

Oracle® Enterprise Manager Ops Center

Configuring and Installing Root Domains

12c Release 2 (12.2.2.0.0)

E50416-03

December 2014

This guide provides an end-to-end example for how to use Oracle Enterprise Manager Ops Center.

Introduction

Using Oracle Enterprise Manager Ops Center, you can configure and install root domains on Oracle VM Server for SPARC systems.

A logical domain is a virtual machine with resources, such as CPU threads, memory, I/O devices, and its own operating system. A root domain is a logical domain that has PCIe root complexes assigned to it. The PCIe bus and all the devices on it are owned by the root domain. From the root domain, you can allocate PCIe Endpoint devices to other logical domains.

When you provision Oracle VM Server for SPARC using Oracle Enterprise Manager Ops Center, ensure to select the option to detach the unused buses. The unused buses are detached from the primary domain and are available for creating root domains. Refer to *Oracle Enterprise Manager Ops Center Configuring and Deploying Oracle VM Server for SPARC* for more information about deploying Oracle VM Server for SPARC.

The number of root domains that you can create depends on the number of PCIe buses that are available on the server hardware.

In this guide, a root domain is created on Oracle SPARC T4-2 server provisioned with Oracle VM Server for SPARC 3.1 version. The SPARC server has two PCIe buses. One PCIe bus, *pci_0*, is allocated to the primary domain and the other PCIe bus, *pci_1*, is detached and available for root domain creation.

What You Will Need

You need the following resources to configure and deploy a root domain:

- **Oracle VM Server for SPARC system**

Oracle SPARC T4-2 server installed and configured with Oracle VM Server for SPARC 3.1 version using Oracle Enterprise Manager Ops Center. Refer to the guide *Oracle Enterprise Manager Ops Center Configuring and Deploying Oracle VM Server for SPARC* for more information.

- **Network Connection**

Obtain the details of the Ethernet devices connected to the PCIe bus that will be assigned to the root domain. You must acquire the network interfaces in the PCIe Endpoint device that are physically connected to the required network.

The network to which the network interface is physically connected must be discovered and managed in Oracle Enterprise Manager Ops Center.

An IP address to be assigned to the root domain OS.

- **Storage Libraries**

The local filesystem library is used for virtual disks of the root domain. The root domain is not migratable and hence the root domain metadata is stored in the local filesystem library automatically. In this example, 20 GB of virtual disk is created for the root domain.

- **OS Image**

You must install and configure Oracle Enterprise Manager Ops Center in Oracle Solaris 11 OS and populate the Oracle Solaris 11 Library with SRUs. You can select an Oracle Solaris 11 OS of particular SRU version.

Refer to *Oracle Enterprise Manager Ops Center Feature Reference Guide* for more information about uploading or importing OS images.

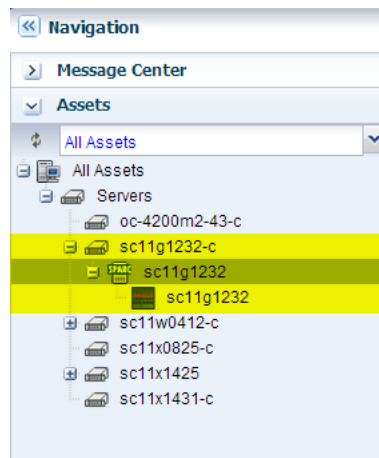
- **Roles and Permissions**

A user with the following roles:

- Virtualization admin role to create root domains and server provisioning.
- Plan/Profile admin role to create profiles and plan for root domain creation and provisioning.

Hardware and Software Configuration

In this example, the root domain is installed on Oracle VM Server for SPARC 3.1 version. The control domain is configured and deployed in stand-alone mode and it is not placed in a server pool.



