Oracle® Private Cloud Appliance

Release Notes for Release 2.2.1

ORACLE

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Preface

This document is part of the documentation library for Oracle Private Cloud Appliance (PCA) Release 2.2, which is available at:

http://docs.oracle.com/cd/E71897_01.

The documentation library consists of the following items:

Oracle Private Cloud Appliance Release Notes

The release notes provide a summary of the new features, changes, fixed bugs and known issues in Oracle PCA.

Oracle Private Cloud Appliance Licensing Information User Manual

The licensing information user manual provides information about the various product licenses applicable to the use of Oracle PCA.

Oracle Private Cloud Appliance Installation Guide

The installation guide provides detailed instructions to prepare the installation site and install Oracle PCA. It also includes the procedures to install additional compute nodes, and to connect and configure external storage components.

Oracle Private Cloud Appliance Safety and Compliance Guide

The safety and compliance guide is a supplemental guide to the safety aspects of Oracle PCA. It conforms to Compliance Model No. OCA1A.

Oracle Private Cloud 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 PCA.

Oracle Private Cloud Appliance Quick Start Poster

The quick start poster provides a step-by-step description of the hardware installation and initial software configuration of Oracle PCA. A printed quick start poster is shipped with each Oracle PCA 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 Private Cloud Appliance Expansion Node Setup Poster

The expansion node setup poster provides a step-by-step description of the installation procedure for an Oracle PCA expansion node. A printed expansion node setup poster is shipped with each Oracle PCA 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 Private Cloud Appliance (PCA) documentation is written for technicians, authorized service providers, data center operators and system administrators who want to install, configure and maintain a

private cloud 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 PCA 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 PCA 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 PCA determines the requirements of your administrative knowledge.

Related Documentation

Additional Oracle components may be included with Oracle PCA depending on configuration. The documentation for such additional components is available as follows:

- Sun Rack II 1042 and 1242

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

- Oracle Server X6-2

  http://docs.oracle.com/cd/E62159_01/index.html

- Oracle Server X5-2

  http://docs.oracle.com/cd/E41059_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/E37831_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/E36265_01/index.html

- Oracle Fabric Interconnect F1-15

  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

- Oracle Enterprise Manager Plug-in

  http://docs.oracle.com/cd/E63000_01/EMPCA/toc.htm

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

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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 About Oracle Private Cloud Appliance

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This chapter provides a quick overview of the product and its components.

1.1 Introduction

Oracle Private Cloud Appliance (PCA) is an Oracle Engineered System designed for virtualization. It 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. Compute resources, network hardware, storage providers, operating systems and applications are engineered to work together but are managed and operated as a single unit.

Installation, configuration, high availability, expansion and upgrading are automated and orchestrated as much as possible. 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. Within approximately one hour 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).

The primary value proposition of Oracle PCA 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 Components

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

> **Note**
>
> Oracle Private Cloud Appliance base racks are factory installed with the latest supported generation of server nodes. Earlier generations of the Oracle PCA server architecture continue to be supported by the Oracle PCA controller software. If additional nodes have been installed, or if nodes have been replaced, an Oracle PCA rack can be populated with a mix of supported servers. Besides the marginal performance increase offered by a newer server architecture, there is no functional difference between the server generations within the Oracle PCA environment.
>
> Currently supported server architectures are:
>
> • Oracle Server X6-2: software release 2.2.1 (compute node only)
>
> • Oracle Server X5-2: software release 2.0.3 or newer

- Sun Server X4-2: software release 1.1.3 or newer

- Sun Server X3-2: since initial release

When you order expansion compute nodes, you receive the latest available generation.

The Oracle PCA Controller Software must be upgraded to the correct version to support the hardware installed in your environment.

Note

The initial version of the Oracle Private Cloud Appliance, the X3-2 base rack, was shipped with the Sun ZFS Storage Appliance 7320. This hardware component has since been replaced with the Oracle ZFS Storage Appliance ZS3-ES. Software support for the Oracle ZFS Storage Appliance ZS3-ES is available as of Release 1.1.3. All software releases continue to support the Sun ZFS Storage Appliance 7320.

Figure 1.1 Components of an Oracle Private Cloud Appliance Rack
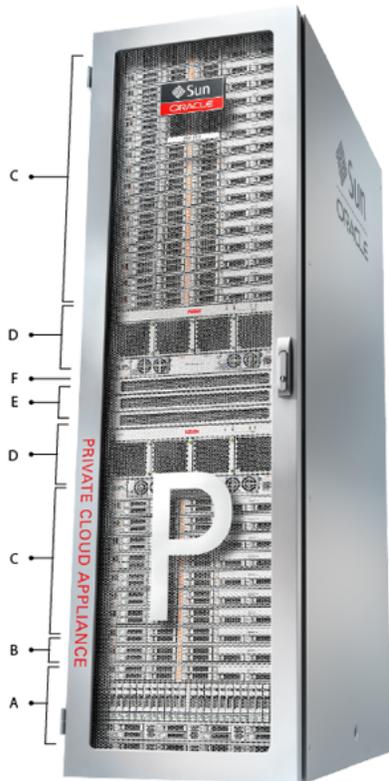
Table 1.1 Figure Legend

Item	Quantity	Description
A	1	Either Oracle ZFS Storage Appliance ZS3-ES or Sun ZFS Storage Appliance 7320
B	2	Either Oracle Server X5-2, Sun Server X4-2, or Sun Server X3-2, used as management nodes

Item	Quantity	Description
C	2-25	Either Oracle Server X6-2, Oracle Server X5-2, Sun Server X4-2, or Sun Server X3-2, used as virtualization compute nodes (Due to the higher power requirements of the Oracle Server X6-2 and Oracle Server X5-2, if the appliance is equipped with 22kVA PDUs, the maximum number of compute nodes is 23.)
D	2	Oracle Fabric Interconnect F1-15
E	2	NM2-36P Sun Datacenter InfiniBand Expansion Switch
F	2	Oracle Switch ES1-24

At the software level, Oracle PCA leverages the virtualization technology of Oracle VM and Oracle Virtual Networking. Management, including updates, of the underlying hardware and software is orchestrated and largely automated by the Oracle PCA controller software.

Chapter 2 Feature Overview

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This chapter provides an overview of the key features in each release of Oracle Private Cloud Appliance (PCA).

2.1 Changes and Improvements in Release 2.2.1

This section describes functional changes, improvements and bug fixes compared to the previous release.

Support for Next-Generation Server Hardware

Oracle PCA Release 2.2.1 software adds provisioning and orchestration support for Oracle Server X6-2 expansion compute nodes. These offer practically the same functionality and performance as their predecessors, but with more up-to-date internal components.

> **Note**
>
> Release 2.2.1 adds support for Oracle Server X6-2 expansion compute nodes only. The use of this generation of servers as management nodes is not supported with this software release.

Oracle Server X6-2 expansion nodes can be installed in base racks of a previous release, provided the software stack is updated to Release 2.2.1 or a future release. Oracle Server X6-2, Oracle Server X5-2, Sun Server X4-2 and Sun Server X3-2 compute nodes can be used within the same rack in the same Oracle VM server pool. The only functional implication is that virtual machines cannot be live-migrated between the different server types because they belong to separate CPU compatibility groups. In that situation, a virtual machine would need to be shut down on one server and restarted on the other server.

Tenant Groups

A *tenant group* is a logical subset of a single Oracle PCA environment. Tenant groups provide an optional mechanism for an Oracle PCA administrator to subdivide the environment in arbitrary ways for manageability and isolation. The tenant group offers a means to isolate compute, network and storage resources per customer. As of release 2.2.1, or during a controller software update to release 2.2.1, the traditional *Rack1_ServerPool* becomes the default tenant group. Oracle PCA supports a maximum of 8 tenant groups, including the default one, which cannot be deleted.

The tenant group functionality can be accessed through the CLI. With a specific set of commands you manage the tenant groups, their member compute nodes, and the associated custom networks. The

CLI initiates a number of Oracle VM operations to set up the server pool, and a synchronization service maintains settings across the members of the tenant group.

The tenant group is practically synonymous with its associated Oracle VM server pool. The additional appliance-level functionality lies in the automatic configuration of networking across the members of the tenant group or server pool. This is why **tenant groups must be managed through the Oracle PCA CLI**, not through Oracle VM Manager.

Performance Enhancements

This release of the Oracle PCA software contains a significant number of improvements aimed at better overall performance. Areas where significant progress was made, include: compute node provisioning, upgrade procedures, network and storage management, virtual machine network throughput and migration time, and general Oracle VM operation.

The enhancements translate not only to faster configuration and deployment, but also – more importantly – to a more reliable product and better scalability of the Oracle PCA environment.

Host Networks

Custom networking functionality has been expanded with a new option: the host network. A host network is a particular type of custom external network: its configuration contains a definition of a subnet, in which the participating compute nodes have an IP address. This allows compute nodes to connect to an external network device. Optionally, additional parameters are added for specific routing. The host network is particularly useful for direct access to storage devices.

Expansion Racks

The Oracle PCA Release 2.2.1 controller software supports expansion racks. However, the installation of additional racks cannot be automated and requires several manual reconfigurations of rack infrastructure components by a qualified Oracle specialist. Consequently a multi-rack Oracle PCA installation is considered a consulting project. Contact your Oracle representative for more information.

Bugs Fixed in Release 2.2.1

The following table lists bugs that have been fixed in Oracle PCA Release 2.2.1.

Table 2.1 List of Fixed Bugs

Bug ID	Description
22725771	"Controller Software Update Fails on Multipath Check"
	This failure was caused by an attempt to mount a YUM directory that was already mounted. The multipath check script that failed, resides in that directory.
	The code now verifies the mount point first to eliminate the error. In addition, the pexpect timeout has been increased to ensure that the script can finish its tasks in larger environments.
21790700	"Multipath Configuration Changes in Software Update Cause Failures"
	With Release 2.0.5 the installation of new packages removed the ZFS-specific stanza from the `multipath.conf` file. This caused multipath failures on compute nodes and made VM file systems read-only.

