          show
->
```

4. Define a new rule set with the following properties:

```
-> cd 1
-> set level=minor destination=192.168.4.216 destination_port=162 snmp_version=2c
Set 'level' to 'minor'
Set 'destination' to '192.168.4.216'
Set 'destination_port' to '162'
Set 'snmp_version' to '2c'

-> show
  /SP/alertmgmt/rules/1
      Targets:
      Properties:
          type = snmptrap
          level = minor
          destination = 192.168.4.216
          destination_port = 162
          community_or_username = public
          snmp_version = 2c
          testrule = (Cannot show property)
      Commands:
          cd
          set
          show
->
```

   The *destination* property is a virtual IP in the appliance management network, shared by both management nodes, but active only on the master.

   Rule set properties are space-separated.

5. Make sure that SNMP version 2c is enabled on the switch.

```
-> cd /SP/services/snmp
/SP/services/snmp
-> show
  /SP/services/snmp
      Targets:
          communities
          mibs
          users
      Properties:
          engineid = (none)
          port = 161
```

```
          servicestate = enabled
          sets = disabled
          v1 = disabled
          v2c = disabled
          v3 = enabled
      Commands:
          cd
          set
          show
-> set v2c=enabled
```

6. Activate the NM2-36P Sun Datacenter InfiniBand Expansion Switch as an ASR asset in ASR Manager.

   a. Using SSH, log into the master management node.

   b. Activate the asset by adding its ILOM IP to the ASR configuration with the following command:

   ```
   # /opt/SUNWswasr/bin/asr activate_asset –i <asset_ilom_ip>
   ```

7. Repeat this procedure for the second InfiniBand switch in order to activate it as an ASR asset.

4.4.3 Activating ASR on the ZFS Storage Appliance

The ZFS Storage Appliance differs from the other ASR assets because it runs its own ASR Manager, and relays its ASR data to the Oracle backend systems through the outbound connection of the master management node. To achieve this, Oracle Virtual Compute Appliance relies on the `tinyproxy` HTTP and HTTPS proxy daemon. ASR requires `tinyproxy` version 1.8.3 or later to be installed and properly configured on both management nodes.

Configuring tinyproxy for ASR

1. Using SSH and an account with superuser privileges, log into the master management node.

   Note

   The data center IP address used in this procedure is an example.

   ```
   # ssh root@10.100.1.101
   root@10.100.1.101's password:
   [root@ovcamn05r1 ~]#
   ```

2. Stop the `tinyproxy` service and verify the version installed on the system.

   ```
   # service tinyproxy stop
   Stopping tinyproxy: [ OK ]
   # rpm -q tinyproxy
   tinyproxy-1.8.2-1.el6.x86_64
   ```

3. If the installed tinyproxy is older than version 1.8.3, upgrade it to the version referenced in the support note with Doc ID 1645856.1.

   Download the tinyproxy rpm to a temporary directory on the management node and run the upgrade command.

   ```
   # cd /tmp
   # ls -al tinyproxy*
   -rw-r--r-- 1 root root 61224 Apr 4 13:44 tinyproxy-1.8.3-1.el6.x86_64.rpm
   # rpm -Uvh tinyproxy-1.8.3-1.el6.x86_64.rpm
   warning: tinyproxy-1.8.3-1.el6.x86_64.rpm: Header V3 RSA/SHA256 Signature,
   key ID ec551f03: NOKEY
   Preparing...                ########################################### [100%]
   ```

```
   1:tinyproxy              ########################################### [100%]
```

4. Make the necessary changes to the tinyproxy configuration to enable ASR traffic through the management node.

   a. Open the file `/etc/tinyproxy/tinyproxy.conf` for editing.

   b. Look for the section that defines on which interfaces tinyproxy listens. It starts with "`# Listen:`".

      Comment out the line that binds tinyproxy to the interface in the Oracle VM management network by adding a "#" character in front of it.

```
# Listen: If you have multiple interfaces this allows you to bind to
# only one. If this is commented out, tinyproxy will bind to all
# interfaces present.
#
#Listen 192.168.140.4
```

   c. Scroll down to the section Customization of authorization controls. It starts with "`# Allow:`".

      Add two lines to allow traffic from the internal appliance management network and Oracle VM management network.

```
# Allow: Customization of authorization controls. If there are any
# access control keywords then the default action is to DENY. Otherwise,
# the default action is ALLOW.
#
# The order of the controls are important. All incoming connections are
# tested against the controls based on order.
#
#Allow 127.0.0.1
Allow 192.168.4.0/24
Allow 192.168.140.0/24
```

   d. Save and close the file `/etc/tinyproxy/tinyproxy.conf`.

5. Restart the `tinyproxy` service and verify the installed version.