The Oracle VM Server for SPARC 3.1 version **Summary** tab is displayed in the UI as follows:

sc11g1232

Dashboard Summary Analytics Virtual Services I/O Resources Libraries Networks

Name: sc11g1232
 Description: Oracle VM Server for SPARC
 CPU Info: Oracle SPARC T4
 2 socket(s)
 16 core(s)
 128 thread(s)
 Available CPU Threads: 127 out of 128
 Available CPU Cores: 15 out of 16
 Available Memory (RAM): 123 GB out of 127 GB
 Running Time: 12 day(s), 10:0 (HH:MM)

Oracle VM Server Status: Healthy
 Reachable: Yes
 Server Pool: -
 Oracle VM Server Version: 3.1.0.0.24

Tag Name	Value
legacy.tags	Idom \

Control Domain Specification

CPU Model: Virtual CPU
 CPU Threads: 1
 CPU Utilization: 2%

Memory Size (MB): 4096
 Physical Bindings: -

The **I/O Resources** tab of the control domain shows the PCIe buses and its allocation status. The **I/O Resources** tab of the control domain is displayed in the UI as follows:

sc11g1232

Dashboard Summary Analytics Virtual Services I/O Resources Libraries Networks Incidents Monitoring

Buses / Endpoint Devices SR-IOV Services

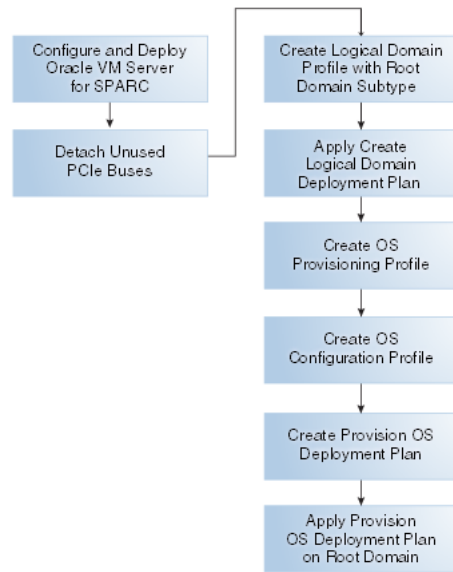
Alias	Bus name	Type	Domain
pcl_1	pcl@500	BUS	-
pcl_0	pcl@400	BUS	primary
niu_1	niu@580	NIU	primary
niu_0	niu@480	NIU	primary

PCIe Endpoint Devices (13)

Alias	Device Name	Root Domain	PCIe Bus	PCIe Slot Status	Domain
Ethernet Device (2)					
/SYS/MB/NET0	(Sub Devices : 16) pci@400/pcl@1/pcl@0/p...	primary	pcl_0	Occupied	primary
/SYS/MB/PCIE2	(Sub Devices : 128) pci@400/pcl@2/pcl@0/p...	primary	pcl_0	Occupied	primary
Fibre Channel Device (1)					
/SYS/MB/PCIE0	(Sub Devices : 4) pci@400/pcl@2/pcl@0/p...	primary	pcl_0	Occupied	primary
SCSI Device (1)					
/SYS/MB/SASHBA	(Sub Devices : 8) pci@400/pcl@2/pcl@0/p...	primary	pcl_0	Occupied	primary
[Unrecognized Device Type] (9)					
/SYS/MB/NET2	pci@500/pcl@1/pcl@0/p...		pcl_1	-	-
/SYS/MB/PCIE1	pci@500/pcl@2/pcl@0/p...		pcl_1	-	-
/SYS/MB/PCIE3	pci@500/pcl@2/pcl@0/p...		pcl_1	-	-
/SYS/MB/PCIE4	pci@400/pcl@2/pcl@0/p...	primary	pcl_0	Empty	primary
/SYS/MB/PCIE5	pci@500/pcl@2/pcl@0/p...		pcl_1	-	-
/SYS/MB/PCIE6	pci@400/pcl@1/pcl@0/p...	primary	pcl_0	Empty	primary
/SYS/MB/PCIE7	pci@500/pcl@1/pcl@0/p...		pcl_1	-	-

Configuring and Installing Root Domains

The necessary profiles and plans that must be created and applied to create root domains are illustrated in the following illustration:



The steps to configure and install root domain is as follows:

- [Creating a Root Domain Profile](#)
- [Deploying the Root Domain Plan](#)
- [Creating an OS Provisioning Profile](#)
- [Creating an OS Configuration Profile](#)
- [Creating a Provision OS Deployment Plan](#)
- [Applying Provision OS Deployment Plan On Root Domain](#)

Creating a Root Domain Profile

Create a root domain with the following resource requirements:

- Four CPU Threads.
- 4 GB of memory. You must provide at least 4 GB of memory for each I/O device.
- Native CPU architecture.
- Local file system for the virtual disks.

Do not provide any virtual network connection for the root domain. Instead, an Ethernet connection from one of the PCIe Endpoint device of the PCIe bus assigned to the root domain will be used for providing the physical network connection for OS provisioning.