Bug ID	Description
	The upgraded packages that caused this problem have been fixed so that an update of the Oracle PCA Controller Software now maintains the ZFS-specific multipath configuration entries.
22311868	"PCA Restricted to One Server Pool"
	Customer defined Tenant Groups have been implemented in Release 2.2.1. These provide the functionality of custom Oracle VM server pools, with additional appliance-level configuration options.
22657376	"Controller Software Update Fails Due to Unexpected ZFS Head Cluster State"
	The software update code now contains more accurate checks for the ZFS storage appliance cluster. If it is not in the required state, the update stops immediately and the administrator is instructed to manually reboot the backup storage head. This brings the cluster back to the expected state.
22900716	"Compute Node and Management Node ILOMs Require Security Patch"
	A security patch for ILOM was released to address the OpenSSL vulnerability CVE-2016-0800. New firmwares for all supported server platforms are now included in the Oracle PCA ISO image.
23188628	"Unable to Change Passwords Due to Sync Task Errors"
	Failures occurred when trying to set a new password for Oracle VM Manager, WebLogic and MySQL. To fix this issue, the management node virtual IP address was added as a destination in the synchronization service.
23192377	"HCA Firmware Update Required for ZFS Storage Appliance"
	A firmware update is available for the type CX-2 InfiniBand HCA installed in the Oracle ZFS Storage Appliance ZS3-ES. This firmware update (2.11.2010) addresses the known port flapping issue, and is now included in the Oracle PCA ISO image.
21114405	"Configuration Restore Incomplete after Oracle Switch ES1-24 Firmware Upgrade"
	The Oracle PCA ISO image now includes firmware version 1.3.1.15, which resolves the earlier issue with missing tacacs+ alternate servers and port numbers. With the new firmware, the switch configuration can be completely restored in a single operation.

2.2 Changes and Improvements in Release 2.1.1

This section describes functional changes, improvements and bug fixes compared to the previous release.

Appliance Network Customization

The Oracle PCA controller software allows you to add custom networks at the appliance level. This means that the Fabric Interconnects and other hardware components are reconfigured to enable the additional connectivity. These networks are then configured automatically in your Oracle VM environment, where they can be used for isolating and optimizing network traffic beyond the capabilities of the default network configuration.

All custom networks, both internal and public, are VLAN-enabled. For networks with external connectivity the Fabric Interconnect I/O ports must be specified so that these are reconfigured to route the external

traffic. These ports must be cabled to create the physical uplink to the next-level switches in the data center.

Creating custom networks requires use of the CLI.

Monitoring Service

The Oracle PCA controller software contains a monitoring service, which is started and stopped with the `ovca` service on the active management node. It allows an administrator to verify the current health status at any time.

An inventory database is populated with information about the various components installed in the rack, including the IP addresses to be used for monitoring. With this information, the ping manager pings all known components every 3 minutes and updates the inventory database. When errors occur they are logged in the monitor database.

CLI Consolidation

As the Oracle PCA software matures, the original management scripts are gradually consolidated in the Oracle PCA Command Line Interface. In Release 2.1.1 the controller software update and password management functionality has been integrated entirely into the CLI.

Improved Authentication Management

A finer-grained and more robust password management functionality has been implemented. It is exposed in a uniform way through both the Oracle PCA Dashboard browser interface and the CLI.

Component Firmware Upgrades

As part of the Oracle PCA software update, the firmware of the ZFS Storage Appliance is upgraded automatically. The firmware upgrades enable a number of new functions that are required by the latest appliance management software. At the same time the storage head cluster is reconfigured so that both controllers have an IP address in the appliance management network. This makes the storage hardware easier to service and maintain.

In case you need to upgrade the firmware of other appliance components, you must manually install the version provided as part of the Oracle PCA `*.iso` image.

The reconfiguration of the ZFS storage appliance networking begins when the standby management node is upgraded. The process adds approximately 90 minutes to the standard software update. During the firmware upgrade of the ZFS storage appliance some virtual machines may become read-only temporarily as a consequence of storage head failovers. Once the storage head cluster configuration has been updated the software update of the second management node will take much less time.

Flexible Memory Configurations

The installation of additional physical RAM is now supported. Different memory kits are available for the different generations of server hardware that may be installed in an Oracle PCA environment. The Oracle Server X5-2 has 16 free DIMM slots that may be filled with 8 or 16 additional RAM modules for a maximum total of 768GB per server.

The Oracle PCA Release 2.1.1 software detects the new RAM modules during reboot and makes the appropriate configuration changes automatically.

Oracle VM Upgrade

Oracle VM Manager and Oracle VM Server have been upgraded to Release 3.2.10, to include the latest security and errata bug fixes available.

Bugs Fixed in Release 2.1.1

The following table lists bugs that have been fixed in Oracle PCA Release 2.1.1.

Table 2.2 List of Fixed Bugs

Bug ID	Description
21208797	"Large Number of vHBA Error Messages Causes Failure of Both Management Nodes"
	The multipath configuration and udev rules have been modified to prevent these storage-related failures from occurring.
19667855	"The CLI Command `diagnose software` Fails to Correctly Run Some Diagnostic Tests"
	A known issue with missing ssh keys caused some diagnostic tests to fail. This issue has been resolved and no more workarounds are required to run the diagnostic command.
not specified	As a result of repairs, disk replacements or recovery operations, the ZFS storage undergoes a data integrity protection and error correction process known as *resilvering*. Certain scrub and resilvering statuses would inadvertently prevent the automated firmware upgrade of the ZFS Storage Appliance. This, in turn, causes the entire Oracle Private Cloud Appliance software update to fail.
	Corrections in the upgrade code now ensure that the update to Release 2.1.1 completes as expected.

2.3 Changes and Improvements in Release 2.0.5

Oracle PCA Release 2.0.5 is an errata release. This section describes functional changes, improvements and bug fixes compared to the previous release.

New Product Name

Release 2.0.5 marks the launch of a new name for Oracle's Engineered System designed for cloud computing. From now on, the Oracle Virtual Compute Appliance (VCA) is known as the **Oracle Private Cloud Appliance (PCA)**. The new name was chosen to better reflect the product's focus on private, on-premise cloud environments. Oracle PCA is built on the same software technology that powers Oracle's public cloud infrastructure.

The Oracle PCA Dashboard, Command Line Interface and appliance management scripts have been updated in accordance with the name change.

Oracle VM Upgrade

Oracle VM Manager and Oracle VM Server have been upgraded to Release 3.2.9, to include the latest security and errata bug fixes available.

Bugs Fixed in Release 2.0.5

No critical field fixes have been identified for Release 2.0.5 of the Oracle PCA software.

2.4 Changes and Improvements in Release 2.0.4

Oracle PCA Release 2.0.4 is an errata release. This section describes functional changes, improvements and bug fixes compared to the previous release.

Compute Node Provisioning

Release 2.0.4 is a mandatory update of the Release 2.0.3 software stack installed on X5-2 base racks during manufacturing. It enables the provisioning of compute nodes once the appliance is installed and updated on-site. This release specifically applies a newer UEK2 kernel that eliminates a number of bugs and vulnerabilities.

Kernel Upgrade

The Oracle PCA Release 2.0.4 software upgrades the UEK2-400 kernel on all servers. The new kernel contains important bug fixes to improve stability and compatibility, and eliminates a number of vulnerabilities.

The exact kernel versions are:

- management nodes: `kernel-uek-2.6.39-400.249.3.el6uek.x86_64`

- compute nodes: `kernel-uek-2.6.39-400.249.3.el5uek`

Bugs Fixed in Release 2.0.4

No critical field fixes have been identified for Release 2.0.4 of the Oracle PCA software. However, the UEK2 kernel upgrade adds significant improvements at the server operating system level.

2.5 Changes and Improvements in Release 2.0.3

Oracle PCA Release 2.0.3 is an errata release. This section describes functional changes, improvements and bug fixes compared to the previous release.

Support for the X5-2 Base Rack

The term *base rack* refers to the minimum orderable Oracle PCA configuration, as described in Section 1.2, "Components". Oracle PCA Release 2.0.3 software adds provisioning and orchestration support for Oracle Server X5-2 management nodes and compute nodes, which are installed in the X5-2 base rack at the factory. The Oracle Server X5-2 offers practically the same functionality and performance as its predecessors, but with more up-to-date internal components.

> **Warning**
>
> In Oracle PCA base racks that are factory-installed with Oracle PCA Release 2.0.3 software, provisioning functionality is locked by default. You must download and install Oracle PCA Release 2.0.4 software to remove the lock and initialize the provisioning process.

Optional Fibre Channel Connectivity

The X5-2 base rack with Oracle PCA Release 2.0.3 software marks the first configuration that can be ordered with or without fibre channel I/O modules. If you order an Oracle PCA without fibre channel connectivity, slots 3 and 12 of the Fabric Interconnects will be empty. As a consequence, Software Clouds and vHBAs, which are normally associated with the appliance fibre channel connectivity, are not created during the provisioning of the rack components.

> **Caution**
>
> If you chose to omit fibre channel from your original Oracle PCA configuration, and you purchase and install the fibre channel I/O modules at a later time, an upgrade of the controller software to Release 2.1.1 is required. Previous releases of the software do not allow you to configure the Software Clouds and vHBAs in an already provisioned appliance.

New Operating System and Kernel

With Release 2.0.3 of the Oracle PCA software the management node operating system is upgraded to Oracle Linux Release 6 Update 6 with a new UEK2-400 kernel.

Bugs Fixed in Release 2.0.3

No critical field fixes have been identified for Release 2.0.3 of the Oracle PCA software.

2.6 Changes and Improvements in Release 2.0.2

Oracle PCA Release 2.0.2 is an errata release. This section describes functional changes, improvements and bug fixes compared to the previous release.

Support for Next-Generation Server Hardware

Oracle PCA Release 2.0.2 software adds provisioning and orchestration support for Oracle Server X5-2 expansion compute nodes. These offer practically the same functionality and performance as their predecessors, but with more up-to-date internal components.

> **Note**
>
> Release 2.0.2 adds support for Oracle Server X5-2 expansion compute nodes only. The use of this generation of servers as management nodes is not supported with this software release.

Oracle Server X5-2 expansion nodes can be installed in base racks of a previous release, provided the software stack is updated to Release 2.0.2 or a future release. Oracle Server X5-2, Sun Server X4-2 and Sun Server X3-2 compute nodes can be used within the same rack in the same Oracle VM server pool. The only functional implication is that virtual machines cannot be live-migrated between the different server types because they belong to separate CPU compatibility groups. In that situation, a virtual machine would need to be shut down on one server and restarted on the other server.