```
# service tinyproxy start
Starting tinyproxy: [ OK ]
# tinyproxy -version
tinyproxy 1.8.3
```

6. Repeat this procedure on the other management node.

Activating the ZFS Storage Appliance

For detailed information about enabling ASR on the ZFS Storage Appliance, refer to the support note with Doc ID 1285455.1.

You must set up the ZFS Storage Appliance to relay its ASR data through the ASR Manager on the master management node, using the following proxy settings:

- **inet addr:** 192.168.4.216
- **broadcast:** 192.168.4.255
- **mask:** 255.255.255.0
- **port:** 8888

Chapter 5 Servicing Oracle Virtual Compute Appliance Components

Table of Contents

This chapter contains an overview of replaceable components in your Oracle Virtual Compute Appliance, and provides servicing instructions for customer-replaceable units.

5.1 Replaceable Components

According to Oracle's Component Replacement Policy, the replaceable components in your system are designated as either field-replaceable units (FRUs) or customer-replaceable units (CRUs).

- A part designated as a FRU must be replaced by an Oracle-qualified service technician.
- A part designated as a CRU can be replaced by a person who is not an Oracle-qualified service technician.

All CRUs and FRUs are listed and identified in this chapter, but the servicing instructions included in this Oracle Virtual Compute Appliance Administrator's Guide are focused primarily on CRUs. For FRU replacement, please contact Oracle.

5.1.1 Rack Components

The following table lists the replaceable components of the Oracle Virtual Compute Appliance rack.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.1 Replaceable Oracle Virtual Compute Appliance Rack Components

Component Description	FRU/CRU	Hot-Swap
Sun Rack II 1242:		
Jumper Cable C13-C14, 2m	FRU	Yes
Jumper Cable C19-C20, 1m	FRU	Yes
10Gbps QSFP to QSFP Cable, 3m	FRU	Yes
Ethernet Cable, Category 5/5E, RJ45 to RJ45, 10ft, Blue	FRU	Yes
Ethernet Cable, Category 5/5E, RJ45 to RJ45, 1m, Grey	FRU	Yes
Ethernet Cable, Category 5/5E, RJ45 to RJ45, 7ft, Black	FRU	Yes
Ethernet Cable, Category 5/5E, RJ45 to RJ45, 7ft, Green	FRU	Yes
Ethernet Cable, Category 5/5E, RJ45 to RJ45, 7ft, Yellow	FRU	Yes
Ethernet Cable, Category 6A, RJ45 to RJ45, 10ft, Black	FRU	Yes
Ethernet Cable, Category 6A, RJ45 to RJ45, 10ft, Blue	FRU	Yes
1U/2U Screw-Mount Slide Rail Kit	FRU	
1U/2U Cable Management Arm (Snap-in)	FRU	
10Gbps SFP+ TwinX Cable, 1m	FRU	Yes
1.25Gb/Sec Copper SFP Transceiver	FRU	
10Gbps QSFP to QSFP Cable, 1m	FRU	Yes
Power Distribution Units (PDUs):		
22KVA Single-Phase PDU, North America	FRU	Yes
22KVA Single-Phase PDU, International	FRU	Yes
24KVA Three-Phase PDU, North America	FRU	Yes

Component Description	FRU/CRU	Hot-Swap
24KVA Three-Phase PDU, International	FRU	Yes

For rack-level component servicing instructions, see Section 5.3, “Servicing the Oracle Virtual Compute Appliance Rack System”.

5.1.2 Sun Server X4-2 Components

The following table lists the replaceable components of the Sun Server X4-2 management and compute nodes.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.2 Replaceable Sun Server X4-2 Components

Component Description	FRU/CRU	Hot-Swap
System Board Assembly	FRU	No
Dual Counter Rotating Fan Module	CRU	Yes
1-Slot PCI Express Riser Assembly	FRU	No
2-Slot PCI Express Riser Assembly	FRU	No
A256 600 Watt AC Input Power Supply	CRU	Yes
2.6GHz Intel 8-core Xeon E5-2650, 95W	FRU	No
Pre-Greased CPU Heatsink	FRU	No
2.5" Disk Cage Front Indicator Module	FRU	No
4-Slot 2.5" Disk Backplane Assembly	FRU	No
1.2TB - 10000 RPM SAS Disk Assembly with 1 bracket	CRU	Yes
16GB DDR3-1600 DIMM, 1.35V	FRU	No
Dual port 80Gbps InfiniBand QDR PCI Express 3.0 Host Channel Adapter M3 (CX-3)	FRU	No
4GB USB 2.0 Flash Drive	FRU	No
8-Port 6Gbps SAS-2 RAID PCI Express HBA, B4 ASIC	FRU	No
1U/2U Remote Battery Assembly	CRU	No
Cable Kit	FRU	No

For Sun Server X4-2 component servicing instructions, see Section 5.4, “Servicing a Sun Server X4-2”.

5.1.3 Sun Server X3-2 Components

The following table lists the replaceable components of the Sun Server X3-2 management and compute nodes.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.3 Replaceable Sun Server X3-2 Components

Component Description	FRU/CRU	Hot-Swap
System Board Assembly	FRU	No
Dual Counter Rotating Fan Module	CRU	Yes
1-Slot PCI Express Riser Assembly	FRU	No
2-Slot PCI Express Riser Assembly	FRU	No
A256 600 Watt AC Input Power Supply	CRU	Yes
2.2GHz Intel 8-core Xeon E5-2660, 95W	FRU	No
Pre-Greased CPU Heatsink	FRU	No
2.5" Disk Cage Front Indicator Module	FRU	No
4-Slot 2.5" Disk Backplane Assembly	FRU	No
900GB - 10000 RPM SAS Disk Assembly with 1 bracket	CRU	Yes
16GB DDR3-1600 DIMM, 1.35V	FRU	No
Dual 40Gbps InfiniBand 4x QDR PCI Express Low Profile Host Channel Adapter	FRU	No
4GB USB 2.0 Flash Drive	FRU	No
8-Port 6Gbps SAS-2 RAID PCI Express HBA, B4 ASIC	FRU	No
1U/2U Remote Battery Assembly	CRU	No

For Sun Server X3-2 component servicing instructions, see Section 5.5, “Servicing a Sun Server X3-2”.

5.1.4 Oracle ZFS Storage Appliance ZS3-ES Components

The following table lists the replaceable components of the Oracle ZFS Storage Appliance ZS3-ES.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.4 Replaceable Oracle ZFS Storage Appliance ZS3-ES Components

Component Description	FRU/CRU	Hot-Swap
Oracle ZFS Storage Appliance ZS3-ES Storage Head:		
2.1GHz Intel 8-Core Xeon E5-2658, 95W	FRU	No
Pre-greased CPU Heatsink	FRU	No
16GB DDR-1600 DIMM, 1.35V	FRU	No
1.6TB SAS Solid State Drive Assembly	CRU	Yes
900GB - 10000 RPM SAS Disk Assembly	CRU	Yes
Dual 40Gbps InfiniBand 4x QDR PCI Express Low Profile Host Channel Adapter	FRU	No
4GB USB 2.0 Flash Drive	FRU	No
2-Slot PCI Express Riser Assembly	FRU	No
1-Slot PCI Express Riser Assembly	FRU	No
Power Distribution Board	FRU	No
2.5" Disk Cage Front Indicator Module	FRU	No
4-Slot 2.5" Disk Backplane Assembly	FRU	No
Cable Kit	FRU	No
Dual Counter Rotating Fan Module	CRU	Yes
System Board Assembly	FRU	No
1U/2U Remote Battery Assembly	CRU	No
Type A256 600 Watt AC Input Power Supply	CRU	Yes
Cluster Heartbeat Assembly	FRU	No
8-Port 6Gbps SAS-2 RAID HBA	FRU	No
8-Port 6Gbps SAS-2 PCI Express HBA (LSI)	FRU	No
Oracle Storage DE2-24P Disk Shelf:		
580 Watt AC Input Power Supply	FRU	Yes
6Gbps SAS-2 I/O Controller Module	FRU	Yes
2RU Chassis Assembly with Midplane	FRU	No
4X Mini SAS Cable, SFF-8088 to SFF-8088, 2M	FRU	
4X Mini SAS Cable, SFF-8088 to SFF-8088, 0.5M	FRU	
DE2-24P Mounting Rail Kit	FRU	
900GB 10000 RPM SAS Disk Drive Assembly	CRU	Yes
73GB SAS Solid State Drive Assembly	CRU	Yes

For Oracle ZFS Storage Appliance ZS3-ES component servicing instructions, see Section 5.6, “Servicing the Oracle ZFS Storage Appliance ZS3-ES”.

5.1.5 Sun ZFS Storage Appliance 7320 Components

The following table lists the replaceable components of the Sun ZFS Storage Appliance 7320.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.5 Replaceable Sun ZFS Storage Appliance 7320 Components

Component Description	FRU/CRU	Hot-Swap
Sun ZFS 7320 Storage Head:		
2.4GHz Intel Quad-Core Xeon E5620, 12MB, 80W	FRU	No
Xeon Heatsink	FRU	No
8GB Registered DDR3L-1333/DDR3L-1600 DIMM, 1.35V	CRU	No
512GB Solid State Drive SATA-2 Assembly	CRU	Yes
500GB - 10000 RPM SATA Disk Assembly with 1 bracket	CRU	Yes
USB Assembly	CRU	Yes
Dual 40Gbps InfiniBand 4x QDR PCI Express Low Profile Host Channel Adapter	CRU	No
4GB USB 2.0 Flash Drive	CRU	No
1-Slot x8 PCI Express Riser Assembly	CRU	No
1-Slot x16 PCI Express Riser Assembly	CRU	No
Power Distribution Board	FRU	No
8-Slot Disk Backplane, SATA DVD	FRU	No
PDB to System Board Ribbon Cable	CRU	
SFF8087 to SFF8087 Mini-SAS Cable, 690mm	CRU	
6-Pin Fan Power Cable	CRU	
Fan Data Ribbon Cable	CRU	
Bus Bar Set	CRU	
Fan Board Assembly	CRU	
Connector Board Assembly, SATA DVD	FRU	
Fan Module	CRU	Yes
System Board Assembly	FRU	No
3V Lithium Coin Cell Battery	CRU	No
Type A247A 760 Watt AC Input Power Supply	CRU	Yes
Cluster Heartbeat Assembly	CRU	
8-Port 6Gbps SAS-2 RAID HBA	CRU	No
Oracle Storage DE2-24P Disk Shelf:		

Component Description	FRU/CRU	Hot-Swap
580 Watt AC Input Power Supply	CRU	Yes
6Gbps SAS-2 I/O Controller Module	CRU	Yes
2RU Chassis Assembly with Midplane	FRU	No
4X Mini SAS Cable, SFF-8088 to SFF-8088, 2M	CRU	
4X Mini SAS Cable, SFF-8088 to SFF-8088, 0.5M	CRU	
DE2-24P Mounting Rail Kit	CRU	
900GB 10000 RPM SAS Disk Drive Assembly	CRU	Yes
73GB SAS Solid State Drive Assembly	CRU	Yes

For Sun ZFS Storage Appliance 7320 component servicing instructions, see Section 5.7, “Servicing the Sun ZFS Storage Appliance 7320”.

5.1.6 Oracle Switch ES1-24 Components

The following table lists the replaceable components of the Oracle Switch ES1-24.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.6 Replaceable Oracle Switch ES1-24 Components

Component Description	FRU/CRU	Hot-Swap
24-Port ES1-24 Switch Assembly	FRU	No
Rear-to-Front Airflow Fan Module	CRU	Yes
Type A247A 760 Watt AC Input Power Supply	CRU	Yes

For Oracle Switch ES1-24 component servicing instructions, see Section 5.8, “Servicing an Oracle Switch ES1-24”.

5.1.7 NM2-36P Sun Datacenter InfiniBand Expansion Switch Components

The following table lists the replaceable components of the Sun Datacenter InfiniBand Expansion Switch NM2-36P.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.7 Replaceable NM2-36P Sun Datacenter InfiniBand Expansion Switch Components

Component Description	FRU/CRU	Hot-Swap
Datacenter InfiniBand Switch 36 Subassembly	FRU	No
Type A247A 760 Watt AC Input Power Supply	CRU	Yes
Rear-to-Front Airflow Fan Module	CRU	Yes

For NM2-36P Sun Datacenter InfiniBand Expansion Switch component servicing instructions, see Section 5.9, “Servicing an NM2-36P Sun Datacenter InfiniBand Expansion Switch”.

5.1.8 Oracle Fabric Interconnect F1-15 Director Switch Components

The following table lists the replaceable components of the Oracle Fabric Interconnect F1-15 Director Switch.

Note

For the current list of replacement parts and their manufacturing part numbers, please refer to the Oracle Virtual Compute Appliance components list in the Oracle System Handbook.

You access the Oracle System Handbook using this link: https://support.oracle.com/handbook_private/.

Click *Current Systems*, then click *Oracle Virtual Compute Appliance Hardware* to open the main product page in the System Handbook.

Table 5.8 Replaceable Oracle Fabric Interconnect F1-15 Director Switch Components

Component Description	FRU/CRU	Hot-Swap
F1-15 Power Supply	FRU	Yes
QDR Fabric Board	FRU	No
2U/4U Front Panel G2 (Com-X i7)	FRU	No
F1-15 I/O Management Module	FRU	No
F1-15 Fan Tray	FRU	Yes
Quad Port 10 Gigabit Ethernet (GbE) Module	FRU	Yes
Dual Port 2 × 8 Gigabit Fibre Channel I/O Module	FRU	Yes
F1-15 Chassis without Power Supply, Fan, Fabric Board, Front Panel	FRU	No

For Oracle Fabric Interconnect F1-15 Director Switch component servicing instructions, see Section 5.10, “Servicing an Oracle Fabric Interconnect F1-15 Director Switch”.

5.2 Preparing Oracle Virtual Compute Appliance for Service

This section describes safety considerations and prerequisites for component replacement procedures.

Safety Precautions

For your protection, observe the following safety precautions when servicing your equipment:

- Follow all standard cautions, warnings, and instructions marked on the equipment and described in the following documents:
  - The printed document *Important Safety Information for Sun Hardware Systems (7063567)*
  - The *Oracle Virtual Compute Appliance Safety and Compliance Guide (E52088-01)*
- Follow the safety guidelines described in the *Oracle Virtual Compute Appliance Installation Guide (E52086-02)*:
  - Electrical Power Requirements
  - Rack-mount Safety Precautions
- Follow the electrostatic discharge safety practices as described in this section.
- Disconnect all power supply cords before servicing components.

Electrostatic Discharge Safety

Devices that are sensitive to electrostatic discharge (ESD), such as motherboards, PCIe cards, drives, processors, and memory cards require special handling.

Caution

Equipment Damage

Take antistatic measures and do not touch components along their connector edges.

- **Use an antistatic wrist strap.**

  Wear an antistatic wrist strap and use an antistatic mat when handling components such as drive assemblies, boards, or cards. When servicing or removing rack node components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Then disconnect the power cords from the component. Following this practice equalizes the electrical potentials between you and the component.

  An antistatic wrist strap is *not* included in the Oracle Virtual Compute Appliance shipment.

- **Use an antistatic mat.**

  Place ESD-sensitive components such as the motherboard, memory, and other PCB cards on an antistatic mat.

  The following items can be used as an antistatic mat:

  - Antistatic bag used to wrap an Oracle replacement part
  - An ESD mat (orderable from Oracle)
  - A disposable ESD mat (shipped with some replacement parts or optional system components)

5.3 Servicing the Oracle Virtual Compute Appliance Rack System

This section provides instructions to service replaceable components (CRUs/FRUs) in the appliance rack. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.3.1 Powering Down Oracle Virtual Compute Appliance (When Required)

Some service procedures may require you to power down Oracle Virtual Compute Appliance. Perform the following steps to manually power down the system.

Powering down the system

1. Press the Power button on the Sun Server X3-2 compute nodes in order to shut them down gracefully.
2. Press the Power button on the Sun Server X3-2 management nodes in order to shut them down gracefully.

   Once the Sun Server X3-2 machines are powered off, you can proceed to power off the storage appliance.
3. Press the Power button on the storage server heads attached to the chassis of the storage device.
4. Press the Power button on both Oracle Fabric Interconnect F1-15 Director Switches.
5. Toggle the rack Power switches to the Off position.

Note

The Ethernet and InfiniBand switches do not have power switches. They power off when power is removed, by way of the power distribution unit (PDU) or at the breaker in the data center.

Returning the system to operation

1. Toggle the power distribution unit (PDU) circuit breakers of both PDUs to the On position.
2. Wait at least two minutes to allow the PDUs to complete their power-on sequence.

   The Ethernet and InfiniBand switches and storage server heads are powered on with the PDUs.
3. Press the Power button on each Oracle Fabric Interconnect F1-15 Director Switch.

   Wait until the Status LED stops blinking and is solid green, indicating the system has finished booting.
4. Press the Power button on the Sun Server X3-2 management nodes.

   The management node that completes booting first assumes the master role.
5. When the management nodes are up, press the Power button on the Sun Server X3-2 compute nodes.

   When all compute nodes are up, verify the status of all system components in Oracle VM Manager.

   If no components are in error state, the appliance is ready to resume normal operation.

5.3.2 Service Procedures for Rack System Components

For parts that are not hot-swappable, power down the Oracle Virtual Compute Appliance before starting the service procedure. Generally speaking, hot-swappable components can be serviced without specific additional steps.

Table 5.9 Service Instructions for Rack System Components

Replaceable Part(s)	Hot-Swap	Instructions
Power cables		

Replaceable Part(s)	Hot-Swap	Instructions
Ethernet cables		
InfiniBand cables		
SFP transceivers (Oracle-qualified service technician only)		
Cable management arms (CMAs) (Oracle-qualified service technician only)		For removal and installation of a cable management arm, refer to the Sun Server X4-2 Installation Guide (part no. E38019). • "Remove the Second-Generation Cable Management Arm" • "Install the Second-Generation Cable Management Arm"
Slide rails (Oracle-qualified service technician only)		To service the slide rails, the server must be removed from the rack. For instructions, refer to the Sun Server X4-2 Service Manual (part no. E38041). • "Remove the Server From the Rack" • "Reinstall the Server Chassis Into the Rack" For slide rail installation instructions, refer to the section Attach Tool-less Slide-Rail Assemblies in the Sun Server X4-2 Installation Guide (part no. E38019). To remove the slide rails, reverse the installation steps.