To Create a Root Domain Profile

1. Select **Plan Management** section in the Navigation pane.
2. Expand **Profiles and Policies** and select **Logical Domain**.
3. Click **Create Profile** in the Actions pane.
The **Create Logical Domain Profile** wizard is displayed.
4. Enter a name and description to identify the profile.

Retain the option to create a deployment plan for this profile. Select Root Domain in the Subtype.

Identify Profile * Indicates Required Field

* Name: my_root_dom

Description:

Create a deployment plan for this profile.

* Subtype: Subtype
Guest Domain
HA Guest Domain
Physical IO Domain
Root Domain

Click **Next**.

5. Enter the name of the root domain as *root_dom* and the starting number as 1. The root domain will be created with the name as *root_dom1*.

Provide description and add new tags for the root domain. All the logical domains created using this profile uses the same description and tags.

Specify Domain Identity * Indicates Required Field

Enter the identification for the logical domain:

* Name: Automatic naming; Prefix: root_dom

Starting Number: 1

Description:

Tags: Search

Tag Name	Value

Click **Next** to configure the CPU Threads and memory.

6. The threads in the physical CPU of the Oracle VM Server are dedicated to the logical domains. Select Virtual CPU as the CPU model and enter the values for CPU Threads and memory to be allocated for the root domain:
 - 4 CPU Threads.
 - 4 GB of memory.
 - Do not specify a value for Crypto Units. Depending on the number of CPU threads, the Crypto units are assigned automatically.

Configure Logical Domain * Indicates Required Field

Enter the CPU and memory resource allocation for the logical domain.

CPU and Memory Settings

CPU Model: Virtual CPU Whole-Core

* CPU Threads:

CPU Architecture: generic native

Requested Crypto Units:

* Memory: GB

Click **Next** to specify the PCIe bus for the root domain.

- Specify the number of PCIe buses that must be allocated to the root domain. The number of bus allocated in this example is one.

Specify PCIe Buses

Specify the number of requested PCIe buses.

PCIe Buses	
Bus Type	Number of Buses
PCIe Bus	<input type="text" value="1"/>

Click **Next** to specify the storage for the logical domains.

- Click the **Add** icon to select the local filesystem library for the virtual disks. Enter the disk size as 20 GB. You can retain or edit the name of the virtual disk.

Specify Storage and Disks

Select a library to store the logical domain metadata and the libraries to be used for logical domain's storage.

Type	Library	LUN/Virtual Disk Name	Volume Group	Required Size(GB)
Local Filesys...	file:///guests	vdisk0	-	20

Click **Next**.

- Skip the step to specify the networks that must be used for OS provisioning. In this example, virtual network connection is not used. Instead, a physical network connection from one of the PCIe Endpoint device is provided.

Specify Networks

Select the networks to be connected to the logical domain and the number of connections for each network. The order of the networks entered would be used when binding the networks to the NICs during the profile execution.

Network Specifications

+ ×

Network Domain	Network	Number of Connections
No data		

Click **Next** to view the summary of the logical domain details.

10. Review the information and click **Finish** to save the profile.

Summary

Review the properties of the profile. Click Finish to save the profile.

Name: my_root_dom

Description:

Target Type: Oracle VM Server for SPARC

Automatic naming; Prefix: root_dom

Starting Number: 1

Description:

CPU Model: Virtual CPU

CPU Threads: 4

CPU Architecture: native

Requested Crypto Units: -

Memory: 4 GB

Number of PCIe Buses: 1

Metadata Library Type: Local

Metadata Library: file:///guests

Virtual Disks:

Type	Library	LUN/Virtual Disk Name	Volume Group	Required Size(GB)
Local	file:///guests	vdisk0	-	20

Network:

Network Domain	Network	Number of Connections
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The profile to create to the root domain and the corresponding deployment plan are created. Apply the deployment plan to create the root domain.