Updated Component Firmware

Oracle PCA Release 2.0.2 software contains the latest supported firmware for all the hardware components in the appliance. These are identical to what is currently installed on new systems leaving the factory, allowing you to take advantage of bugfixes and functional improvements to the hardware you already own.

> ⚠️ **Caution**
>
> If you own a base rack containing the Sun ZFS Storage Appliance 7320, please read this first: Section 4.1.4, "Sun ZFS Storage Appliance 7320 Firmware Upgrade Must Be Performed After Management Node Update to Release 2.0.2"

Bugs Fixed in Release 2.0.2

The following table lists bugs that have been fixed in Oracle PCA Release 2.0.2.

Table 2.3 List of Fixed Bugs

Bug ID	Description
20319331	"Compute Node Proxy Settings Are Lost During Server Upgrade in Oracle VM Manager"
	When running a Yum upgrade on compute nodes from within Oracle VM Manager, custom proxy settings – added during kickstart for example – would be overwritten with default values. The Oracle PCA upgrade code now detects and preserves existing http(s) and ftp proxy settings.
20434987	"Creation of Large Number of Networks Fails with Buffer Overflow"
	When a large number of new networks was created in Oracle VM Manager, a buffer overflow could occur, causing the list of networks to become truncated during provisioning. This resulted in lookup errors, duplicate networks and other complications. Changes in the way network list commands are processed now ensure that the buffer overflow no longer occurs. The Oracle VM installation time-out has been increased to 50 minutes to allow for the provisioning of a large number of custom networks.
20514232	"Re-adding Disconnected Compute Node to Server Pool Results in Reboot of Other Nodes"
	To mitigate the risk of compute nodes crashing and rebooting, often coinciding with server pool cluster errors, Oracle PCA Release 2.0.2 adds a new Oracle Linux UEK2-400 kernel. It includes patches for the issues observed in Oracle PCA systems, along with various other improvements.
20319302	"Release 2.0.2 Must Contain Component Firmwares with Bash Bug Fix"
	The Release 2.0.2 software stack contains updated firmwares for hardware components, which eliminate the Bash-related vulnerabilities. With the Release 2.0.2 ISO, tested and approved firmware updates are available for the following components: ZFS Storage Appliance, InfiniBand switches, ES1-24 Ethernet switches, Sun Server X4-2 ILOMs and Fabric Interconnects.

2.7 Changes and Improvements in Release 2.0.1

This section describes functional changes, improvements and bug fixes compared to the previous release.

External Storage Support

As of this release, Oracle PCA storage can be extended by connecting and configuring external storage hardware. This allows customers to provision virtual machines with virtual disks beyond the capacity of

the internal storage, and to provide ample disk space for large repositories and for backup and recovery purposes. The storage hardware is connected to the Fabric Interconnects using either InfiniBand or Fibre Channel technology.

For additional information and instructions to extend Oracle PCA storage, refer to the chapter Extending Oracle Private Cloud Appliance - External Storage in the Oracle Private Cloud Appliance Installation Guide.

Integrated Command Line Interface

Oracle PCA command line utilities are now consolidated into a single command line interface (CLI), which is accessible from the Oracle Linux shell on the management node. The CLI provides both single-command and interactive access to all of the tools available in the Oracle PCA Dashboard, as well as many other functions that have no UI equivalent. The design of the CLI makes it possible to script actions that may need to be performed on a regular basis, or to write integration scripts for existing monitoring and maintenance software not directly hosted on the appliance.

For details about CLI usage and an overview of the available commands and their options, refer to the chapter The Oracle Private Cloud Appliance Command Line Interface (CLI) in the Oracle Private Cloud Appliance Administrator's Guide.

VLAN-Enabled Appliance Management Network

The appliance management network now supports the use of VLANs. The IPs you assign to the management node cluster may belong to a VLAN in use at the customer data center. To configure the appliance accordingly, select the VLAN in the Dashboard. The network interfaces of the management nodes are configured to accept VLAN tags.

Synchronization Service

A synchronization service has been implemented to allow configurable parameters to be set and maintained across heterogeneous sets of components within an Oracle PCA environment. Throughout the life cycle of the appliance, software updates, capacity extensions and configuration changes will occur at different points in time. The synchronization service is an extensible foundation for any mechanism implemented to eliminate configuration mismatches.

Provisioning Lock

The Oracle PCA Dashboard allows administrators to temporarily disable compute node provisioning with the click of a button. When provisioning is suspended, maintenance tasks or management node upgrades can be carried out safely.

Bugs Fixed in Release 2.0.1

The following table lists bugs that have been fixed in Oracle PCA Release 2.0.1.

Table 2.4 List of Fixed Bugs

Bug ID	Description
17431002	"Restarting Oracle PCA Service Causes Compute Node Provisioning to Fail"
	A new mechanism has been implemented to query the internal DHCP database for the availability of IP addresses for a new compute node and its corresponding ILOM.

Bug ID	Description
	If the Oracle PCA service is stopped, for example with a management node failover, during the provisioning of a compute node, an IP address may have been assigned to an unprovisioned server, and becomes unavailable for future use. Because the appliance provisioning software expects the ILOM to obtain an IP in the same subnet as the compute node, with a value +100 (IPv4 decimal notation) for the final byte, the new DHCP query looks for matching available IPs before assigning them, thereby eliminating the risk of provisioning failing due to mismatches or unavailable IPs. It is still recommended to lock provisioning of new compute nodes during planned failovers such as management node upgrades.
18435883	"Running `pca-node-db delete` Without Options Deletes All Node Entries from Database" It is no longer possible to delete the contents of the node database this way.
18967069	"Management Node Cluster Configuration Fails During Software Update" During appliance management software upgrade, when the secondary management node takes over the master role, it requires connectivity to the internal storage appliance. New checks now ensure that there is a route to the storage appliance before the software update continues. As a result, the update process will no longer hang because the `ovca` service is not started when the master role is transferred between management nodes.

2.8 Changes and Improvements in Release 1.1.3

Oracle PCA Release 1.1.3 is a maintenance release. This section describes functional changes, improvements and bug fixes compared to the previous release.

OpenSSL Security Upgrade

Release 1.1.3 is an errata release that eliminates the OpenSSL security issue CVE-2014-0160 – commonly known as the 'heartbleed bug'. This release of the Oracle PCA software contains an upgraded OpenSSL package that is not affected by the vulnerability in question.

Oracle has published an article on Oracle Technology Network to document the current status of its products with respect to OpenSSL security: http://www.oracle.com/technetwork/topics/security/opensslheartbleedcve-2014-0160-2188454.html

Bugs Fixed in Release 1.1.3

The following table lists bugs that have been fixed in Oracle PCA Release 1.1.3.

Table 2.5 List of Fixed Bugs

Bug ID	Description
18553479	"OpenSSL 'Heartbleed' Vulnerability Affects Management Nodes" The patched version of OpenSSL is included in the errata Release 1.1.3 of the Oracle PCA software stack. An upgrade to Release 1.1.3 eliminates the 'heartbleed' vulnerability.

Bug ID	Description
18545030	"OpenSSL upgrade required in Oracle PCA code base" All builds of the Oracle PCA software Release 1.1.3 and later include a version of the OpenSSL package that is not compromised by the 'heartbleed' vulnerability.

2.9 Changes and Improvements in Release 1.1.1

This section describes functional changes, improvements and bug fixes compared to the previous release.

Support for Next-Generation Hardware

Oracle PCA Release 1.1.1 software adds provisioning and orchestration support for Sun Server X4-2 nodes and the Oracle ZFS Storage Appliance ZS3-ES. Both are standard components in new Release 1.1.1 systems and offer practically the same functionality and performance as their predecessors, but with more up-to-date internal components such as faster CPUs and slightly larger system disks. The new storage appliance uses the exact same disk shelf as the previous model, thus offering the same amount of usable space.

Sun Server X4-2 expansion nodes can be installed in Release 1.0.x base racks, provided the software stack is updated to Release 1.1.1 or a future release. Sun Server X4-2 and Sun Server X3-2 compute nodes can be used within the same rack in the same Oracle VM server pool. The only functional implication is that virtual machines cannot be live-migrated between both server types because they belong to separate CPU compatibility groups. In that situation, a virtual machine would need to be shut down on one server and restarted on the other server.

Oracle Auto Service Request

Oracle PCA 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.x software image but they must be installed and configured in order to enable ASR for your appliance.

> **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.

Details about the installation, configuration and usage of ASR can be found in the chapter Automating Oracle Private Cloud Appliance Service Requests of the Oracle Private Cloud Appliance Administrator's Guide.

Improved Diagnostics

The collection of diagnostic data for troubleshooting has been improved significantly in the Oracle PCA Release 1.1.1 software. Dedicated command line tools are now installed on the management and compute nodes. They collect specific Oracle PCA logs and related files, or Oracle VM troubleshooting data, depending on the selected command line arguments. The health status of each server, its configuration and its main components can be retrieved through the ILOM.

The new diagnostic functionality offers customers and field service engineers the same level of troubleshooting capability and serviceability as with other Oracle Engineered Systems. Details about the

new diagnostic tools can be found in the section Oracle Private Cloud Appliance Diagnostics Tool of the Oracle Private Cloud Appliance Administrator's Guide.

Bugs Fixed in Release 1.1.1

The following table lists bugs that have been fixed in Oracle PCA Release 1.1.1.

Table 2.6 List of Fixed Bugs

Bug ID	Description
17895011	"Backup to storage appliance fails because too many old backups exist" A new mechanism is in place to delete stale, unused backup data after it is exported successfully. It is no longer required to manually clean up the backups on the ZFS storage appliance.
17607389	"Network View tab partially displayed in Internet Explorer" Display issues with the Oracle PCA Dashboard in Internet Explorer 8 and 9 have been resolved.
17192103	"Compute node falls through PXE boot and cannot be provisioned" The Reprovision button in the Dashboard was implemented to recover compute nodes that failed during provisioning. Further enhancements to the reprovisioning functionality now help detect compute nodes in error state and automatically clean up their configuration. Reprovisioning has been made unavailable for correctly provisioned, running compute nodes.
17389234	"Compute node installed but provisioning failed; network not set correctly" The reprovisioning functionality has an improved mechanism to detect the point at which provisioning failed. As a result, it can clean up the compute node configuration in Oracle VM and allow the provisioning to start over. Reprovisioning has been made unavailable for correctly provisioned, running compute nodes.
17430135	"Reprovision button does not work after compute node is discovered in Oracle VM" The reprovisioning functionality can detect compute nodes in error state and automatically clean up their configuration in Oracle VM. Manual clean-up in Oracle VM should no longer be required. Reprovisioning has been made unavailable for correctly provisioned, running compute nodes.