5.4 Servicing a Sun Server X4-2

This section provides instructions to service replaceable components (CRUs/FRUs) in a Sun Server X4-2 management node or compute node. Before starting any service procedure, read and follow the guidelines in Section 5.2, "Preparing Oracle Virtual Compute Appliance for Service".

5.4.1 Powering Down Sun Server X4-2 for Service (When Required)

If you need to execute a service procedure that requires the Sun Server X4-2 to be powered down, follow these instructions:

Note

The management nodes are not placed in maintenance node for servicing. If you need to power down the master management node, bring it offline as described below and wait for the other management node to take over the master role. If you need to power down the secondary management node, no additional steps are required.

Placing a compute node into maintenance mode

Before a Sun Server X4-2 compute node can be powered down, it must be placed into maintenance mode from within Oracle VM Manager. As a result, all virtual machines running on the compute node are automatically migrated to other servers in the Oracle VM server pool, if they are available. For details, refer to the section "Placing an Oracle VM Server into Maintenance Mode" in the Oracle VM User's Guide.

1. Log in to the Oracle VM Manager Web UI.

   For details, refer to the section "Section 3.2, "Logging in to the Oracle VM Manager Web UI"" in the Oracle Virtual Compute Appliance Administrator's Guide.

   a. Enter the following address in a Web browser: https://*manager-vip*:7002/ovm/console.

      Replace *manager-vip* with the virtual IP address, or corresponding host name, that you have configured for your management nodes during installation.

   b. Enter the Oracle VM Manager user name and password in the respective fields and click OK.

2. In the **Servers and VMs** tab, select the Oracle VM Server in the navigation pane. Click **Edit Server** in the management pane toolbar.

   The **Edit Server** dialog box is displayed.

3. Select the **Maintenance Mode** check box to place the Oracle VM Server into maintenance mode. Click OK.

   The Oracle VM Server is in maintenance mode and ready for servicing.

4. When the Sun Server X4-2 is ready to rejoin the Oracle VM server pool, perform the same procedure and clear the **Maintenance Mode** check box.

Powering down the system

These steps briefly describe the procedure. For detailed instructions, refer to the chapter "Preparing for Service" in the Sun Server X4-2 Service Manual (part no. E38041).

1. Power down the server gracefully whenever possible.

   The easiest way is to press and quickly release the Power button on the front panel.

2. Perform immediate shutdown only if the system does not respond to graceful power-down tasks.

   Caution

   System data may become corrupted during an immediate power down. Use this task only after attempting to power down the server gracefully.

3. Extend the server to the maintenance position.

4. Disconnect the power cables and data cables from the server.

5. Most service operations can be performed while the server is in the maintenance position.

   However, if necessary, remove the cable management arm (CMA) and pull the server out of the rack.

   Caution

   The server weighs approximately 18.1 kg (39.9 lb). Two people are required to dismount and carry the chassis.

Returning the system to operation

These steps briefly describe the procedure. For detailed instructions, refer to the chapter "Returning the Server to Operation" in the Sun Server X4-2 Service Manual (part no. E38041).

1. If the top cover was removed to service a component, reinstall the top cover on the server.
2. If the server was removed, reinstall it into the rack.
3. Reconnect data cables and power cords.
4. Return the server to its normal operational position in the rack, making sure the CMA is correctly installed.
5. Power on the server.

5.4.2 Service Procedures for Sun Server X4-2 Components

For parts that are not hot-swappable, power down the Sun Server X4-2 before starting the service procedure. If the server is in use in the Oracle VM environment, place it in maintenance mode first. This protects your virtual infrastructure against data corruption, and allows it to remain in service as long as the configuration of your environment allows it.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.10 Service Procedures for Sun Server X4-2 Components

Replaceable Part(s)	Hot-Swap	URL
Storage drives	Yes	http://docs.oracle.com/cd/E36975_01/html/E38045/z40000091011460.html#scrolltoc
Fan Modules	Yes	http://docs.oracle.com/cd/E36975_01/html/E38045/z40000091014194.html#scrolltoc
Power supplies	Yes	http://docs.oracle.com/cd/E36975_01/html/E38045/z40000091014153.html#scrolltoc
DIMMs (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E36975_01/html/E38045/z40003f01425075.html#scrolltoc
PCI Express risers (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E36975_01/html/E38045/z40000f91037394.html#scrolltoc
PCI Express cards (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E36975_01/html/E38045/z40000f91037409.html#scrolltoc
Internal USB flash drives (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E36975_01/html/E38045/z4000a6d1442801.html#scrolltoc
Battery	No	http://docs.oracle.com/cd/E36975_01/html/E38045/z40003f01423753.html#scrolltoc

5.5 Servicing a Sun Server X3-2

This section provides instructions to service replaceable components (CRUs/FRUs) in a Sun Server X3-2 management node or compute node. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.5.1 Powering Down Sun Server X3-2 for Service (When Required)

If you need to execute a service procedure that requires the Sun Server X3-2 to be powered down, follow these instructions:

Note

The management nodes are not placed in maintenance node for servicing. If you need to power down the master management node, bring it offline as described below and wait for the other management node to take over the master role. If you need to power down the secondary management node, no additional steps are required.

Placing a compute node into maintenance mode

Before a Sun Server X3-2 compute node can be powered down, it must be placed into maintenance mode from within Oracle VM Manager. As a result, all virtual machines running on the compute node are automatically migrated to other servers in the Oracle VM server pool, if they are available. For details, refer to the section “Placing an Oracle VM Server into Maintenance Mode” in the Oracle VM User's Guide.

1. Log in to the Oracle VM Manager Web UI.

   For details, refer to the section “Section 3.2, “Logging in to the Oracle VM Manager Web UI”” in the Oracle Virtual Compute Appliance Administrator's Guide.

   a. Enter the following address in a Web browser: https://*manager-vip*:7002/ovm/console.

      Replace *manager-vip* with the virtual IP address, or corresponding host name, that you have configured for your management nodes during installation.

   b. Enter the Oracle VM Manager user name and password in the respective fields and click OK.

2. In the **Servers and VMs** tab, select the Oracle VM Server in the navigation pane. Click **Edit Server** in the management pane toolbar.

   The **Edit Server** dialog box is displayed.

3. Select the **Maintenance Mode** check box to place the Oracle VM Server into maintenance mode. Click OK.

   The Oracle VM Server is in maintenance mode and ready for servicing.

4. When the Sun Server X3-2 is ready to rejoin the Oracle VM server pool, perform the same procedure and clear the **Maintenance Mode** check box.

Powering down the system

These steps briefly describe the procedure. For detailed instructions, refer to the chapter “Preparing for Service” in the Sun Server X3-2 Service Manual (part no. E22313).

1. Power down the server gracefully whenever possible.

The easiest way is to press and quickly release the Power button on the front panel.

2. Perform immediate shutdown only if the system does not respond to graceful power-down tasks.

Caution

System data may become corrupted during an immediate power down. Use this task only after attempting to power down the server gracefully.

3. Extend the server to the maintenance position.
4. Disconnect the power cables and data cables from the server.
5. Most service operations can be performed while the server is in the maintenance position.

   However, if necessary, remove the cable management arm (CMA) and pull the server out of the rack.

Caution

The server weighs approximately 18.1 kg (39.9 lb). Two people are required to dismount and carry the chassis.

Returning the system to operation

These steps briefly describe the procedure. For detailed instructions, refer to the chapter "Returning the Server to Operation" in the Sun Server X3-2 Service Manual (part no. E22313).

1. If the top cover was removed to service a component, reinstall the top cover on the server.
2. If the server was removed, reinstall it into the rack.
3. Reconnect data cables and power cords.
4. Return the server to its normal operational position in the rack, making sure the CMA is correctly installed.
5. Power on the server.

5.5.2 Service Procedures for Sun Server X3-2 Components

For parts that are not hot-swappable, power down the Sun Server X3-2 before starting the service procedure. If the server is in use in the Oracle VM environment, place it in maintenance mode first. This protects your virtual infrastructure against data corruption, and allows it to remain in service as long as the configuration of your environment allows it.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.11 Service Procedures for Sun Server X3-2 Components

Replaceable Part(s)	Hot-Swap	URL
Storage drives	Yes	http://docs.oracle.com/cd/E22368_01/html/E27242/z40000091011460.html#scrolltoc

Replaceable Part(s)	Hot-Swap	URL
Fan Modules	Yes	http://docs.oracle.com/cd/E22368_01/html/E27242/z40000091014194.html#scrolltoc
Power supplies	Yes	http://docs.oracle.com/cd/E22368_01/html/E27242/z40000091014153.html#scrolltoc
DIMMs (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E22368_01/html/E27242/z40003f01425075.html#scrolltoc
PCI Express risers (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E22368_01/html/E27242/z40000f91037394.html#scrolltoc
PCI Express cards (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E22368_01/html/E27242/z40000f91037409.html#scrolltoc
Internal USB flash drives (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E22368_01/html/E27242/z4000a6d1442801.html#scrolltoc
Battery	No	http://docs.oracle.com/cd/E22368_01/html/E27242/z40003f01423753.html#scrolltoc

5.6 Servicing the Oracle ZFS Storage Appliance ZS3-ES

This section provides instructions to service replaceable components (CRUs/FRUs) in the Oracle ZFS Storage Appliance ZS3-ES. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.6.1 Powering Down the Oracle ZFS Storage Appliance ZS3-ES for Service (When Required)

If you need to execute a service procedure that requires the Oracle ZFS Storage Appliance ZS3-ES to be powered down, follow these instructions:

Powering down the storage head/controller

Performing a graceful shutdown ensures that data is saved and not corrupted, and that resources are assigned to the other controller in the storage head cluster. This is the preferred method for powering down a controller for component replacement.

1. Ensure that Ethernet cables are connected from your network to the `NET-0` port on the back of each server.
2. Direct your web browser to the server to be serviced by using either the IP address or host name assigned to the NET-0 port as follows: `https://ipaddress:215`.
3. Log in as root, using the system-wide Oracle Virtual Compute Appliance password.
4. Go to **Maintenance** > **Hardware**.
5. Click the **Show Details** link for the server.

6. Click the Power icon for the server and select **Power off** from the pull-down list.

If graceful shutdown is not possible, use the power button.

Caution

This task forces the main power off. You might corrupt or lose system data, or lose the server configuration (the resources assigned to it) during an immediate power down.

1. Press and quickly release the Power button on the front panel.

   This action causes an orderly shutdown of the operating system, and the server enters the standby power mode.

2. If the server did not respond or you need a more immediate shutdown, press and hold the Power button for four seconds.

   This forces the main power off and enters the standby power mode immediately. When the main power is off, the Power/OK LED on the front panel begins flashing, indicating that the server is in standby power mode.

If neither graceful shutdown nor emergency shutdown using the power button is possible, for example because you are not physically located at the system, use the ILOM to perform an emergency shutdown. Choose one of the following options:

Caution

This task forces the main power off. You might corrupt or lose system data, or lose the server configuration (the resources assigned to it) during an immediate power down.

- Log in to the **Oracle ILOM web interface**.

  In the left pane, click Host Management > Power Control, and in the Actions list click **Immediate Power Off**.

  Click Save, and then click OK.

- Log in to the **Oracle ILOM command-line interface** (CLI).

  At the CLI prompt, type the following command: `stop -f /System`.

Powering down the disk shelf

Do not remove a component if you do not have an immediate replacement. The disk shelf must not be operated without all components in place. Powering down or removing all SAS chains from a disk shelf will cause the controllers to panic to prevent data loss. To avoid this, shut down the controllers before decommissioning the shelf.

1. Stop all input and output to and from the disk shelf.
2. Wait approximately two minutes until all disk activity indicators have stopped flashing.
3. Place the power supply on/off switches to the "O" off position.
4. Disconnect the power cords from the external power source.

Powering on the storage appliance

The disk shelf must not be operated without all components in place.

1. Reconnect the disk shelf power and data cables you removed to service a component.
2. Place the power supply on/off switches on the disk shelf to the "I" on position.
3. Wait several minutes until the boot process is complete, at which time the Power LED should be solid green.
4. Connect the storage head power and data cables you removed to service a component.
5. Power on the server by pressing the Power button on the front panel.

   If you are not physically located at the system, use either of these ILOM methods instead:

   - Log in to the **Oracle ILOM web interface**.

     In the left pane, click Host Management > Power Control, and in the Actions list click **Power On**.

   - Log in to the **Oracle ILOM command-line interface** (CLI).

     At the CLI prompt, type the following command: `start /System`.
6. Wait approximately two minutes until the power-on self-test (POST) code checkpoint tests have completed, and the Power/OK LED on the front panel lights and remains lit.
7. If you performed a graceful shutdown earlier, return resources to the server that was just serviced.

   a. Log into the web UI for the server that was not serviced.

   b. Go to Configuration > Cluster.

   c. Click **Failback**.

Note

For information about configuring the clustered servers and attached disk shelves, see the “Oracle ZFS Storage System Administration Guide” for the appropriate software release.

5.6.2 Service Procedures for Oracle ZFS Storage Appliance ZS3-ES Components

For parts that are not hot-swappable, power down the Oracle ZFS Storage Appliance ZS3-ES before starting the service procedure.

Warning

If you need to execute a service procedure that interrupts the connection between virtual machines and their virtual disks, shut down the virtual machines in Oracle VM Manager prior to servicing the storage hardware. Disconnecting a running virtual machine from its disks may cause data corruption.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following