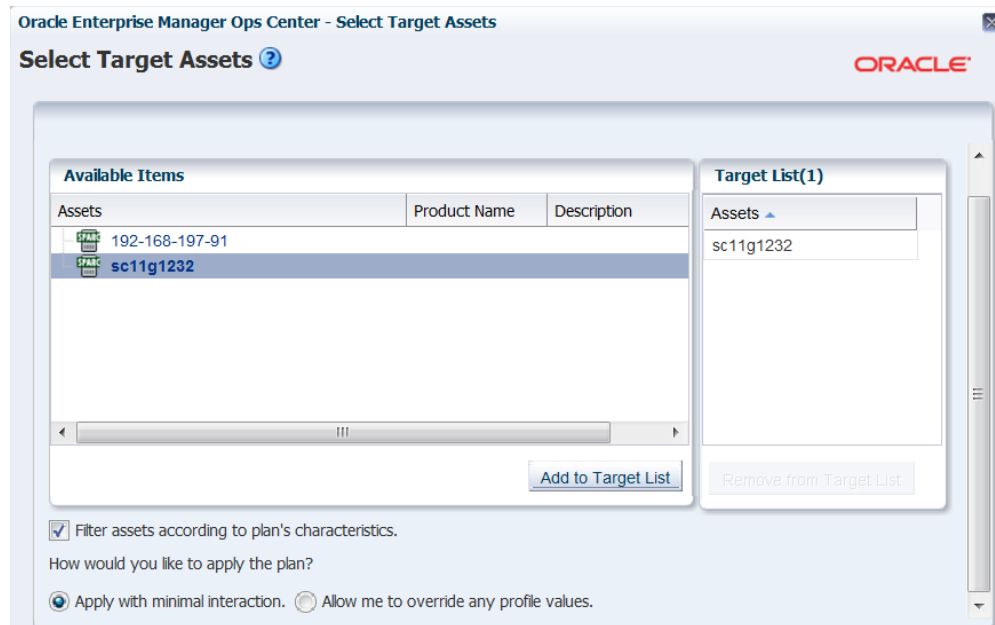
Deploying the Root Domain Plan

Deploy the automatically created root domain plan to create a root domain. The root domain is created without any OS provisioned on it.

To Deploy the Logical Domain Plan

1. Select the **Plan Management** section in the Navigation pane.
2. Expand **Deployment Plans**, then expand **Create Logical Domains**.
3. Select the plan from the list of plans and click **Apply Deployment Plan** in the Actions pane.

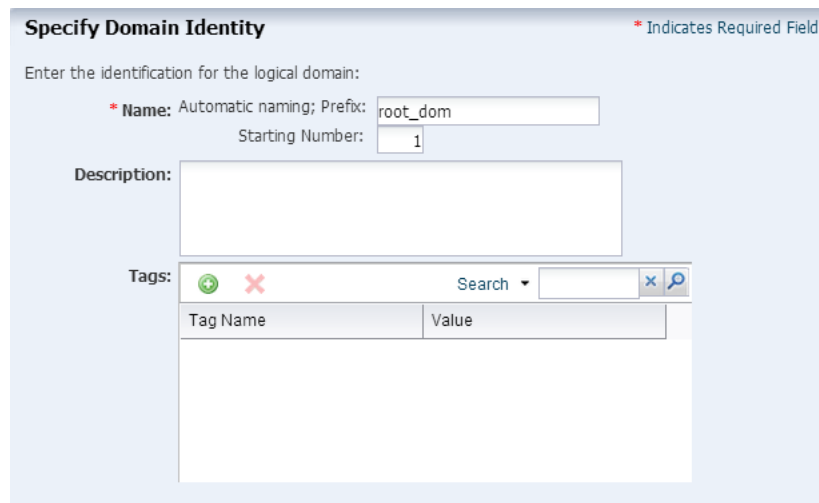
- In the **Select Targets** window, select the Oracle VM Server for SPARC system on which you want to create the root domain.



Click **Add to Target List** to move the selected target Oracle VM Server to the Target List. Select to apply the deployment plan in minimum interaction mode.

Click **Next**.

- The Specify Domain Identity step is displayed. Confirm the given name in the profile and click **Next**.



- Specify the PCIe bus alias for the root domain.

PCIe Buses Assignment

Specify the PCIe buses for the root domains.

Target: sc11g1232

PCIe Buses Assignment for root_dom1		
Bus Type	Alias	Bus name
PCIe	pci_1	pci@500

Click **Next**.

- In the Storage Resource Assignments step, retain the storage library selected for the virtual disks from the profile.

There is only one path to access the backend storage and the multipathing group name is not provided. Therefore, multipathing group is not created for this virtual disk.

The virtual disk server is named as *root_dom1-vds0* by default. If required, you can modify the name of the virtual disk server.