2.10 Changes and Improvements in Release 1.0.2

Oracle PCA Release 1.0.2 is a maintenance release. This section describes functional changes, improvements and bug fixes compared to the previous release.

Compute Node Provisioning

Release 1.0.2 is a mandatory update of the Release 1.0.1 software stack installed during manufacturing. It enables the provisioning of compute nodes once the appliance is installed and updated on-site. A number of enhancements and bug fixes add more robustness and better serviceability of the functionality offered in this release.

Bugs Fixed in Release 1.0.2

The following table lists bugs that have been fixed in Oracle PCA Release 1.0.2.

Table 2.7 List of Fixed Bugs

Bug ID	Description
17704931	"Dashboard does not support simultaneous users" Multiple users can now log in to the Dashboard UI simultaneously without issues.
17703144	"Appliance is connected to data center network but external connectivity fails" Both tagged and untagged VLAN traffic is supported for virtual machine networking. Next-level data center switches must be configured accordingly, as described in the section Configuring Data Center Switches for VLAN Traffic of the Oracle Private Cloud Appliance Administrator's Guide. VLAN traffic is not supported for management node external networking.
17626460	"DNS configuration cannot be modified due to field validation error" Field validation has been corrected. DNS entries can be removed from the user-configurable network settings in the Dashboard UI.
17542460	"Inconsistent password change behavior in Dashboard" Password changes through the Dashboard UI are applied as designed in a reliable and consistent way.
17535669	"Dashboard login screen reports no error for invalid credentials" Error messages are displayed when a user attempts to log in with an incorrect user name or password.
17475229	"Network configuration update is not applied; Dashboard UI provides no feedback" User-configurable network settings are applied as designed in a reliable and consistent way. The Dashboard UI does not reload until the services affected by the configuration changes have restarted.
17457001	"Applying the dummy network configuration from the Quick Start Poster breaks rack connectivity" IP addresses are verified before they are applied. Internally used subnets and reserved addresses are rejected.
17449881	"Choosing Network in Network View causes Java exception" The exception – which had no adverse effects – no longer appears.
17415171	"Virtual machines are assigned to compute nodes in initializing state" Oracle VM does not allow compute nodes to join the server pool before they are completely provisioned and ready to use. If a compute node fails after joining the server pool, Oracle VM is unaware of the failure. This is considered normal behavior and is not harmful to the physical or virtual environment. If the issue is not resolved automatically by Oracle VM and the virtual machine will not start, you can log into Oracle VM Manager and move or migrate the virtual machine to a correctly operating compute node.
17360826	"Updating network configuration fails due to field validation error" Field validation has been corrected for all user-configurable network settings in the Dashboard UI.

Bug ID	Description
17347317	"Backup functionality unavailable in Dashboard" The Backup tab has been removed from the Dashboard UI. Built-in backup functionality is based on a cron job. For more information about backing up your data and recovering after a component failure, user error or full system failure, refer to the Oracle technical white paper entitled *Oracle Private Cloud Appliance Backup and Recovery Guide*.
17345384	"Restarting management node network service causes Oracle VM server pool to go offline" Manual intervention to restart networking on *any* node is only necessary in rare situations. This is documented in the section Oracle VM Server Pool Is Offline After Network Services Restart of the Oracle Private Cloud Appliance Administrator's Guide
17315730	"Oracle PCA Dashboard unavailable when logged in to Oracle VM Manager" The order in which you log in to both user interfaces no longer affects their availability. Both may be used side by side.

2.11 Key Features in Release 1.0.1

This section describes the key features offered in Release 1.0.1 of Oracle PCA.

Speed and Ease of Use

The Oracle PCA is assembled, cabled and pre-installed at the factory, thus eliminating configuration errors and reducing setup time. Administrators are free to focus on transforming the IT infrastructure and delivering flexible services to respond to the organization's requirements. By leveraging the advantages of an integrated system, they save the time normally required for planning and configuring the infrastructure from scratch. Provisioning new applications into flexible virtualized environments, in a fraction of the time required for physical deployments, generates substantial financial benefits. Within approximately one hour after power-on, the appliance is ready to create virtual servers.

Automated Deployment

With the Oracle PCA, users only need to move the rack into place in the data center, connect power, network and management Ethernet cables, and power on the system. The controller software orchestrates the installation and configuration of the entire hardware and software environment. At the end of the provisioning process, the user enters the basic configuration properties of the data center environment in the Oracle PCA Dashboard, so that the controller software can prepare the appliance for integration with your existing infrastructure.

Compute capacity is extended by adding more compute nodes, one server at a time. The integration of expansion compute nodes is seamless: slide the server into the next available rack unit, connect the cables, and let the controller software discover the new hardware.

For a detailed description of provisioning and orchestration, refer to the section Provisioning and Orchestration in the Oracle Private Cloud Appliance Administrator's Guide.

Network Virtualization

High-performance, low-latency Oracle Fabric Interconnect with Oracle SDN, two products in the Oracle Virtual Networking family, allow automated configuration of the server and storage networks. Oracle SDN

dynamically connects servers to networks and storage. It eliminates the physical storage and networking cards found in every server and replaces them with virtual network interface cards (vNICs) and virtual host bus adapters (vHBAs) that can be deployed on the fly. Applications and operating systems see these virtual resources exactly as they would see their physical counterparts. Oracle Virtual Networking simplifies complex data center deployments with a wire-once solution and simple software-defined network configurations.

Integrated Storage

Oracle PCA features a fully integrated, enterprise-grade Sun ZFS Storage Appliance 7320 for centrally storing the management environment as well as providing data storage for VMs. This storage subsystem is built using Oracle's enterprise-class storage products and technology and is designed to be fully redundant for maximum fault tolerance and serviceability in production. In addition, each compute node offers extra disk space that can be used as local storage for the virtual infrastructure deployed on it.

The storage capacity of Oracle PCA can be expanded beyond the internal, included storage, to external data center racks containing more than one Oracle ZFS Storage Appliance or supported storage available from other storage vendors.

High Availability

The Oracle PCA is designed for high availability at every level.

During the factory installation of Oracle PCA, the two 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. The management node that has control over the lock file automatically becomes the master or active node in the cluster. The master management node is always available via the same virtual IP address, thus ensuring continuity of service up to the level of the Dashboard user interface. In case 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 brings up all the required Oracle PCA services. The management node failover process takes up to 5 minutes to complete.

In addition, all configuration databases are stored on the Sun ZFS Storage Appliance 7320, to which components have shared access. The risk of data loss or interruption of service is further reduced by redundant network hardware, clustered storage heads, and a RAID-Z disk configuration that tolerates media failure and automatically detects and corrects bit errors.

For more information about high availability, refer to the section High Availability in the Oracle Private Cloud Appliance Administrator's Guide.

Templates and Assemblies

Within a matter of hours, the system is ready and users can start adding VMs. These can be created from scratch, or deployed from ready-to-run Oracle VM templates and assemblies. As a result, Oracle PCA offers out-of-the-box support for thousands of Oracle and third-party applications. This way, complex Oracle software stacks can be rapidly deployed.

The ability to quickly and easily deploy applications to a highly scalable virtualized environment reduces time to market for the business, and allows IT to rapidly deploy and scale test, development, and staging environments.

Operating System and Application Support

Support for many operating systems and your choice of storage protects your investment and provides easy deployment into your data centers. Getting applications to users requires a lot more than just

hardware provisioning. End-users need their applications provisioned as well. Oracle PCA accelerates deployment of the full hardware-to-applications stack so you can get applications to users within hours of power-on, rather than days or weeks.

Oracle VM supports up to 128 vCPUs and a variety of guest OSs such as Oracle Linux, Oracle Solaris, and Microsoft Windows. Entire Oracle application stacks can be deployed in minutes to hours using Oracle VM templates and assemblies. By default, all Oracle software that has been certified for use with Oracle VM is certified for Oracle PCA, which includes the Oracle Database, Oracle Fusion Middleware, Oracle Applications, and Oracle Real Application Clusters.

Chapter 3 Configuration Maximums

This chapter contains the configuration maximums for Oracle Private Cloud Appliance. The limits presented in the following tables represent tested, recommended limits, and are fully supported by Oracle.

Table 3.1 Virtual Machine Maximums

Item	Maximum	Notes
Virtual CPUs (X6-2)	44	Maximum for Oracle Server X6-2.
Virtual CPUs (X5-2)	36	Maximum for Oracle Server X5-2.
Virtual CPUs (X4-2)	16	Maximum for Sun Server X4-2.
Virtual CPUs (X3-2)	16	Maximum for Sun Server X3-2.
Virtual RAM (32-bit guest)	63GB	
Virtual RAM (64-bit guest)	750GB	The maximum is equivalent to the maximum installed amount of RAM (768GB) minus the memory used by `dom0` (approximately 16GB).
Virtual NICs (paravirtualized guest)	31	
Virtual NICs (hardware virtualized guest)	8	
Virtual Disks (paravirtualized guest)	PVM: 104 PVHVM: 107	
Disks: virtual and other (hardware virtualized guest)	4	In the case of hardware virtualized guests, "disks" refers to virtual disks as well as IDE and SCSI hard drives, and cd-rom drives.

> **Note**
>
> These maximums do not account for CPUs allocated to any other domains, such as the control domain. The hypervisor can allocate subsets of the overall CPU, memory, and I/O resources of a server to any given logical domain.
>
> Virtual Machine maximums assume a single virtual machine using all available resources.

Table 3.2 Oracle VM Server Maximums

Item	Maximum	Notes
CPUs (X6-2)	44	This is the number of CPUs available in the Oracle Server X6-2.
CPUs (X5-2)	36	This is the number of CPUs available in the Oracle Server X5-2.
CPUs (X4-2, X3-2)	16	This is the number of CPUs available in the Sun Server X4-2 and Sun Server X3-2.
RAM (X6-2, X5-2)	768GB	This is the maximum installed amount of RAM in the Oracle Server X6-2 and Oracle Server X5-2.
RAM (X4-2, X3-2)	256GB	This is the maximum installed amount of RAM in the Sun Server X4-2 and Sun Server X3-2.