table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.12 Service Procedures for Oracle ZFS Storage Appliance ZS3-ES Components

Replaceable Part(s)	Hot-Swap	URL
Storage head hard drives	Yes	http://docs.oracle.com/cd/E37831_01/html/E48559/z40000091011460.html#scrolltoc
Disk shelf drives	Yes	Refer to the section “Replacing a Drive” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc
Fan modules	Yes	http://docs.oracle.com/cd/E37831_01/html/E48559/z40000091014194.html#scrolltoc
Storage head power supplies	Yes	http://docs.oracle.com/cd/E37831_01/html/E48559/z40000091014153.html#scrolltoc
Disk shelf power supplies	Yes	Refer to the section “Replacing a Power Supply” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc
Memory modules (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E37831_01/html/E48559/z40003f01425075.html#scrolltoc
PCI Express risers (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E37831_01/html/E48559/z40000f91037394.html#scrolltoc
PCI Express cards (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E37831_01/html/E48559/z40000f91037409.html#scrolltoc
Internal USB flash drive (Oracle-qualified service technician only)	No	http://docs.oracle.com/cd/E37831_01/html/E48559/z4000a6d1442801.html#scrolltoc
Battery	No	http://docs.oracle.com/cd/E37831_01/html/E48559/z40003f01423753.html#scrolltoc
Disk shelf I/O modules (Oracle-qualified service technician only)	Yes	Refer to the section “Replacing an I/O Module” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc
Disk shelf SIM boards (Oracle-qualified service technician only)	Yes	Refer to the section “Replacing a SIM Board” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc

5.7 Servicing the Sun ZFS Storage Appliance 7320

This section provides instructions to service replaceable components (CRUs/FRUs) in the Sun ZFS Storage Appliance 7320. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.7.1 Powering Down the Sun ZFS Storage Appliance 7320 for Service (When Required)

If you need to execute a service procedure that requires the Sun ZFS Storage Appliance 7320 to be powered down, follow these instructions:

Powering down the storage head/controller

Powering down or removing all SAS chains from a disk shelf will cause the controllers to panic to prevent data loss. To avoid this, shut down the controllers before decommissioning the shelf.

1. Log in to the BUI.
2. Click the Power icon on the left side of the masthead.

If the BUI is not accessible, select one of the following options:

Note

In a configuration with clustered storage heads, always shut down the standby head before the active head.

- SSH into the appliance and issue the `maintenance system poweroff` command.
- SSH or serial console into the service processor (SP) and issue the `stop /SYS` command.
- Use a pen or non-conducting pointed object to press and release the Power button on the front panel.

Caution

To initiate emergency shutdown during which all applications and files will be closed abruptly without saving, press and hold the power button for at least four seconds until the Power/OK status indicator on the front panel flashes, indicating that the storage controller is in standby power mode.

Powering down the disk shelf

Do not remove a component if you do not have an immediate replacement. The disk shelf must not be operated without all components in place. Powering down or removing all SAS chains from a disk shelf will cause the controllers to panic to prevent data loss. To avoid this, shut down the controllers before decommissioning the shelf.

1. Stop all input and output to and from the disk shelf.
2. Wait approximately two minutes until all disk activity indicators have stopped flashing.
3. Place the power supply on/off switches to the "O" off position.
4. Disconnect the power cords from the external power source.

Powering on the storage appliance

The disk shelf must not be operated without all components in place.

1. Reconnect the disk shelf power and data cables you removed to service a component.
2. Place the power supply on/off switches on the disk shelf to the "I" on position.
3. Wait several minutes until the boot process is complete, at which time the Power LED should be solid green.

4. Connect the storage head power cables and wait approximately two minutes until the Power/OK LED on the front panel next to the Power button lights and remains lit.

5.7.2 Service Procedures for Sun ZFS Storage Appliance 7320 Components

For parts that are not hot-swappable, power down the Sun ZFS Storage Appliance 7320 before starting the service procedure.

Warning

If you need to execute a service procedure that interrupts the connection between virtual machines and their virtual disks, shut down the virtual machines in Oracle VM Manager prior to servicing the storage hardware. Disconnecting a running virtual machine from its disks may cause data corruption.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.13 Service Procedures for Sun ZFS Storage Appliance 7320 Components

Replaceable Part(s)	Hot-Swap	URL
Storage head HDDs or SSDs	Yes	http://docs.oracle.com/cd/E28317_01/html/E38247/maintenance__hardware__details__7x20.html#maintenance__hard
Disk shelf drives	Yes	Refer to the section “Replacing a Drive” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc
Fan modules	Yes	http://docs.oracle.com/cd/E28317_01/html/E38247/maintenance__hardware__details__7x20.html#maintenance__hard
Storage head power supplies	Yes	http://docs.oracle.com/cd/E28317_01/html/E38247/maintenance__hardware__details__7x20.html#maintenance__hard
Disk shelf power supplies	Yes	Refer to the section “Replacing a Power Supply” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc
Memory modules	No	http://docs.oracle.com/cd/E28317_01/html/E38247/maintenance__hardware__details__7x20.html#maintenance__hard
PCI Express risers and cards	No	http://docs.oracle.com/cd/E28317_01/html/E38247/maintenance__hardware__details__7x20.html#maintenance__hard
Battery	No	http://docs.oracle.com/cd/E28317_01/html/E38247/maintenance__hardware__details__7x20.html#maintenance__hard
System indicator boards	Yes	http://docs.oracle.com/cd/E26765_01/html/E26399/maintenance__hardware__details__7x20.html#maintenance__hard
Disk shelf I/O modules	Yes	Refer to the section “Replacing an I/O Module” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc
Disk shelf SIM boards	Yes	Refer to the section “Replacing a SIM Board” on this page: http://docs.oracle.com/cd/E27998_01/html/E48492/maintenance__hardware__procedures__shelf.html#scrolltoc

5.8 Servicing an Oracle Switch ES1-24

This section provides instructions to service replaceable components (CRUs/FRUs) in an Oracle Switch ES1-24. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.8.1 Powering Down the Oracle Switch ES1-24 for Service (When Required)

If you need to execute a service procedure that requires the Oracle Switch ES1-24 to be powered down, follow these instructions:

Powering down the switch

1. To power down an individual power supply, remove its power cord.
2. To power down the switch, remove the power cords from both power supplies.

Returning the switch to operation

1. Reconnect the power cords to both power supplies.
2. Verify that the switch has power by checking the status LEDs.

   The AC LED lights green to indicate the power supply is connected to line power. A moment later, the OK LED lights green to indicate the power supply is fully operational.

5.8.2 Service Procedures for Oracle Switch ES1-24 Components

For parts that are not hot-swappable, power down the Oracle Switch ES1-24 before starting the service procedure.

Warning

Internal Ethernet connectivity is affected while the component is out of service. Please take the necessary precautions.

Caution

When replacing the entire switch assembly, begin by saving the configuration from the existing component, so that you can restore the configuration after replacement.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.14 Service Procedures for Oracle Switch ES1-24 Components

Replaceable Part(s)	Hot-Swap	URL
Power supplies	Yes	http://docs.oracle.com/cd/E39109_01/html/E39116/z40000349112.html#scrolltoc
Fan module	Yes	http://docs.oracle.com/cd/E39109_01/html/E39116/z40000369112.html#scrolltoc

5.9 Servicing an NM2-36P Sun Datacenter InfiniBand Expansion Switch

This section provides instructions to service replaceable components (CRUs/FRUs) in a NM2-36P Sun Datacenter InfiniBand Expansion Switch. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.9.1 Powering Down the NM2-36P Sun Datacenter InfiniBand Expansion Switch for Service (When Required)

If you need to execute a service procedure that requires the NM2-36P Sun Datacenter InfiniBand Expansion Switch to be powered down, follow these instructions:

Powering down the switch

1. To power down an individual power supply, remove its power cord.
2. To power down the switch, remove the power cords from both power supplies.

Returning the switch to operation

1. Reconnect the power cords to both power supplies.
2. Verify that the switch has power by checking the status LEDs.

   The AC LED lights green to indicate the power supply is connected to line power. A moment later, the OK LED lights green to indicate the power supply is fully operational.

5.9.2 Service Procedures for NM2-36P Sun Datacenter InfiniBand Expansion Switch Components

For parts that are not hot-swappable, power down the NM2-36P Sun Datacenter InfiniBand Expansion Switch before starting the service procedure.

Caution

InfiniBand connectivity may be affected while the component is out of service. Please take the necessary precautions.

Caution

When replacing the entire switch assembly, begin by saving the configuration from the existing component, so that you can restore the configuration after replacement.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.15 Service Procedures for NM2-36P Sun Datacenter InfiniBand Expansion Switch Components

Replaceable Part(s)	Hot-Swap	URL
Power supplies	Yes	http://docs.oracle.com/cd/E26698_01/html/E26434/z40001f49112.html#scrolltoc
Fans	Yes	http://docs.oracle.com/cd/E26698_01/html/E26434/z40001f59112.html#scrolltoc

Replaceable Part(s)	Hot-Swap	URL
Data cables	Yes	http://docs.oracle.com/cd/E26698_01/html/E26434/z40001f69112.html#scrolltoc

5.10 Servicing an Oracle Fabric Interconnect F1-15 Director Switch

This section provides instructions to service replaceable components (CRUs/FRUs) in an Oracle Fabric Interconnect F1-15 Director Switch. Before starting any service procedure, read and follow the guidelines in Section 5.2, “Preparing Oracle Virtual Compute Appliance for Service”.

5.10.1 Powering Down the Oracle Fabric Interconnect F1-15 Director Switch for Service (When Required)

If you need to execute a service procedure that requires the Oracle Fabric Interconnect F1-15 Director Switch to be powered down, follow these instructions:

Powering down the fabric director switch

1. Press the Power button to power down the Oracle Fabric Interconnect F1-15 Director Switch gracefully.
2. Wait for the Status LED to switch off, indicating that the component has been powered down successfully.

Returning the fabric director switch to operation

1. Press the Power button to power on the Oracle Fabric Interconnect F1-15 Director Switch.

   The Status LED blinks green, indicating that the system control processor is booting.
2. Wait until the Status LED is solid green.

   This indicates that the system control processor has finished booting and the fabric director is ready for operation.

5.10.2 Service Procedures for Oracle Fabric Interconnect F1-15 Director Switch Components

For parts that are not hot-swappable, power down the Oracle Fabric Interconnect F1-15 Director Switch before starting the service procedure.

Caution

Management, storage, VM and external network connectivity may be affected while the fabric director switch or an I/O module is out of service. Please take the necessary precautions.

Caution

When replacing the entire switch assembly, begin by saving the configuration from the existing component, so that you can restore the configuration after replacement.

Generally speaking, hot-swappable components can be serviced without specific additional steps for Oracle Virtual Compute Appliance. Follow the applicable procedure in the Service Manual. The following table provides links to each service procedure and indicates whether parts are hot-swappable or require the component to be taken offline and powered down.

Table 5.16 Service Procedures for Oracle Fabric Interconnect F1-15 Director Switch Components

Replaceable Part(s)	Hot-Swap	URL
Power supplies (Oracle-qualified service technician only)	Yes	In the Oracle Fabric Director Hardware and Host Drivers Installation Guide, refer to the following section: Chapter 7 (page 179): “Performing Service Tasks”, page 189: “Removing VP780 Power Supplies”. Installation is the reverse of this procedure.
Fan modules (Oracle-qualified service technician only)	Yes	In the Oracle Fabric Director Hardware and Host Drivers Installation Guide, refer to the following section: Chapter 7 (page 179): “Performing Service Tasks”, page 184: “Removing VP780 Fan Modules”. Installation is the reverse of this procedure.
Fabric board (Oracle-qualified service technician only)	No	In the Oracle Fabric Director Hardware and Host Drivers Installation Guide, refer to the following section: Chapter 7 (page 179): “Performing Service Tasks”, page 202: “Replacing the VP780 QDR Fabric Board”.
Management module (Oracle-qualified service technician only)	No	In the Oracle Fabric Director Hardware and Host Drivers Installation Guide, refer to the following section: Chapter 7 (page 179): “Performing Service Tasks”, page 235: “Removing and Installing a VP780 Management Module”.
I/O modules (Oracle-qualified service technician only)	Yes	In the Oracle Fabric Director Hardware and Host Drivers Installation Guide, refer to the following section: Chapter 7 (page 179): “Performing Service Tasks”, page 224: “Removing and Installing VP780 I/O Modules”.  **Caution** The latest generation I/O modules have no Eject button and are powered down from the CLI. For detailed instructions, please refer to the support note with Doc ID 1518778.1.
Front panel assembly, including system control processor (Oracle-qualified service technician only)	No	In the Oracle Fabric Director Hardware and Host Drivers Installation Guide, refer to the following section: Chapter 7 (page 179): “Performing Service Tasks”, page 250: “Removing and Installing a VP780 Front Panel Assembly”.  **Caution** When replacing the system control processor (SCP), which is included in the front panel

Replaceable Part(s)	Hot-Swap	URL	
			assembly, begin by saving the configuration from the existing SCP, so that you can restore the configuration after replacement.

Chapter 6 Troubleshooting

Table of Contents

This chapter describes how to resolve a number of common problem scenarios.

6.1 Adding Proxy Settings for Oracle Virtual Compute Appliance Updates

If your data center does not provide unlimited internet access and has a proxy server in place to control HTTP, HTTPS or FTP traffic, you may need to configure your management nodes to be able to access external resources for the purpose of performing software updates.

The following instructions must be followed for each of the two management nodes in your environment.

Adding Proxy Settings for a Management Node

1. Gain command line access to the management node. Usually this is achieved using SSH and logging in as the root user with the global Oracle Virtual Compute Appliance password.

2. Use the `ovca-config` script to add, view or modify your proxy settings. This script safely reads and edits the `/etc/ovca.conf` file, to prevent the possibility of configuration file corruption.

   To view the current values for the configurable settings in the configuration file run the script as follows:

   ```
   # ovca-config -r
   ```

   To set an HTTP proxy:

   ```
   # ovca-config --http "http://IP:PORT"
   ```

   Where *IP* is the IP address of your proxy server, and *PORT* is the TCP port on which it is listening. If your proxy server expects a user name and password, this can be specified in the following format:

   ```
   "http://username:password@IP:PORT"
   ```

   To set an HTTPS proxy:

   ```
   # ovca-config --https "http://IP:PORT"
   ```

To set an FTP proxy:

```
# ovca-config --ftp "http://IP:PORT"
```

Proxy options can be chained together into a single command:

```
# ovca-config --http "http://IP:PORT" --ftp "http://IP:PORT"
```

Finally, to view the `ovca-config` help, use the *`-h`* or *`--help`* parameter.

3. Setting any single parameter automatically rewrites the configuration file and the proxy settings become active immediately.

6.2 Setting the Oracle Virtual Compute Appliance Logging Parameters

When troubleshooting or if you have a support query open, you may be required to change the logging parameters for your Oracle Virtual Compute Appliance. The settings for this are contained in `/etc/ovca.conf`, and can be changed using the `ovca-config` script.

The following instructions must be followed for each of the two management nodes in your environment.

Changing the Oracle Virtual Compute Appliance Logging Parameters for a Management Node

1. Gain command line access to the management node. Usually this is achieved using SSH and logging in as the root user with the global Oracle Virtual Compute Appliance password.
2. Use the `ovca-config` script to add, view or modify your appliance log settings. This script safely reads and edits the `/etc/ovca.conf` file, to prevent the possibility of configuration file corruption.
   - To view the current values for the configurable settings in the configuration file run the script as follows:

     ```
     # ovca-config -r
     ```

   - To change the log level:

     ```
     # ovca-config --loglevel LEVEL
     ```

     Where *`LEVEL`* is one of the following: `DEBUG`, `INFO`, `WARNING`, `ERROR`, `CRITICAL`.

   - To change the log file size:

     ```
     # ovca-config --logfile-max-size SIZE
     ```

     Where *`SIZE`*, expressed in MB, is a number from 1 to 512.

   - To change the number of backup log files stored:

     ```
     # ovca-config --logfile-backup-count COUNT
     ```

     Where *`COUNT`* is a number of files ranging from 0 to 100.

Caution

While it is possible to change the log path using this tool, it is not generally recommended.

3. The new log level setting only takes effect after a management node has been rebooted.

6.3 Configuring Data Center Switches for VLAN Traffic

The Oracle Virtual Compute Appliance network infrastructure supports the use of VLANs by default. For this purpose, the Oracle Fabric Interconnect F1-15 Director Switches are set to trunking mode to allow tagged data traffic. You may implement VLANs for logical separation of different network segments, or to define security boundaries between networks with different applications – just as you would with physical servers instead of virtual machines.

However, to allow virtual machines hosted by the Oracle Virtual Compute Appliance to communicate with systems external to the appliance, you must update the configuration of your next-level data center switches accordingly.

- The switch ports on the receiving end of the outbound appliance connections must be part of each VLAN used within the Oracle Virtual Compute Appliance environment.
- The same ports must also be part of the network(s) connecting the external systems that your virtual machines need to access. For example, WAN connectivity implies that virtual machines are able to reach the public gateway in your data center. As an alternative to VLAN tagging, Layer 3 routing can be used to connect to the Oracle Virtual Compute Appliance.

6.4 Verifying and Re-applying Oracle VM Manager Tuning after Software Update

During a software update from Release 1.0.2 to Release 1.1.1 it may occur that certain Oracle VM Manager tuning settings are not applied properly and default settings are used instead. After updating the Oracle Virtual Compute Appliance software stack, you must verify these tuning settings, and re-apply them if necessary. Run the following procedure:

Verifying Oracle VM Manager Tuning Settings

1. Using SSH and an account with superuser privileges, log into the master management node.

Note

The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

2. Verify that you are logged in to the **master** management node.