Storage Resource Assignments

Target: sc11g1232

Name of the Virtual Disk Server to be created on the domain:

Virtual Disk/Storage Specification for Logical Domain root_dom1					
Type	Library	LUN/Virtual Disk Name	Volume Group	Multipathing Group	Requi... Size(...)
Local File...	file://guests	root_dom1-vdisk0	-		20

Edit Multipathing For Device root_dom1-vdisk0			
Select	Service Name	Domain Name	Active Path
<input checked="" type="checkbox"/>	primary-vds0	primary	<input checked="" type="checkbox"/>

Click **Next**.

- In the profile to create root domain, the network connections details were not provided. Therefore, the network connection settings step and network resource step are empty.

Specify Network Connections Settings

Specify whether the network connection must be created using virtual function or vnet, and also the tagging mode for networks configured with VLAN ID.

Network connections		
Network	VLAN ID / P-KEY	Mode

Networks Resource Assignments

Specify the network resource for each logical domain.

Target: sc11g1232

Network Specifications for Logical domain root_dom1				
Network	Service Domain	Map connection	VLAN ID / P-KEY	Mode

Click **Next**.

- Schedule the job to run now.

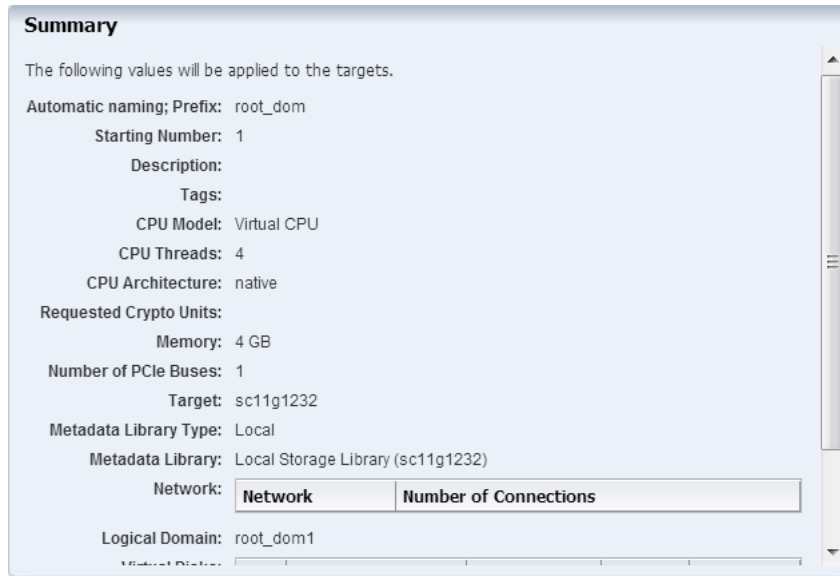
Schedule Job

Select when the job should be scheduled to execute the deployment plan on the selected targets.

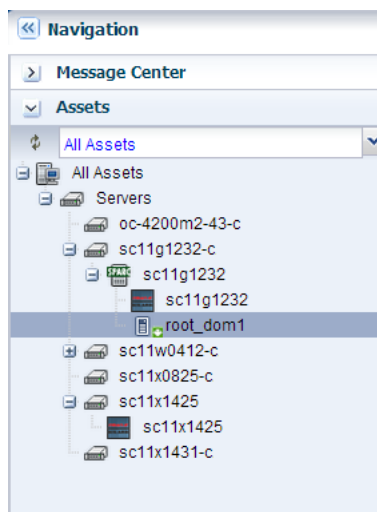
- Now
- At a later date/time

Click **Next**.

- Review the properties and click **Apply** to apply the deployment plan to create logical domain.



The root domain is created and displayed under the corresponding Oracle VM Server for SPARC server:



The root domain is in installing state as the OS is not yet provisioned on it. You can view the **I/O Resources** tab of the root domain in the center pane of Oracle Enterprise Manager Ops Center UI. The PCIe bus is assigned to the root domain. The PCIe slot status will be updated once the OS is provisioned on it.