Item	Maximum	Notes
Virtual Machines	128	

> **Note**
>
> A limited amount of RAM is required by the hypervisor.

Table 3.3 Server Pool and Cluster Maximums

Item	Maximum	Notes
Oracle VM Servers in a clustered server pool	30	In a base rack configuration, the maximum number of installed compute nodes is 25.
Clusters per Oracle PCA	8	This maximum does not include the default server pool.

Table 3.4 Storage Maximums

Item	Maximum	Notes
HBAs per Compute Node	8	This number is based on the 4 default HBAs plus 4 optional customer-defined HBAs.
LUNs per Server	256	
Paths per Server	1024	This is the main limitation. Examples of supported configuration are: 256 LUNs with 4 paths each, or 128 LUNs with 8 paths each.
Paths per LUN	8	
OCFS2 volume size	64TB	
Files per OCFS2 volume	30,000	
Virtual Disk size	10TB	The maximum is determined by the hardware capacity.
Virtual IDE drives per device	4	

Table 3.5 Networking Maximums

Item	Maximum	Notes
NICs per Bond	2	The limit is 255 per bond or aggregate.
Bonds per Compute Node	10	This maximum applies to custom networks. It does not include the default network configuration, which consists of 5 bonds and 1 GbE connection. Oracle PCA accepts a maximum of 3 custom internal networks and 7 custom external networks.
VLANs per Server Pool	128	If the number of VLANs is larger than 128 the boot times of the servers are severely impacted. The maximum is a total number across all internal, external, default and custom networks combined.
Packet Size (MTU)	Ethernet: 9000 IPoIB: 64000	The default maximum transmission unit for Ethernet bonds/ports is 9000 bytes. IPoIB traffic on the

Item	Maximum	Notes
		storage network is configured at a default MTU of 64000 bytes.

Chapter 4 Known Limitations and Workarounds

Table of Contents

This chapter provides information about the known limitations and workarounds for Oracle Private Cloud Appliance (PCA).

4.1 Oracle Private Cloud Appliance Hardware

This section describes hardware-related limitations and workarounds.

4.1.1 Compute Node Boot Sequence Interrupted by LSI Bios Battery Error

When a compute node is powered off for an extended period of time, a week or longer, the LSI BIOS may stop because of a battery error, waiting for the user to press a key in order to continue.

Workaround: Wait for approximately 10 minutes to confirm that the compute node is stuck in boot. Use the Reprovision button in the Oracle PCA Dashboard to reboot the server and restart the provisioning process.

Bug 16985965

4.1.2 Management Node Network Interfaces Are Down After System Restart

If the Oracle PCA needs to be powered down and restarted for maintenance or in the event of a power failure, the components should come back up in this order: first networking, then storage, and then the management and compute nodes. For detailed instructions to bring the appliance offline and return it to operation, refer to the section Powering Down Oracle Private Cloud Appliance in the Oracle Private Cloud Appliance Administrator's Guide.

It may occur that the management nodes complete their boot sequence before the appliance network configuration is up. In that case, the management nodes are unreachable because their `bond0` and `bond2` interfaces are down.

Workaround: Reboot the management nodes again. When they come back online, their network interfaces should be correctly configured.

Bug 17648454

4.1.3 Only One Oracle Switch ES1-24 May Be Connected Upstream

Do not connect port 24 of *both* internal Oracle Switch ES1-24 Ethernet switches to the next-level switch of your data center network. This causes spanning tree issues and provisioning failures. Only one IP address in this appliance management network range is available for customer use: 192.168.4.254. Make sure that the upstream network is configured to protect the appliance management network against DHCP leaks.

The upstream link from an Oracle Switch ES1-24 may only be used for out-of-band management of the Oracle PCA. It must never be used as a data path for virtual machines.

Workaround: Connect only one Oracle Switch ES1-24 (port 24) to the next-level data center switch. If provisioning failures have occurred, reprovision the affected compute nodes.

Bug 21554535

4.1.4 Sun ZFS Storage Appliance 7320 Firmware Upgrade Must Be Performed After Management Node Update to Release 2.0.2

The Oracle PCA Release 2.0.2 software contains firmware upgrades for a number of appliance hardware components. If you are using a base rack with Sun Server X3-2 management nodes and Sun ZFS Storage Appliance 7320, the firmware upgrade is likely to cause storage connectivity issues.

Workaround: Make sure that the Release 2.0.2 software is installed on the management nodes before you upgrade the ZFS storage appliance firmware.

Bug 20319302

4.1.5 ZFS Storage Appliance Firmware Upgrade and Network Configuration Fail with Appliance Software Release 2.1.1 or 2.2.1

During the controller software update from Release 2.0.5 to Release 2.1.1 or 2.2.1 an automated firmware upgrade takes place on the ZFS Storage Appliance. This upgrade, and the network configuration of the storage appliance, could fail if there is another user or process taking control of the console. Also, it has been observed that the text strings passed in the Pexpect commands sometimes have wrong or missing characters, which result in configuration errors.

Workaround: Make sure that there is no other activity on the ZFS Storage Appliance console, and that any external backup activity is suspended for the duration of the software update and firmware upgrade. If the firmware upgrade fails, retrying the same procedure could resolve the problem.

Bug 22269393

4.1.6 ILOM Service Processor Clocks Are Out-of-Sync

Most Oracle PCA components are equipped with an Oracle Integrated Lights Out Manager (ILOM). Each ILOM Service Processor (SP) contains its own clock, which is synchronized with the operating system (OS) clock before it leaves the factory. However, when new expansion nodes are installed or when parts in a component have been repaired or replaced, SP clocks could be out-of-sync. The problem may also be the result of a configuration error or normal clock drift.

If necessary, the SP clock can be synchronized manually. There is no need to continually update the hardware clock, because it only serves as a reference point for the host OS. Once the systems are up and running the OS obtains the correct time through NTP.

Workaround: After configuring the NTP server in the Oracle PCA Dashboard, synchronize the ILOM SPs with the OS clock. The easiest way is to log into the host and run this command: `hwclock --systohc`.

Bug 17664050

4.1.7 Expansion Rack Components Require Manual NTP Configuration

The components inside an Oracle PCA base rack are configured to synchronize to a time server on the management nodes. The NTP synchronization is automatically configured during installation or upgrade. Compute nodes in an expansion rack are also enabled for NTP and synchronized with the management nodes during provisioning. However, on expansion rack Ethernet and InfiniBand switches the NTP service must be configured manually.

> **Caution**
>
> Customers should not attempt to add an expansion rack to their Oracle PCA environment without proper guidance from Oracle. Please contact your Oracle representative for more information.

Workaround: Follow the instructions in the section Cable and Configure the Expansion Rack in the Oracle Private Cloud Appliance Installation Guide.

Bug 23322400

4.2 Oracle Private Cloud Appliance Software

This section describes software-related limitations and workarounds.

4.2.1 Do Not Install Additional Software on Appliance Components

Oracle PCA is delivered as an appliance: a complete and controlled system composed of selected hardware and software components. If you install additional software packages on the pre-configured appliance components, be it a compute node, management node or storage component, you introduce new variables that potentially disrupt the operation of the appliance as a whole. Unless otherwise instructed, Oracle advises against the installation of additional packages, either from a third party or from Oracle's own software channels like the Oracle Linux YUM repositories.

Workaround: Do not install additional software on any internal Oracle PCA system components. If your internal processes require certain additional tools, contact your Oracle representative to discuss these requirements.

4.2.2 Do Not Reconfigure Network During Compute Node Provisioning or Upgrade

In the Oracle PCA Dashboard, the Network Setup tab becomes available when the first compute node has been provisioned successfully. However, when installing and provisioning a new system, you must wait until all nodes have completed the provisioning process before changing the network configuration. Also, when provisioning new nodes at a later time, or when upgrading the environment, do not apply a new network configuration before all operations have completed. Failure to follow these guidelines is likely to leave your environment in an indeterminate state.

Workaround: Before reconfiguring the system network settings, make sure that no provisioning or upgrade processes are running.

Bug 17475738

4.2.3 Nodes Attempt to Synchronize Time with the Wrong NTP Server

External time synchronization, based on `ntpd` , is left in default configuration at the factory. As a result, NTP does not work when you first power on the Oracle PCA, and you may find messages in system logs similar to these:

```
Oct  1 11:20:33 ovcamn06r1 kernel: o2dlm: Joining domain ovca ( 0 1 ) 2 nodes
Oct  1 11:20:53 ovcamn06r1 ntpd_initres[3478]: host name not found:0.rhel.pool.ntp.org
Oct  1 11:20:58 ovcamn06r1 ntpd_initres[3478]: host name not found:1.rhel.pool.ntp.org
Oct  1 11:21:03 ovcamn06r1 ntpd_initres[3478]: host name not found:2.rhel.pool.ntp.org
```

Workaround: Apply the appropriate network configuration for your data center environment, as described in the section Network Setup in the Oracle Private Cloud Appliance Administrator's Guide. When the data center network configuration is applied successfully, the default values for NTP configuration are overwritten and components will synchronize their clocks with the source you entered.

Bug 17548941

4.2.4 Unknown Symbol Warning during InfiniBand Driver Installation

Towards the end of the management node `install.log` file, the following warnings appear:

```
> WARNING:
> /lib/modules/2.6.39-300.32.1.el6uek.x86_64/kernel/drivers/infiniband/ \
> hw/ipath/ib_ipath.ko needs unknown symbol ib_wq
> WARNING:
> /lib/modules/2.6.39-300.32.1.el6uek.x86_64/kernel/drivers/infiniband/ \
> hw/qib/ib_qib.ko needs unknown symbol ib_wq
> WARNING:
> /lib/modules/2.6.39-300.32.1.el6uek.x86_64/kernel/drivers/infiniband/ \
> ulp/srp/ib_srp.ko needs unknown symbol ib_wq
> *** FINISHED INSTALLING PACKAGES ***
```

These warnings have no adverse effects and may be disregarded.

Bug 16946511

4.2.5 Node Manager Does Not Show Node Offline Status

The role of the Node Manager database is to track the various states a compute node goes through during provisioning. After successful provisioning the database continues to list a node as *running*, even if it is shut down. For nodes that are fully operational, the server status is tracked by Oracle VM Manager. However, the Oracle PCA Dashboard displays status information from the Node Manager. This may lead to inconsistent information between the Dashboard and Oracle VM Manager, but it is not considered a bug.