```
[root@ovcamn05r1 ~]# ovca-check-master
NODE: 192.168.4.3  MASTER: True
```

If the command returns `MASTER: False`, log in to the other management node and run the same command.

3. Log in to the Oracle VM shell as the `admin` user.

```
# /usr/bin/ovm_shell.sh -u admin
Password:
OVM Shell: 3.2.<version_id> Interactive Mode
---
```

```
>>>
```

4. At the Oracle VM shell prompt, enter the following command:

```
>>> OvmClient.getOvmManager().getFoundryContext().getModelManager().getMaxCacheSize()
150000
>>>
```

   To exit Oracle VM shell, press `Ctrl+D`.

   If the value returned is **not** `300000`, proceed with the next step.

5. From the Oracle Linux command line on the master management node, apply the required Oracle VM Manager tuning settings by running the following Oracle VM shell script as the `admin` user:

```
# /usr/bin/ovm_shell.sh -u admin -i /var/lib/ovca/ovm_scripts/ovmm_tuning.py
Password:
live events max age: 24 hours
archive events max age: 72 hours
max cache size: 150000 objects
live jobs max age: 168 hours
archive jobs max age: 14 hours
live jobs max age (after): 24 hours
archive jobs max age (after): 168 hours
live events max age (after): 3 hours
archive events max age (after): 6 hours
max cache size (after): 300000 objects
```

6. When the tuning script completes successfully, log out of the master management node.

6.5 Upgrading Existing Compute Node Configuration to Release 1.1.1

When you run a Software Update on an existing Oracle Virtual Compute Appliance installation with controller software Release 1.0.2, you must execute an additional upgrade procedure on provisioned compute nodes. The procedure is designed to reconfigure the compute node storage connections and the Oracle VM Agent, allowing the compute node to continue to function reliably as a member of the clustered server pool after the software update. By following the instructions in this section, you also make sure that previously deployed virtual machines remain fully functional when the appliance update to Release 1.1.1 is complete.

Caution

Execute this procedure on each compute node provisioned with software Release 1.0.2, *after* the Release 1.1.1 software update on the management nodes has completed successfully.

Note

A large part of this procedure must be executed from Oracle VM Manager. An overview of its usage in the context of Oracle Virtual Compute Appliance, and links to detailed instructions in the Oracle VM documentation, are provided in this Administrator's Guide, in Chapter 3, *Managing the Oracle VM Virtual Infrastructure*.

Upgrading the Compute Node Configuration from Release 1.0.2 to Release 1.1.1

1. Make sure that the appliance software has been updated successfully to Release 1.1.1.

   You can verify this by logging into the master management node and entering the following command:

```
# ovca-diag version
1.1.1_381_2014-03-20
```

2. Log in to Oracle VM Manager.

   For details, see Section 3.2, “Logging in to the Oracle VM Manager Web UI”.

3. Identify the master server in the server pool.

   a. In the **Servers and VMs** tab, select the server pool in the navigation pane.

   b. In the management pane, select the **Info** perspective from the list in the toolbar.

      A configuration overview of the server pool is displayed.

   c. Locate the *Master Server* setting and write down which server is the pool master.

Warning

The server pool master server must be the last Oracle VM Server to go through this upgrade procedure.

4. Migrate all running virtual machines away from the compute node you want to upgrade.

   Information on migrating virtual machines is provided in the Oracle VM User's Guide section entitled Migrating Virtual Machines.

5. Place the compute node in maintenance mode.

   Information on maintenance mode is provided in the Oracle VM User's Guide section entitled Placing an Oracle VM Server into Maintenance Mode.

   a. In the **Servers and VMs** tab, select the Oracle VM Server in the navigation pane. Click **Edit Server** in the management pane toolbar.

      The **Edit Server** dialog box is displayed.

   b. Select the **Maintenance Mode** check box to place the Oracle VM Server into maintenance mode. Click OK.

      The Oracle VM Server is in maintenance mode and ready for servicing.

6. Install the `ovca-support` package by executing the steps described in Section 6.6, “Enabling Support Tools on Systems Provisioned with Software Release 1.0.2”. However, do not log out of the compute node yet.

7. From the Oracle Linux command line on the compute node, run this script:

```
# /usr/sbin/cn_upg_111.sh
```

8. When the upgrade script completes successfully, log out of the compute node and return to the Oracle VM Manager UI.

9. Run the Oracle VM Server update on the compute node in question.

   Information on the Oracle VM Server update functionality is provided in the Oracle VM User's Guide section entitled Updating and Upgrading Oracle VM Servers.

   a. In the **Servers and VMs** tab, select the server pool in the navigation pane.

b. In the management pane, select the **Servers** perspective from the list in the toolbar.

   A table is displayed with all servers in the server pool.

c. Select the appropriate compute node in the management pane table and click **Update Server** in the management pane toolbar.

   As part of the update procedure, the Oracle VM Server is restarted but remains in maintenance mode.

Warning

If the compute node does not reboot during the update, you must restart it from within Oracle VM Manager.

10. Take the compute node out of maintenance mode.

    a. In the **Servers and VMs** tab, select the Oracle VM Server in the navigation pane. Click **Edit Server** in the management pane toolbar.

       The **Edit Server** dialog box is displayed.

    b. Clear the **Maintenance Mode** check box. Click OK.

       The Oracle VM Server rejoins the server pool as a fully functioning member.

11. If the compute node is in *WARNING* status, unpresent the *Rack1-Repository* from this node, and remove the node from the *Rack1_ServerPool*.

    a. In the **Repositories** tab, select the *Rack1-Repository* in the management pane. Click **Present/ Unpresent Repository** in the management pane toolbar.

       The **Present Repository to Servers** dialog box is displayed.

    b. Select the **Servers** option at the top of the dialog box. Move the server in question out of the *Present to Server* pane. Click OK.

       The repository is unpresented from the selected Oracle VM Server.

    c. In the **Servers and VMs** tab, select *Rack1_ServerPool* and click **Edit Server Pool**.

       The **Edit Server Pool** dialog box is displayed.

    d. In the **Servers** tab of the **Edit Server Pool** dialog box, move the server in question out of the *Selected Servers* pane. Click OK.

       The Oracle VM Server is removed from the server pool.

12. Repeat this procedure for each compute node that requires upgrade from Release 1.0.2 to Release 1.1.1.

Warning

The server pool master server must be the last Oracle VM Server to go through this upgrade procedure.

13. When all compute nodes have been upgraded and rebooted successfully, acknowledge all events for the Oracle VM Servers and the *Rack1-Repository*.

    Information on acknowledging events is provided in the Oracle VM User's Guide section entitled Acknowledging Events/Errors.

14. Remove the stale LUN mappings left behind from the previous storage configuration.

    a. Go to the **Storage** tab of the Oracle VM Manager UI.

    b. In the navigation pane, select the SAN Server named *OVCA_ZFSSA_Rack1*.

    c. In the management pane, select the LUN or LUNs in *WARNING* status and click **Delete Physical Disk** in the toolbar.

15. Re-add any node that was removed from the *Rack1_ServerPool*. Make sure the *Rack1-Repository* is presented to all servers in the pool.

The software update from Release 1.0.2 to Release 1.1.1 is now complete. The Oracle Virtual Compute Appliance is ready to resume all normal operations.

6.6 Enabling Support Tools on Systems Provisioned with Software Release 1.0.2

Oracle Virtual Compute Appliance controller software Release 1.1.1 and later installs the support tools on the management nodes and compute nodes. However, compute nodes provisioned and discovered in an earlier release do not have the packages for these support tools. After you update the appliance software to Release 1.1.1, any compute node you provision or reprovision will be installed with the Oracle Virtual Compute Appliance support tools. On running compute nodes that were previously provisioned, and already host virtual machines, you can install the support tools manually by following the instructions in this section.

Installing Support Tools Manually on a Compute Node

1. Make sure that the appliance software has been updated successfully to Release 1.1.1.

2. Using SSH and an account with superuser privileges, log into the compute node where you want to install the support tools.

   You can connect to a compute node from a workstation connected to the appliance management network. Alternatively, log into a management node first, and then connect to the compute node through either the appliance management network (`192.168.4.x`) or the Oracle VM management network (`192.168.140.x`). The IP address of a discovered compute node can be found in the *Servers and VMs* tab of Oracle VM Manager.

   Note

   The management node data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]# ssh root@192.168.4.106
root@192.168.4.106's password:
[root@ovcacn09r1 ~]#
```

3. On the compute node, mount the shared partition on the storage appliance where the software install media is unpacked.

```
[root@ovcacn09r1 ~]# mkdir /tmp/shared_storage
[root@ovcacn09r1 ~]# mount 192.168.40.1:/export/MGMT_ROOT /tmp/shared_storage
```