PCIe/NIU Buses (1)		
Alias	Bus name	Type
pci_1	pci@500	BUS

PCIe Endpoint Devices (6)					
Alias	Device Name	Root Domain	PCIe Bus	PCIe Slot Status	Domain
Ethernet Device (2)					
/SYS/MB/NET2	pci@500/pci@1/pci...	root_dom1	pci_1	-	root_dom1
/SYS/MB/PCIE7	pci@500/pci@1/pci...	root_dom1	pci_1	-	root_dom1
[Unrecognized Device Type] (4)					
/SYS/MB/PCIE1	pci@500/pci@2/pci...	root_dom1	pci_1	-	root_dom1
/SYS/MB/PCIE3	pci@500/pci@2/pci...	root_dom1	pci_1	-	root_dom1
/SYS/MB/PCIE5	pci@500/pci@2/pci...	root_dom1	pci_1	-	root_dom1
/SYS/MB/PCIE9	pci@500/pci@1/pci...	root_dom1	pci_1	-	root_dom1

You can also see in the I/O resources details that there are Ethernet devices available in the /SYS/MB/NET2 and /SYS/MB/PCIE7 slots. You must select these slots while provisioning the OS on the root domain.

If the PCIe Endpoint Ethernet device supports SR-IOV configuration, then the virtual functions are created for the physical function. The virtual functions are created only during OS provisioning. The **SR-IOV Services** are empty for the root domain created:

Physical Functions (PF) (0)					
PF Name	OS datalink name	Service Domain	Number of existing VFs	Max Number of VFs	Max VF MTU
No data					

Creating an OS Provisioning Profile

Create a new OS provisioning profile for the Oracle Solaris 11 OS that must be provisioned on the root domain. You can also edit the default profiles that are created for the Oracle Solaris 11 OS. The procedure in this section describes about creating a new OS provisioning profile.

To Create an OS Provisioning Profile

1. Select the **Plan Management** section in the Navigation pane.
2. Expand **Profiles and Policies** and select **OS Provisioning** profile.
3. Click **Create Profile** in the Actions pane.
The **Create Profile - OS Provisioning** wizard is displayed.
4. Provide the following details for the profile identification:

- Enter the name of the profile as *ldom_guest_osp*.
- Enter a suitable description for the profile.
- Select Logical Domain as the Subtype.

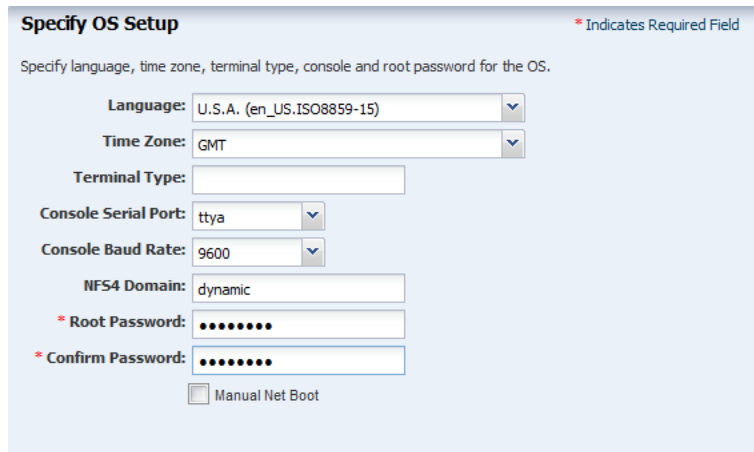
Click **Next** to specify the provisioning parameters.

5. Select the following OSP parameters:
 - Oracle Solaris 11 OS and SRU 13.4.0 from the list.
 - solaris-small-server as the Software Group.

Click **Next** to specify the OS Setup.

6. Specify the OS setup parameters:
 - Enter the time zone, language, terminal type, console serial port, and console baud rate.
 - Enter the root password.

- The NFS4 domain is set to dynamic in this example. If a naming service is configured in your environment, enter the NFS4 domain value.



Specify OS Setup * Indicates Required Field

Specify language, time zone, terminal type, console and root password for the OS.

Language: U.S.A. (en_US.ISO8859-15) [v]

Time Zone: GMT [v]

Terminal Type: []

Console Serial Port: ttya [v]

Console Baud Rate: 9600 [v]

NFS4 Domain: dynamic

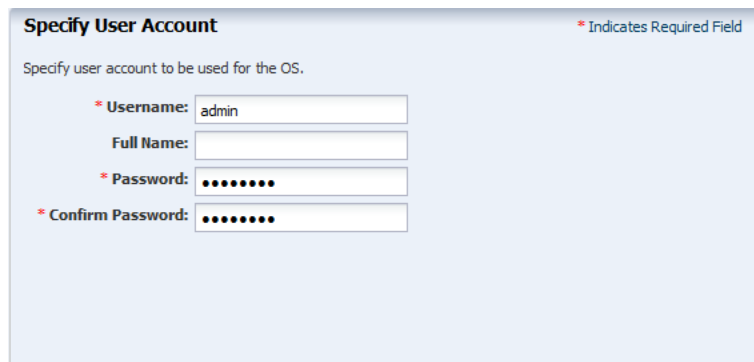
* Root Password: []

* Confirm Password: []

Manual Net Boot

Click **Next**.