Workaround: To verify the status of operational compute nodes, use the Oracle VM Manager user interface.

Bug 17456373

4.2.6 Compute Node State Changes Despite Active Provisioning Lock

The purpose of a lock of the type `provisioning` or `all_provisioning` is to prevent all compute nodes from starting or continuing a provisioning process. However, when you attempt to reprovision a running compute node from the Oracle PCA CLI while an active lock is in place, the compute node state changes to "reprovision_only" and it is marked as "DEAD". Provisioning of the compute node continues as normal when the provisioning lock is deactivated.

Bug 22151616

4.2.7 Compute Nodes Are Available in Oracle VM Server Pool Before Provisioning Completes

Compute node provisioning can take up to several hours to complete. However, those nodes are added to the Oracle VM server pool early on in the process, but they are not placed in maintenance mode. In theory the discovered servers are available for use in Oracle VM Manager, but you must not attempt to alter their configuration in any way before the Oracle PCA Dashboard indicates that provisioning has completed.

Workaround: Wait for compute node provisioning to finish. Do not modify the compute nodes or server pool in any way in Oracle VM Manager.

Bug 22159111

4.2.8 Reprovisioning or Upgrading a Compute Node Hosting Virtual Machines Leads to Errors

Reprovisioning or upgrading a compute node that hosts virtual machines (VMs) is considered bad practice. Good practice is to migrate all VMs away from the compute node before starting a reprovisioning operation or software update. At the start of the reprovisioning, the removal of the compute node from its server pool could fail partially, due to the presence of configured VMs that are either running or powered off. When the compute node returns to normal operation after reprovisioning, it could report failures related to server pool configuration and storage layer operations. As a result, both the compute node and its remaining VMs could end up in an error state. There is no straightforward recovery procedure.

Workaround: Avoid upgrade and reprovisioning issues due to existing VM configurations by migrating all VMs away from their host first.

Bug 23563071

4.2.9 Virtual Machines Remain in Running Status when Host Compute Node Is Reprovisioned

Using the Oracle PCA CLI it is possible to force the reprovisioning of a compute node even if it is hosting running virtual machines. The compute node is not placed in maintenance mode when running Oracle VM Server 3.2.11. Consequently, the active virtual machines are not shut down or migrated to another compute node. Instead these VMs remain in *running* status and Oracle VM Manager reports their host compute node as "N/A".

> ⚠ **Caution**
>
> Reprovisioning a compute node that hosts virtual machines is considered bad practice. Good practice is to migrate all virtual machines away from the compute node before starting a reprovisioning operation or software update.

Workaround: In this particular condition the VMs can no longer be migrated. They must be killed and restarted. After a successful restart they return to normal operation on a different host compute node in accordance with start policy defined for the server pool.

Bug 22018046

4.2.10 Provisioning Is Slow in Systems with Many VMs and VLANs

As the Oracle VM environment grows and contains more and more virtual machines and many different VLANs connecting them, the number of management operations and registered events increases rapidly. In a system with this much activity the provisioning of a compute node takes significantly longer, because the provisioning tasks run through the same management node where Oracle VM Manager is active. There is no impact on functionality, but the provisioning tasks can take several hours to complete.

There is no workaround to speed up the provisioning of a compute node when the entire system is under heavy load. It is recommended to perform compute node provisioning at a time when system activity is at its lowest.

Bug 22159038 and 22085580

4.2.11 Static Routes for Custom Host Networks Are Not Configured on Compute Nodes

The *host network* is a custom network type that enables connectivity between the physical Oracle PCA hosts and external network resources. As part of the host network configuration, a static route is configured on each server participating in the network. However, the required static route can only be configured if the server in question has been upgraded to the version of Oracle VM Server included in Release 2.2.1 of the Oracle Private Cloud Appliance Controller Software. If a host is running a previous version its routing table is not updated.

Workaround: If you intend to use a host network in your environment, make sure that the compute nodes are running the correct version of Oracle VM Server, as included in the Release 2.2.1 ISO image of the Oracle PCA Controller Software.

Bug 23182978 and 23233700

4.2.12 Altering Custom Network VLAN Tag Is Not Supported

When you create a custom network, it is technically possible – though not supported – to alter the VLAN tag in Oracle VM Manager. However, when you attempt to add a compute node, the system creates the network bond on the server but fails to enable the modified VLAN configuration. At this point the custom network is stuck in a failed state: neither the network nor the vNIC bond can be deleted, and the VLAN configuration can no longer be changed back to the original tag.

Workaround: Do not modify appliance-level networking in Oracle VM Manager. There are no documented workarounds and any recovery operation is likely to require significant downtime of the Oracle PCA environment.

Bug 23250544

4.2.13 Update Functionality Not Available in Dashboard

The Oracle PCA Dashboard cannot be used to perform an update of the software stack.

Workaround: Use the command line tool `pca-updater` to update the software stack of your Oracle PCA. For details, refer to the section Oracle Private Cloud Appliance Software Update in the Oracle Private Cloud Appliance Administrator's Guide. For step-by-step instructions, refer to the section Update. You can use SSH to log in to each management node and check `/etc/pca-info` for log entries indicating restarted services and new software revisions.

Bug 17476010, 17475976 and 17475845

4.2.14 Interrupting Download of Software Update Leads to Inconsistent Image Version and Leaves Image Mounted and Stored in Temporary Location

The first step of the software update process is to download an image file, which is unpacked in a particular location on the ZFS storage appliance. When the download is interrupted, the file system is not cleaned up or rolled back to a previous state. As a result, contents from different versions of the software image may end up in the source location from where the installation files are loaded. In addition, the downloaded `*.iso` file remains stored in `/tmp` and is not unmounted. If downloads are frequently started and stopped, this could cause the system to run out of free loop devices to mount the `*.iso` files, or even to run out of free space.

Workaround: The files left behind by previous downloads do not prevent you from running the update procedure again and restarting the download. Download a new software update image. When it completes

successfully you can install the new version of the software, as described in the section Update in the Oracle Private Cloud Appliance Administrator's Guide.

Bug 18352512

4.2.15 Compute Nodes Lose Oracle VM iSCSI LUNs During Software Update

Several iSCSI LUNs, including the essential server pool file system, are mapped on each compute node. When you update the appliance software, it may occur that one or more LUNs are missing on certain compute nodes. In addition, there may be problems with the configuration of the clustered server pool, preventing the existing compute nodes from joining the pool and resuming correct operation after the software update.

Workaround: To avoid these software update issues, upgrade all previously provisioned compute nodes by following the procedure described in the section Upgrading Existing Compute Node Configuration from Release 1.0.2 in the Oracle Private Cloud Appliance Administrator's Guide.

Bugs 17922555, 18459090, 18433922 and 18397780

4.2.16 Customer Created LUNs Are Mapped to the Wrong Initiator Group

When adding LUNs on the Oracle PCA internal ZFS Storage Appliance you must add them under the "OVM" target group, because this target groups exists by default and there can be only one. However, if you continue to use default settings the new LUNs are mapped to the **"All Initiators"** group. This means that the LUNs are mapped to all nodes in the system, and this causes several problems inside the appliance rack. Instead, LUNs must be associated with a different initiator group so that the appliance software can map them correctly at initial setup or during a software update.

Workaround: When creating additional LUNs on the internal ZFS Storage Appliance, do not map to the default `All Initiators` group but use a separate one instead.

Bugs 22309236 and 18155778

4.2.17 Virtual Machine File Systems Become Read-Only after Storage Head Failover

When a failover occurs between the storage heads of the Oracle PCA internal ZFS storage appliance, or an externally connected ZFS storage appliance, the file systems used by virtual machines may become read-only, preventing normal VM operation. Compute nodes may also hang or crash as a result.

Workaround: There is no documented workaround to prevent the issue. Once the storage head failover has completed, you can reboot the virtual machines to bring them back online in read-write mode.

Bugs 19324312 and 19670873

4.2.18 Oracle VM Manager Tuning Settings Are Lost During Software Update

During the Oracle PCA software update from Release 1.0.2 to Release 1.1.x, it may occur that the specific tuning settings for Oracle VM Manager are not applied correctly, and that default settings are used instead.

Workaround: Verify the Oracle VM Manager tuning settings and re-apply them if necessary. Follow the instructions in the section Verifying and Re-applying Oracle VM Manager Tuning after Software Update in the Oracle Private Cloud Appliance Administrator's Guide.

Bug 18477228

4.2.19 Oracle VM Manager Fails to Restart after Restoring a Backup Due to Password Mismatch

If you have changed the password for Oracle VM Manager or its related components Oracle WebLogic Server and Oracle MySQL database, and you need to restore the Oracle VM Manager from a backup that was made prior to the password change, the passwords will be out of sync. As a result of this password mismatch, Oracle VM Manager cannot connect to its database and cannot be started.

Workaround: Follow the instructions in Restoring a Backup After a Password Change in the Oracle Private Cloud Appliance Administrator's Guide.

Bug 19333583

4.2.20 SSH Host Key Mismatch After Management Node Failover

When logging in to the active management node using SSH, you typically use the virtual IP address shared between both management nodes. However, since they are separate physical hosts, they have a different host key. If the host key is stored in the SSH client, and a failover to the secondary management node occurs, the next attempt to create an SSH connection through the virtual IP address results in a host key verification failure.

Workaround: Do not store the host key in the SSH client. If the key has been stored, remove it from the client's file system; typically inside the user directory in `.ssh/known_hosts`.

Bug 22915408

4.2.21 Oracle VM Java Processes Consume Large Amounts of Resources

Particularly in environments with a large number of virtual machines, and when many virtual machine operations – such as start, stop, save, restore or migrate – occur in a short time, the Java processes of Oracle VM may consume a lot of CPU and memory capacity on the master management node. Users will notice the browser and command line interfaces becoming very slow or unresponsive. This behavior is likely caused by a memory leak in the Oracle VM CLI.