4. Locate and install the `ovca-support` package.

```
[root@ovcacn09r1 ~]# ls -l /tmp/shared_storage/ovm_image/Server/ovca-support*
-r--r--r--+ 1 root root 162726 Mar 23 16:14 /tmp/shared_storage/ovm_image/Server/ \
ovca-support-1.1.1-106.el5.noarch.rpm
[root@ovcacn09r1 ~]# rpm -ivh /tmp/shared_storage/ovm_image/Server/ovca-support*
warning: /tmp/shared_storage/ovm_image/Server/ovca-support-1.1.1-106.el5.noarch.rpm:
    Header V3 DSA signature: NOKEY, key ID 1e5e0159
    Preparing...                ########################################### [100%]
       1:ovca-support           ########################################### [100%]
[root@ovcacn09r1 ~]#
```

5. Verify that the package has been installed correctly, for example by checking the software version as follows:

```
[root@ovcacn09r1 ~]# ovca-diag version
1.1.1_381_2014-03-20
[root@ovcacn09r1 ~]#
```

6. Unmount the shared partition and remove the temporary directory you created.

```
[root@ovcacn09r1 ~]# umount /tmp/shared_storage
[root@ovcacn09r1 ~]# rmdir /tmp/shared_storage
[root@ovcacn09r1 ~]#
```

7. Log out of the compute node.

8. Repeat this procedure on all other compute nodes installed in your Oracle Virtual Compute Appliance environment.

6.7 Enabling Compute Node IPMI in Oracle VM Manager

Oracle Virtual Compute Appliance controller software Release 1.1.1 and later automatically configures the Intelligent Platform Management Interface (IPMI) for all compute nodes in Oracle VM Manager. Compute nodes provisioned and discovered in an earlier release do not have IPMI enabled in Oracle VM Manager. If compute nodes are shut down and have no IPMI configured, they must be powered on by pressing the power button on the front panel of the server. To be able to control the power status of compute nodes remotely, you may add their IPMI configuration manually by following the instructions in this section.

Note

The compute node's IPMI is the built-in Oracle Integrated Lights Out Manager (ILOM). Its default user name is `root` ; the default password is `Welcome1` . Look up the ILOM IP in the Hardware View of the Oracle Virtual Compute Appliance Dashboard: roll the mouse over the compute node in question and note the IP address in the pop-up window.

Configuring IPMI for Compute Nodes

1. Log in to the Oracle VM Manager UI.

   For details, see Section 3.2, “Logging in to the Oracle VM Manager Web UI”.

2. Go to the **Servers and VMs** tab.

3. In the navigation pane, select the compute node you wish to control through the IPMI.

In the toolbar, click `Edit Server`.

4. In the Edit Server dialog box, go to the `IPMI` tab.
5. In the IPMI tab, make the following changes:
   - Select the *Enable Server IPMI* and *Change IPMI Password* check boxes.
   - Enter the administrative *User Name* and *Password* in the respective fields.
   - Enter the *IP Address* for the IPMI of this compute node.
6. Click OK. The compute node configuration in Oracle VM Manager is updated.

6.8 Enabling SNMP Server Monitoring

For troubleshooting or hardware monitoring, it may be useful to enable SNMP on the servers in your Oracle Virtual Compute Appliance. While the tools for SNMP are available, the protocol is not enabled by default. This section explains how to enable SNMP with the standard Oracle Linux and additional Oracle Virtual Compute Appliance Management Information Bases (MIBs).

Enabling SNMP on the Management Nodes

1. Using SSH and an account with superuser privileges, log into the management node.

Note

The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

2. Locate the necessary `rpm` packages in the mounted directory `/nfs/shared_storage/mgmt_image/Packages`, which resides in the `MGMT_ROOT` file system on the ZFS storage appliance. The following packages are part of the Oracle Virtual Compute Appliance ISO image, which is either already installed on your system or downloaded and unpacked on the shared storage during the update process:
   - ovca-snmp-0.9-3.el6.x86_64.rpm
   - net-snmp-libs-5.5-49.0.1.el6.x86_64.rpm
   - net-snmp-5.5-49.0.1.el6.x86_64.rpm
   - lm_sensors-libs-3.1.1-17.el6.x86_64.rpm
   - net-snmp-utils-5.5-49.0.1.el6.x86_64.rpm
3. Install these packages by running the following command:

```
# rpm -ivh ovca-snmp-0.9-3.el6.x86_64.rpm net-snmp-libs-5.5-49.0.1.el6.x86_64.rpm \
net-snmp-5.5-49.0.1.el6.x86_64.rpm lm_sensors-libs-3.1.1-17.el6.x86_64.rpm \
net-snmp-utils-5.5-49.0.1.el6.x86_64.rpm
```

4. Create an SNMP configuration file: `/etc/snmp/snmpd.conf`.

   This is a standard sample configuration:

```
rocommunity public
syslocation MyDataCenter
dlmod ovca /usr/lib64/ovca-snmp/ovca.so
```

5. Enable the `snmpd` service.

```
# service snmpd start
```

6. If desired, enable the `snmpd` service on boot.

```
# chkconfig snmpd on
```

7. Open the SNMP ports on the firewall.

```
# iptables -I INPUT -p udp -m udp --dport 161 -j ACCEPT
# iptables -I INPUT -p udp -m udp --dport 162 -j ACCEPT
# iptables-save > /etc/sysconfig/iptables
```

SNMP is now ready for use on this management node. Besides the standard Oracle Linux MIBs, these are also available:

- ORACLE-OVCA-MIB::ovcaVersion
- ORACLE-OVCA-MIB::ovcaSerial
- ORACLE-OVCA-MIB::ovcaType
- ORACLE-OVCA-MIB::ovcaStatus
- ORACLE-OVCA-MIB::nodeTable

Usage examples:

```
# snmpwalk  -v 1 -c public -O e 130.35.70.186 ORACLE-OVCA-MIB::ovcaVersion
# snmpwalk  -v 1 -c public -O e 130.35.70.111 ORACLE-OVCA-MIB::ovcaStatus
# snmpwalk  -v 1 -c public -O e 130.35.70.111 ORACLE-OVCA-MIB::nodeTable
```

8. Repeat this procedure on the second management node.

Enabling SNMP on the Compute Nodes

Note

On Oracle Virtual Compute Appliance compute nodes, `net-snmp`, `net-snmp-utils` and `net-snmp-libs` are already installed at the factory, but the SNMP service is not enabled or configured.

1. Using SSH and an account with superuser privileges, log into the compute node. It can be accessed through the appliance internal management network.

```
ssh root@192.168.4.5
root@192.168.4.5's password:
[root@ovcacn27r1 ~]#
```

2. Create an SNMP configuration file: `/etc/snmp/snmpd.conf` and make sure this line is included:

```
rocommunity public
```

3. Enable the `snmpd` service.

```
# service snmpd start
```

SNMP is now ready for use on this compute node.

4. If desired, enable the `snmpd` service on boot.

```
# chkconfig snmpd on
```

5. Repeat this procedure on all other compute nodes installed in your Oracle Virtual Compute Appliance environment.

6.9 Changing Oracle WebLogic Server Passwords

The Oracle Virtual Compute Appliance Dashboard does not have the functionality to manage the Oracle WebLogic Server passwords. However, for security reasons, it is advisable that you replace the default password. It is not technically required to use the same system password you set in the Dashboard. To make sure that the appliance software can continue to connect to Oracle WebLogic Server, you must configure the new password in two locations:

- the Oracle WebLogic Server Administration Console
- the Oracle Virtual Compute Appliance Password Manager, or Wallet

Changing the Administrative Password in the Oracle WebLogic Server Administration Console

Note

This procedure uses the Administration Console, which is the web UI. If you prefer to use the Oracle WebLogic Scripting Tool (WLST) instead, follow the instructions in the WLST documentation, Chapter 6, “Configuring Existing WebLogic Domains”: Changing a Password.

1. In your browser, enter the address `https://IP:7002/console` .

   In the address, *`IP`* refers to the IP address that you have configured for the management nodes during installation.

2. Log in with the user name `weblogic` and the global password. [1]

3. Change the password of the user named "`weblogic`" by executing the steps described in the section “Change user passwords” in the Oracle WebLogic Server Administration Console Online Help.

Note

The Oracle WebLogic Server instances running on both management nodes work together as a cluster. The password update on one instance is automatically replicated on the other.

Caution

Keep Oracle WebLogic Server and the Password Manager in sync. Otherwise, Oracle Virtual Compute Appliance connections to Oracle WebLogic Server will fail.

Changing the Oracle WebLogic Server Password in the Oracle Virtual Compute Appliance Password Manager (Wallet)

1. Using SSH and an account with superuser privileges, log into the master management node.

[1] The factory-default global password is `Welcome1` .

Note

The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

2. Set a new Wallet entry for the `weblogic` user.

```
# ovca-update-password -t wls
```

Note

Password changes through the Dashboard, which apply to all other system configuration components of Oracle Virtual Compute Appliance, are described in Section 2.4, “Network Setup”.

6.10 Replacing Default Passwords Manually

The password update functionality in the Oracle Virtual Compute Appliance Dashboard is restricted to these system configuration components: the Dashboard UI itself, Oracle VM Manager, the root user account on both management nodes, and the ovs user account of the Oracle VM mySQL database. However, for security reasons, you may prefer to replace the default password for certain user accounts and components. It is not technically required to use the same password you set in the Oracle Virtual Compute Appliance Dashboard. To make sure that the appliance software can continue to connect to all its components, you must configure the new password in two locations:

- the component's access control mechanism; typically a UI or CLI
- the Oracle Virtual Compute Appliance Password Manager (Wallet)

Changing the Administrative Password for an Oracle Virtual Compute Appliance Component

1. Log in to the system component for which you want to change the administrative password. [2]
2. Change the administrative password.

   For instructions, refer to the applicable product documentation. Links to related documentation are listed in the Preface.

Caution

Keep the Password Manager in sync with each of your password changes. Otherwise, Oracle Virtual Compute Appliance may fail to connect to its components.

3. Using SSH and an account with superuser privileges, log into the master management node.

Note

The data center IP address used in this procedure is an example.

```
# ssh root@10.100.1.101
```

[2] The factory-default global password is `Welcome1` .

```
root@10.100.1.101's password:
[root@ovcamn05r1 ~]#
```

4. Set a new Wallet entry for the corresponding component or user account.

```
# ovca-update-password -t <password_type>
```

Valid password types are: `nm2`, `xsigo`, `ilom`, `db`, `agent`, `ovca`, `mgmt`, `wallet`, `zfs`, `pdu`, `wls`, `system`, `opus`, `ovmm`, `xms`.

Note

Password changes through the Dashboard, which apply to all other system configuration components of Oracle Virtual Compute Appliance, are described in Section 2.4, “Network Setup”.

6.11 Using a Custom CA Certificate for SSL Encryption

By default, Oracle Virtual Compute Appliance and Oracle VM Manager use a self-signed SSL certificate. While it serves to provide SSL encryption for all HTTP traffic, it is recommended that you obtain and install your own custom trusted certificate from a well-known and recognized Certificate Authority (CA).