7. Create a user account to SSH to the OS after provisioning. Provide a user name and password for the account.



Specify User Account * Indicates Required Field

Specify user account to be used for the OS.

* Username: admin

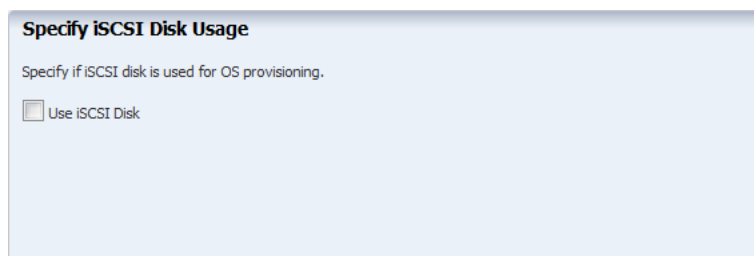
Full Name: []

* Password: []

* Confirm Password: []

Click **Next** to specify whether you want to use iSCSI disks for OS provisioning.

8. Do not select the option to use iSCSI disk as this scenario does not involve the use of iSCSI disk for OS provisioning.



Specify iSCSI Disk Usage

Specify if iSCSI disk is used for OS provisioning.

Use iSCSI Disk

Click **Next**.

9. The root (/) and a swap file system are defined by default. You can change the swap size. Click the **Add** icon to add more ZFS file systems.

UFS File System Type is available when you are provisioning Oracle Solaris 10 1/13 OS.

Specify File System Layout

Specify the file systems that need to be created.

File Systems (2)

File System Type	Mount Point	Device	Size (MB)
swap	swap	rpool	4096
zfs	/	rootdisk.s0	Remaining unused space

NOTE: To allocate the remaining unused disk space to a specific file system, do not enter any value for its size (leave the size field blank).

Click **Next** to specify the name service.

- If you have a naming service in place, select the appropriate one and provide the setup details. In this procedure, select **None** for the naming service.

If you have any naming service in your setup, refer to the help in the wizard or the *Oracle Enterprise Manager Ops Center Feature Reference Guide* for information about specifying the naming services.

Specify Naming Services

* Indicates Required Field

Specify the name service, the domain name, and the corresponding name server.
If the name service is specified, the hostname would be automatically derived from it.
Otherwise, the hostname will be generated by substituting the '.' in the target's IP address with '.'.

Name Service: NONE DNS NIS NIS+ LDAP

Click **Next** to view the summary of the parameters selected for the profile.

- Review the parameters selected for the profile and click **Finish** to create the OS provisioning profile.

Summary

Review the properties of the profile. Click Finish to save the profile.

Name: Idom_guest_osp

Description:

Target Type: VirtualMachine

OS Image: Oracle Solaris 11.0 sparc (SRU 13.4.0) (AI)

Software Group: pkg://solaris/group/system/solaris-small-server

Language: U.S.A. (en_US.ISO8859-15)

Time Zone: GMT

Terminal Type:

Console Serial Port: ttya

Console Baud Rate: 9600

NFS4 Domain: dynamic

Manual Net Boot:

Solaris 11 Update Profile:

Username: admin

Full Name:

Use iSCSI Disk:

File Systems (2)			
File System Type	Mount Point	Device	Size (MB)
			1000

12. Click **Finish** to create the OS provisioning profile.

Creating an OS Configuration Profile

1. Select the **Plan Management** section and expand **Profiles and Policies**.
2. Select **OS Configuration** and click **Create Profile** in the Actions pane.
3. Enter the following details to identify the profile:
 - Name and description of the profile.
 - Select Logical Domain as the Subtype and Virtual Machine as the Target Type.