Workaround: A possible remedy is to restart the Oracle VM CLI from the Oracle Linux shell on the master management node.

```
# /u01/app/oracle/ovm-manager-3/ovm_cli/bin/stopCLIMain.sh
# nohup /u01/app/oracle/ovm-manager-3/ovm_cli/bin/startCLIMain.sh&
```

Bug 18965916

4.2.22 External Storage Cannot Be Discovered Over Data Center Network

The default compute node configuration does not allow connectivity to additional storage resources in the data center network. Compute nodes are connected to the data center subnet to enable public connectivity for the virtual machines they host, but the compute nodes' physical network interfaces have no IP address in that subnet. Consequently, SAN or file server discovery will fail.

Bug 17508885

4.2.23 Fibre Channel LUNs Presented to Management Nodes Cause Kernel Panic

Fibre Channel LUNs should only be presented to compute nodes. Presenting the LUNs to the management nodes can cause their kernel to panic. Use proper (soft) zoning on the FC switch to prevent

the management nodes from accessing the LUNs. For details, refer to the support note with Doc ID 2148589.1.

Bug 22983265

4.2.24 High Network Load with High MTU May Cause Time-Out and Kernel Panic in Compute Nodes

When network throughput is very high, certain conditions, like a large number of MTU 9000 streams, have been known to cause a kernel panic in a compute node. In that case, `/var/log/messages` on the affected compute node contains entries like *"Task Python:xxxxx blocked for more than 120 seconds"*. As a result, HA virtual machines may not have been migrated in time to another compute node. Usually compute nodes return to their normal operation automatically.

Workaround: If HA virtual machines have not been live-migrated off the affected compute node, log into Oracle VM Manager and restart the virtual machines manually. If an affected compute node does not return to normal operation, restart it from Oracle VM Manager.

Bugs 20981004 and 21841578

4.2.25 Oracle PCA Dashboard URL Is Not Redirected

Before the product name change from Oracle Virtual Compute Appliance to Oracle Private Cloud Appliance, the Oracle PCA Dashboard could be accessed at *https://`<manager-vip>`:7002/ovca*. As of Release 2.0.5, the URL ends in `/dashboard` instead. However, there is no redirect from `/ovca` to `/dashboard`.

Workaround: Enter the correct URL: *https://`<manager-vip>`:7002/dashboard*.

Bug 21199163

4.2.26 Network View in Oracle PCA Dashboard Contains Misaligned Labels with Screen Reader Enabled

When you activate the Screen Reader, through the Accessibility Options at login or in the Settings toolbar, the labels on the network ports of the I/O modules in the Network View tab of the Oracle PCA Dashboard are no longer correctly aligned with the background image.

There is no workaround available.

Bug 23099040

4.2.27 Component Status Not Displayed in Oracle Enterprise Manager and Oracle PCA Dashboard

Due to an Oracle PCA internal identification code change for the Ethernet switches and ZFS storage appliance, the Oracle Enterprise Manager plugin is unable to display status information for the Oracle Switch ES1-24 and Oracle ZFS Storage Appliance.

The Hardware View in the Oracle PCA Dashboard is affected in a similar way: it displays a blank filler panel where the Oracle Switch ES1-24 Ethernet switches should appear, and status information is also missing.

Workaround: The ZFS storage appliance can be monitored and managed through its own interface. There is no workaround for the missing status information in the Dashboard and Enterprise Manager interfaces.

Bug 23512182

4.2.28 User Interface Does Not Support Internet Explorer 10 and 11

Oracle PCA Release 2.2.1 uses the Oracle Application Development Framework (ADF) version 11.1.1.2.0 for both the Dashboard and the Oracle VM Manager user interface. This version of ADF does not support Microsoft Internet Explorer 10 or 11.

Workaround: Use Internet Explorer 9 or a different web browser; for example Mozilla Firefox.

Bug 18791952

4.2.29 Mozilla Firefox Cannot Establish Secure Connection with User Interface

Both the Oracle PCA Dashboard and the Oracle VM Manager user interface run on an architecture based on Oracle WebLogic Server, Oracle Application Development Framework (ADF) and Oracle JDK 6. The cryptographic protocols supported on this architecture are SSLv3 and TLSv1.0. Mozilla Firefox version 38.2.0 or later no longer supports SSLv3 connections with a self-signed certificate. As a result, an error message might appear when you try to open the user interface login page.

In Oracle PCA Release 2.1.1 – with Oracle VM Release 3.2.10 – a server-side fix eliminates these secure connection failures. If secure connection failures occur with future versions of Mozilla Firefox, the workaround below might resolve them.

Workaround: Override the default Mozilla Firefox security protocol as follows:

1. In the Mozilla Firefox address bar, type `about:config` to access the browser configuration.

2. Acknowledge the warning about changing advanced settings by clicking *I'll be careful, I promise!*.

3. In the list of advanced settings, use the Search bar to filter the entries and look for the settings to be modified.

4. Double-click the following entries and then enter the new value to change the configuration preferences:

    - `security.tls.version.fallback-limit: 1`

    - `security.ssl3.dhe_rsa_aes_128_sha: false`

    - `security.ssl3.dhe_rsa_aes_256_sha: false`

5. If necessary, also modify the configuration preference `security.tls.insecure_fallback_hosts` and enter the affected hosts as a comma-separated list, either as domain names or as IP addresses.

6. Close the Mozilla Firefox advanced configuration tab. The pages affected by the secure connection failure should now load normally.

Bug 21622475 and 21803485

4.2.30 Authentication Error Prevents Oracle VM Manager Login

In environments with a large number of virtual machines and frequent connections through the VM console of Oracle VM Manager, the browser UI login to Oracle VM Manager may fail with an *"unexpected error during login"*. A restart of the `ovmm` service is required.

Workaround: From the Oracle Linux shell of the master management node, restart the `ovmm` service by entering the command `service ovmm restart`. You should now be able to log into Oracle VM Manager again.

Bug 19562053

4.2.31 Error Getting VM Stats in Oracle VM Agent Logs

During the upgrade to Oracle PCA Software Release 2.0.4 a new version of the Xen hypervisor is installed on the compute nodes. While the upgrade is in progress, entries may appear in the `ovs-agent.log` files on the compute nodes indicating that `xen` commands are not executed properly (*"Error getting VM stats"*). This is a benign and temporary condition resolved by the compute node reboot at the end of the upgrade process. No workaround is required.

Bug 20901778

4.2.32 Virtual Machine with High Availability Takes Five Minutes to Restart when Failover Occurs

The compute nodes in an Oracle PCA are all placed in a single clustered server pool during provisioning. A clustered server pool is created as part of the provisioning process. One of the configuration parameters is the cluster time-out: the time a server is allowed to be unavailable before failover events are triggered. To avoid false positives, and thus unwanted failovers, the Oracle PCA server pool time-out is set to 300 seconds. As a consequence, a virtual machine configured with high availability (HA VM) can be unavailable for 5 minutes when its host fails. After the cluster time-out has passed, the HA VM is automatically restarted on another compute node in the server pool.

This behavior is as designed; it is not a bug. The server pool cluster configuration causes the delay in restarting VMs after a failover has occurred.

4.2.33 Compute Node CPU Load at 100 Percent Due to Hardware Management Daemon

The Hardware Management daemon, which runs as the process named `hwmgmtd`, can sometimes consume a large amount of CPU capacity. This tends to become worse over time and eventually reach 100 percent. As a direct result, the system becomes less responsive over time.

Workaround: If you find that CPU load on a compute node is high, log in to its Oracle Linux shell and use the `top` command to check if `hwmgmtd` is consuming a lot of CPU capacity. If so, restart the daemon by entering the command `/sbin/service hwmgmtd restart`.

Bug 23174421

4.2.34 CLI Output Misaligned When Listing Tasks With Different UUID Length

To simplify task management in the CLI the task identifiers (UUIDs) have been shortened. After an upgrade from a Release 2.0.x the task list may still contain entries from before the upgrade, resulting in misaligned entries due to the longer UUID. The command output then looks similar to this example:

```
PCA> list task
Task_ID          Status   Progress Start_Time           Task_Name
-------          ------   -------- ----------           ---------
3327cc9b1414e2   RUNNING  None     08-18-2015 11:45:54  update_download_image
9df321d37eed4bfea74221d22c26bfce SUCCESS       100 08-18-2015 09:59:08
update_run_ovmm_upgrader
```

```
8bcdcdf785ac4dfe96406284f1689802 SUCCESS          100 08-18-2015 08:46:11
update_download_image
f1e6e60351174870b853b24f8eb7b429 SUCCESS          100 08-18-2015 04:00:01  backup
e2e00c638b9e43808623c25ffd4dd42b SUCCESS          100 08-17-2015 16:00:01  backup
d34325e2ff544598bd6dcf786af8bf30 SUCCESS          100 08-17-2015 10:47:20
update_download_image
dd9d1f3b5c6f4bf187298ed9dcffe8f6 SUCCESS          100 08-17-2015 04:00:01  backup
a48f438fe02d4b9baa91912b34532601 SUCCESS          100 08-16-2015 16:00:01  backup
e03c442d27bb47d896ab6a8545482bdc SUCCESS          100 08-16-2015 04:00:01  backup
f1d2f637ad514dce9a3c389e5e7bbed5 SUCCESS          100 08-15-2015 16:00:02  backup
c4bf0d86c7a24a4fb656926954ee6cf2 SUCCESS          100 08-15-2015 04:00:01  backup
016acaf01d154095af4faa259297d942 SUCCESS          100 08-14-2015 16:00:01  backup
----------------
12 rows displayed
```

Workaround: It is generally good practice to purge old jobs from time to time. You can remove the old tasks with the command `delete task uuid`. When all old tasks have been removed the task list is output with correct column alignment.

Bug 21650772

4.2.35 The CLI Command `list opus-ports` Shows Information About Non-existent Switches

The CLI command `list opus-ports` lists ports for additional switches that are not present within your environment. These switches are labelled OPUS-3, OPUS-4, OPUS-5 and OPUS-6 and are listed as belonging to rack numbers that are not available in a current deployment. This is due to the design, which caters to the future expansion of an environment. These entries are currently displayed in the listing of port relationships between compute nodes and each Oracle Switch ES1-24, and can be safely ignored.

Bug 18904287

4.2.36 The CLI Command `diagnose software` Reports Incorrect Test Failures

The Oracle PCA CLI provides the `diagnose software` command to run a series of software acceptance tests on a newly installed or upgraded appliance. Unfortunately, the following tests are expected to fail:

- Test 973 - Simple connectivity Acceptance

  The test relies on a script that was modified to display a warning message for a deprecated command. This warning message is inadvertently parsed as output, thus preventing correct execution of the test scripts.