Both the Oracle Virtual Compute Appliance Dashboard and the Oracle VM Manager web interface run on Oracle WebLogic Server. Oracle WebLogic Server provides the functionality to update the digital certificate and keystore. To add your own trusted CA certificate and keystore, see the procedures set out in the Oracle WebLogic documentation:

- Configuring Keystores: http://docs.oracle.com/cd/E17904_01/apirefs.1111/e13952/taskhelp/security/ConfigureKeystoresAndSSL.html
- Configuring Identity and Trust: http://docs.oracle.com/cd/E23943_01/web.1111/e13707/identity_trust.htm

Caution

Each Oracle Virtual Compute Appliance management node runs its own instance of Oracle WebLogic Server. You must apply the same changes separately to the master and standby management node.

Accessing the Oracle WebLogic Server Administration Console

1. In your browser, enter the address `https://IP:7002/console` .

   In the address, *IP* refers to the IP address that you have configured for each of the management nodes during installation.

2. Log in with the user name `weblogic` and the global password. [1]

   If you have already changed the default password, enter the password you configured by following the instructions in Section 6.9, “Changing Oracle WebLogic Server Passwords”.

6.12 A Compute Node Fails to Complete Provisioning

Compute node provisioning is a complex orchestrated process involving various configuration and installation steps and several reboots. Due to connectivity fluctuations, timing issues or other unexpected events, a compute node may become stuck in an intermittent state or go into error status. The solution is to reprovision the compute node.

Warning

Reprovisioning is to be applied *only* to compute nodes that fail to complete provisioning.

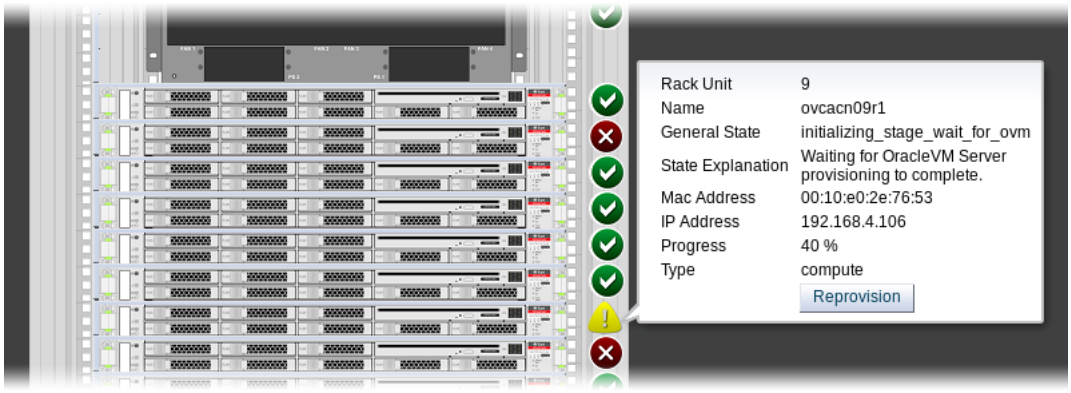
For correctly provisioned and running compute nodes, reprovisioning functionality is blocked in order to prevent incorrect use that could lock compute nodes out of the environment permanently or otherwise cause loss of functionality or data corruption.

Reprovisioning a Compute Node when Provisioning Fails

1. Log in to the Oracle Virtual Compute Appliance Dashboard.
2. Go to the **Hardware View** tab.
3. Roll over the compute nodes in Warning or Error status.

   A pop-up window displays a summary of configuration and status information.

   Figure 6.1 Compute Node Information and Reprovision Button in Hardware View



4. If the compute node provisioning is incomplete and the server is in error status or stuck in an intermittent state for several hours, click the **Reprovision** button in the pop-up window.
5. When the confirmation dialog box appears, click OK to start reprovisioning the compute node.

If compute node provisioning should fail after the server was added to the Oracle VM server pool, additional recovery steps could be required. The cleanup mechanism associated with reprovisioning may be unable to remove the compute node from the Oracle VM configuration. In this case you need to perform operations in Oracle VM Manager that are otherwise not permitted. You may also need to power on the compute node manually.

Removing a Compute Node from the Oracle VM Configuration

1. Log into the Oracle VM Manager user interface.

   For detailed instructions, see Section 3.2, “Logging in to the Oracle VM Manager Web UI”.

2. Go to the **Servers and VMs** tab and verify that the server pool named `Rack1_ServerPool` does indeed contain the compute node that fails to provision correctly.
3. If the compute node is locked due to a running job, abort it in the **Jobs** tab of Oracle VM Manager.

Detailed information about the use of jobs in Oracle VM can be found in the Oracle VM User's Guide. Refer to the sections entitled Jobs Tab and Working with the Jobs Framework.

4. Remove the compute node from the Oracle VM server pool.

   Refer to the Oracle VM User's Guide and follow the instructions in the section entitled Removing an Oracle VM Server from a Server Pool.

5. Delete the compute node from Oracle VM Manager.

   Refer to the Oracle VM User's Guide and follow the instructions in the section entitled Deleting Oracle VM Servers from Oracle VM Manager.

When the failing compute node has been removed from the Oracle VM configuration, return to the Oracle Virtual Compute Appliance Dashboard, to reprovision it. If the compute node is powered off and reprovisioning cannot be started, power on the server manually.

6.13 Oracle VM Server Pool Is Offline After Network Services Restart

When network services are restarted on the master management node, the connection to the Oracle VM management network (`bond0`) is lost. By design, the `bond0` interface is not brought up automatically on boot, so that the virtual IP of the management cluster can be configured on the correct node, depending on which management node assumes the master role. While the master management node is disconnected from the Oracle VM management network, the Oracle VM Manager user interface reports that the compute nodes in the server pool are offline.

The management node that becomes the master, runs the Oracle VM services necessary to bring up the `bond0` interface and configure the virtual IP within a few minutes. It is expected that the compute nodes in the Oracle VM server pool return to their normal online status in the Oracle VM Manager user interface. If the master management node does not reconnect automatically to the Oracle VM management network, bring the `bond0` interface up manually from the Oracle Linux shell.

Warning

Execute this procedure *ONLY* when so instructed by Oracle Support. This should only be necessary in rare situations where the master management node fails to connect automatically. You should never manually disconnect or restart networking on any node.

Manually Reconnecting the Master Management Node to the Oracle VM Management Network

1. Using SSH and an account with superuser privileges, log into the disconnected master management node on the appliance management network.

```
# ssh root@192.168.4.3
root@192.168.4.3's password:
[root@ovcamn05r1 ~]#
```

2. Check the configuration of the `bond0` interface.

   If the interface is down, the console output looks similar to this:

```
# ifconfig bond0
bond0     Link encap:Ethernet  HWaddr 00:13:97:4E:B0:02
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
```

```
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

3. Bring the `bond0` interface up.

```
# ifconfig bond0 up
```

4. Check the configuration of the `bond0` interface again.

   When the interface reconnects successfully to the Oracle VM management network, the console output looks similar to this:

```
# ifconfig bond0
bond0     Link encap:Ethernet  HWaddr 00:13:97:4E:B0:02
          inet addr:192.168.140.4  Bcast:192.168.140.255  Mask:255.255.255.0
          inet6 addr: fe80::213:97ff:fe4e:b002/64 Scope:Link
          UP BROADCAST RUNNING MASTER MULTICAST  MTU:1500  Metric:1
          RX packets:62191 errors:0 dropped:0 overruns:0 frame:0
          TX packets:9183 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:4539474 (4.33 MB)  TX bytes:1853641 (1.77 MB)
```

Appendix A Licenses

Table of Contents

This appendix contains license information applicable to Oracle Virtual Compute Appliance and its hardware and software components.

A.1 Oracle Virtual Compute Appliance Controller Software

Document Part Number: 7082362

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Last updated 22 August 2013

Oracle Virtual Compute Appliance

A.2 Oracle Linux

Document Part Number: 7082365

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Last updated 22 August 2013

A.3 Oracle Hardware with Pre-Installed Oracle VM Server

Document Part Number: 7082364

Software License Agreement for Oracle Hardware with Pre-Installed Oracle VM Server

This Agreement includes license terms for certain software products that may be installed on the Oracle hardware you have acquired. The Oracle VM Server program launched when you powered the machine or is pre-installed on the machine. As you proceed through the installation or set-up process you will have the option to deploy one or more of the virtual machine images that are pre-installed on the machine. By deploying any of these virtual machine images, you acknowledge that your use of the Oracle VM Server program and any included software programs referenced below are subject to the terms of this Agreement.

Section A: Terms for Oracle VM Server

Section B: Terms for Oracle VM Manager

Section C: Terms for Oracle Solaris

Section D: Terms for Oracle Linux

This Agreement is governed by the substantive and procedural laws of the United States and the State of California and you and Oracle agree to submit to the exclusive jurisdiction of, and venue in, the courts

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Last updated: 30 August 2013

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A.4.2 Java Runtime Environment

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A.4.4 Pexpect

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A.4.5 Oracle Fabric Manager

Oracle Fabric Manager is included with Oracle Virtual Compute Appliance.

License information is available at the following location:

http://docs.oracle.com/cd/E38500_01/pdf/E50996.pdf

A.4.6 Oracle VM

Oracle VM is included with Oracle Virtual Compute Appliance.

License information is available at the following location:

http://docs.oracle.com/cd/E35328_01/E35332/html/vmusg-licenses.html

A.5 License Information for Hardware Components

The following list provides access to license information for each hardware component.

- Oracle Fabric Interconnect F1-15 Director Switch:

  URL: http://docs.oracle.com/cd/E38500_01/index.html

- Oracle Switch ES1-24:

URL: http://docs.oracle.com/cd/E39109_01/html/E39115/index.html

- NM2-36P Sun Datacenter InfiniBand Expansion Switch:

  URL: http://docs.oracle.com/cd/E26698_01/html/E23541/index.html

- Sun Server X4-2

  URL: http://docs.oracle.com/cd/E36975_01/html/E38044/index.html

- Sun Server X3-2

  URL: http://docs.oracle.com/cd/E22368_01/html/E28850/index.html

- Oracle ZFS Storage Appliance ZS3-ES:

  URL: http://docs.oracle.com/cd/E37831_01/pdf/E48363.pdf

  URL: http://docs.oracle.com/cd/E27998_01/pdf/E48302.pdf

- Sun ZFS Storage Appliance 7320:

  URL: http://docs.oracle.com/cd/E26765_01/html/E26047/index.html

Index

T

U

V

W

Z