- Test 927 - OVM server model Acceptance

  The scripts used in this test fail to identify the correct Oracle VM version installed on the compute nodes and referenced in the YUM repository settings. This test could also fail if there are compute nodes in an expansion rack, because those are not part of a server pool by default.

- Test 1079 - Test for shares mounted on CNs Acceptance

  This test could also fail if there are compute nodes in an expansion rack, because those have no shared file system mounted by default.

There is no workaround. It is highly likely that the software performs as expected despite these failures.

Bug 23570036

4.2.37 The CLI Command `diagnose ilom` Cannot Handle Long Messages

The Oracle PCA CLI provides the `diagnose ilom` command to check the health of a hardware component based on the information registered by the ILOM. If the output contains a particularly long message, the underlying pexpect library can time out and cause a failure.

There is no workaround available.

Bug 23592505

Chapter 5 Feedback and Support

Table of Contents

This chapter contains information about how to provide feedback and contact support for the Oracle Private Cloud Appliance (PCA) product.

> **Note**
>
> Customers who use Oracle Auto Service Request (ASR) do not need to submit a service request through My Oracle Support for the specific hardware failure scenarios covered by ASR. For details, refer to the chapter Automating Oracle Private Cloud Appliance Service Requests of the Oracle Private Cloud Appliance Administrator's Guide

> **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.

5.1 Providing Feedback and Reporting Problems

If you need to report an issue and have an Oracle Premier Support Agreement, you should open a case with Oracle Support at https://support.oracle.com.

If you are reporting an issue, please provide the following information where applicable:

- Description of the problem, including the situation where the problem occurs, and its impact on your operation.

- Machine type, operating system release, browser type and version, locale and product release, including any patches you have applied, and other software that might be affecting the problem.

- Detailed steps on the method you have used, to reproduce the problem.

- Any error logs or core dumps.

5.2 Contacting Oracle Specialist Support

If you have an Oracle Customer Support Identifier (CSI), first try to resolve your issue by using My Oracle Support at https://support.oracle.com. Your Oracle Premier Support CSI does not cover customization support, third-party software support, or third-party hardware support.

If you cannot resolve your issue, open a case with the Oracle specialist support team for technical assistance on break/fix production issues. The responding support engineer will need the following information to get started:

- Your Oracle Customer Support Identifier.

- The product you are calling about.

- A brief description of the problem you would like assistance with.

- Any logs or support data you have, see Section 5.3, "Data Collection for Service and Support" for details.

If your CSI is unknown, find the correct Service Center for your country (http://www.oracle.com/us/support/contact-068555.html), then contact Oracle Services to open a non-technical service request (SR) to get your CSI sorted. Once you have your CSI, you can proceed to open your case through My Oracle Support.

5.3 Data Collection for Service and Support

When submitting a Service Request (SR), please include an archive file with the relevant log files and debugging information as listed in this section. This information can be used by Oracle Support to analyze and diagnose system issues. The support data files can be uploaded for further analysis by Oracle Support.

Tip

Collecting support files involves logging in to the command line on components in your Oracle PCA rack and copying files to a storage location external to the appliance environment, in the data center network. This can only be achieved from a system with access to both the internal appliance management network and the data center network. You can set up a physical or virtual system with those connections, or use the master management node.

The most convenient way to collect the necessary files, is to mount the target storage location on the system using `nfs`, and copy the files using `scp` with the appropriate login credentials and file path. The command syntax should be similar to this example:

```
# mkdir /mnt/mynfsshare
# mount -t nfs storage-host-ip:/path-to-share /mnt/mynfsshare
# scp root@component-ip:/path-to-file /mnt/mynfsshare/pca-support-data/
```

Collecting Oracle Private Cloud Appliance Support Data

Warning

For more accurate diagnosis of physical server issues, Oracle Support Services require a system memory dump. For this purpose, `kdump` must be installed and configured on the component under investigation. The entire procedure is described in the support note with Doc ID 1520837.1. By default, `kdump` is installed on all Oracle PCA compute nodes and configured to write the system memory dump to the ZFS storage appliance at this location: `192.168.4.1:/export/nfs_repository1/`.

Caution

For diagnostic data collection, Oracle Support Services recommend that the OSWatcher tool be run for an extended period of time. For details about the use of OSWatcher, please consult the support note with Doc ID 580513.1. OSWatcher is installed by default on all Oracle PCA compute nodes.

For diagnostic purposes, Oracle Support Services use a tool called `pca-diag` that automatically collects vital troubleshooting information from your Oracle PCA environment. This tool is part of the Oracle PCA

controller software installed on both management nodes and on all compute nodes. Its capabilities are described in the section "Oracle Private Cloud Appliance Diagnostics Tool" in the Oracle Private Cloud Appliance Administrator's Guide.

To collect support data from your system, proceed as follows:

1. Log in to **the master management node** as root.

2. Run `pca-diag` with the appropriate command line arguments.

   > **Note**
   >
   > 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 the most complete set of diagnostic data, run the command with both arguments: `pca-diag ilom vmpinfo`.

   - `pca-diag ilom`

     Use this command to detect and diagnose potential component hardware and software problems.

     ```
     [root@ovcamn05r1 ~]# pca-diag ilom

     Oracle Private Cloud Appliance diagnostics tool

     Gathering Linux information...
     Gathering system messages...
     Gathering PCA related files...
     Gathering OS version information...
     Gathering host specific information...
     Gathering PCI information...
     Gathering SCSI and partition data...
     Gathering OS process data...
     Gathering network setup information...
     Gathering installed packages data...
     Gathering disk information...
     Gathering ILOM Service Processor data... this may take a while
     Generating diagnostics tarball and removing temp directory

     ===============================================================================
     Diagnostics completed. The collected data is available in:
     /tmp/pcadiag_ovcamn05r1_<ID>_<date>_<time>.tar.bz2
     ===============================================================================
     ```

   - `pca-diag vmpinfo`

     Use this command to detect and diagnose potential problems in the Oracle VM environment.

     > **Note**
     >
     > To collect diagnostic information for a subset of the Oracle VM Servers in the environment, run the command with an additional `servers` parameter, as shown in the example below.

     ```
     [root@ovcamn05r1 ~]# pca-diag vmpinfo servers='ovcacn07r1,ovcacn08r1'

     Oracle Private Cloud Appliance diagnostics tool
     Gathering Linux information...
     Gathering system messages...
     Gathering PCA related files...
     Gathering OS version information...
     ```

```
Gathering host specific information...
Gathering PCI information...
Gathering SCSI and partition data...
Gathering OS process data...
Gathering network setup information...
Gathering installed packages data...
Gathering disk information...
Gathering FRU data and console history. Use ilom option for complete ILOM data.
```

When the `vmpinfo3` script is called as a sub-process from `pca-diag`, the console output continues as follows:

```
Running vmpinfo tool...
Gathering files from servers: ovcacn07r1,ovcacn08r1  This process may take some time.
The following server(s) will get info collected: [ovcacn07r1,ovcacn08r1]
Gathering OVM Model Dump files
Gathering sosreport from ovcacn07r1
Gathering sosreport from ovcacn08r1
Gathering OVM Manager Logs
Gathering manager sosreport.
```

When all files have been collected, the data is compressed into two tarballs. One is from the `pca-diag` tool, while `vmpinfo3` writes a separate tarball with its own specific data.

```
Compressing VMPinfo3 <date>-<time>.
===================================================================================
Please send /tmp/vmpinfo3-<version>-<date>-<time>.tar.gz to Oracle OVM support
===================================================================================

Generating diagnostics tarball and removing temp directory
=============================================================================
Diagnostics completed. The collected data is available in:
/tmp/pcadiag_ovcamn05r1_<ID>_<date>_<time>.tar.bz2
=============================================================================
```

3. If necessary, run `pca-diag`, with or without the `ilom` argument, on some or all compute nodes as well.

4. To allow better analysis of physical server issues, for example hanging, crashing or rebooting, also include the system memory dump file (`vmcore`).

   The location of the file is: `<kdump-partition-mount-point>/var/crash/127.0.0.1-<date>-<time>/vmcore`. The partition and mount point are defined during `kdump` configuration. By default, `kdump` writes to `192.168.4.1:/export/nfs_repository1/`. For details, please consult the support note with Doc ID 1520837.1.

5. When required, collect the OSWatcher logs from the compute nodes. The default location is `/opt/osw`.

   For details, please consult the support note with Doc ID 580513.1.

6. Copy all diagnostic files to a location external to the appliance environment.

Uploading Support Data Files

For support data up to 2 GB, upload the file as part of the Service Request (SR) process in My Oracle Support (MOS).

- If you are still in the process of logging the SR, upload the support data in the **Upload Files/Attachments** step of the SR.

- If you have already logged the SR and need to upload files afterwards, proceed as follows:

  1. Log into MOS and open the **Dashboard** or **Service Request** tab.

  2. In the **Service Request** region, click the SR you want to update.

  3. In the **Update** section, select **Add Attachment**.

  4. In the pop-up window, select the file for upload, include any notes, and click **Attach File**.

If uploading the support data with the SR is not an option, or for support data files over 2 GB in size, use the FTPS file upload service from Oracle support at `transport.oracle.com`. Oracle Support might request that you upload using a different mechanism.

1. Using an FTPS client, for example FileZilla or WinSCP, access the My Oracle Support File Upload Service `transport.oracle.com` in *passive* mode.

2. Log in with your Oracle Single Sign-On user name and password.

3. Select the support data file to upload.

4. Select a destination for the file.

   Use the directory path provided by Oracle Support.

   Typically, the directory path is constructed as follows: "`/upload/issue/<sr_number>/`".

   The use of a SR number ensures that the file is correctly associated with the service request. Write down the full path to the file and the SR number for future reference in communications with Oracle Support.

5. Upload the file.

   When the upload is complete, a confirmation message is displayed.

> **Note**
>
> If you prefer to use a command-line client, for example cURL, you typically enter a single command to connect, authenticate and complete the upload. A cURL command will look similar to this example: `curl -T <path_to_file> -u "<user>" ftps://transport.oracle.com/upload/issue/<sr_number>/`. For security reasons, it is recommended that you leave the password out of the command and be prompted to enter the password.

For detailed information about uploading files to Oracle Support, refer to the support note with Doc ID 1547088.2.