Identify Profile * Indicates Required Field

* **Name:** Idom_guest_osp

Description:

* **Subtype:** Subtype

- Oracle VM Server for SPARC
- Logical Domain
- Oracle Linux
- Oracle VM Server for x86
- Red Hat Linux
- SUSE Linux
- Solaris
- JET Template

Target Type: Target Type

- VirtualMachine

Click **Next** to set the OS Management properties

4. Select to manage the OS automatically and deploy the Agent Controller to manage the asset.

Select the option **Enable Multiplexed I/O** so that you can associate block storage libraries such as FC and iSCSI for storage with the OS.

Select the option **Enable Single Root I/O Virtualization (SR-IOV)** in the root domain. Starting with the 12.2.2.0.0 release, you can choose to disable SR-IOV to root domains by deselecting this option. Disabling SR-IOV prevents Oracle Enterprise Ops Center to automatically create virtual functions on the root domain.

The screenshot shows the 'OS Management' configuration panel. It includes several options: 'Automatically Manage with Oracle Enterprise Manager Ops Center' (checked), 'Deploy Agent Controller' (selected), and 'Periodically probe the asset. SSH credentials are required, choose from an existing set or create a new set.' Below this is an 'SSH:' field with 'New' and 'Select' buttons. At the bottom, 'Enable Multiplexed I/O (MPxIO)' and 'Enable Single Root I/O Virtualization (SR-IOV)' are both checked.

Click **Next** to specify the networking details.

5. Select **None** as the networking option for the OS.

The screenshot shows the 'Specify Networking' configuration panel. It asks to 'Specify if the OS would need to use IPMP groups or IEEE 802.3ad Link Aggregations.' Three radio buttons are present: 'Use Link Aggregation', 'Use IPMP', and 'None' (which is selected).

Click **Next** to specify the networking details for the OS such as network interface.

6. Enter the number of network interfaces that must be used on the OS. The details of the interfaces are collected while deploying the plan.

The screenshot shows the 'Specify Network Interfaces' configuration panel. It asks to 'Specify the number of network interfaces that you want to use on the OS.' A required field is shown: '* Number of Interfaces: 1'. A legend indicates that the asterisk denotes a required field.

Click **Next** to view the summary of the parameters selected for OS configuration.

7. Review the parameters and click **Finish** to create the OS configuration profile.

Summary

Review the properties of the profile. Click Finish to save the profile.

Name: idom_guest_osc

Description:

Target Type: VirtualMachine

Automatically Manage with
Oracle Enterprise Manager
Ops Center:

Deploy Agent Controller:

Enable Multiplexed I/O
(MPxIO):

Number of Interfaces: 1


Creating a Provision OS Deployment Plan

Create a Provision OS plan that includes the OS Provisioning and OS Configuration profile created in the previous procedures. The provision plan will then be applied on the created root domain.

To Create a Provision OS Plan

1. Select **Plan Management** section in the Navigation pane.
2. Expand **Deployment Plans** and select **Provision OS**.
3. Click **Create Plan from Template** in the Actions pane.
4. In the **Create a Deployment Plan** window, enter the following details:
 - Name of the plan as *my_guest_os*.
 - Description for the plan.
 - Select **Stop at failure** for Failure Policy.
 - Select the **OS Provisioning Profile** and the **OS Configuration Profile** created for provisioning OS on the root domain.

Click **Save** to save the deployment plan.

Create a Deployment Plan 

* Indicates Required

Plan Name: root_dom_os

Description:

Failure Policy: Stop at failure Complete as much as possible

Target Type: Servers

Template Name: Provision OS

Deployment Plan Steps

Step	Profile/Plan Type	Associated Profile/Deployment Plan	Number of Results	Assigned Targets
Provision OS (Required step)	OS Provisioning Profile	ldom_guest_osp v1 (Logical Domain)	0	0
Configure OS (Required step)	OS Configuration Profile	ldom_guest_osc v1 (Logical Domain)	1	-

Applying Provision OS Deployment Plan On Root Domain

For provisioning OS on the root domain, two important parameters are required:

- **Boot interface details:** The details can be either the PCIe slot and the network port number, or the MAC address of the interface.
- **OS Provisioning IP Address:** The IP address that must be used on the OS. If you have more than one interfaces defined to be used on the OS, the network slot and the IP address for each network connection.

In this scenario, the root domain is created first and then the OS provisioning plan is deployed on the root domain. The available PCIe Endpoint devices are filtered and displayed in the boot interface list.

To Deploy the Provision OS Plan on the Root Domain

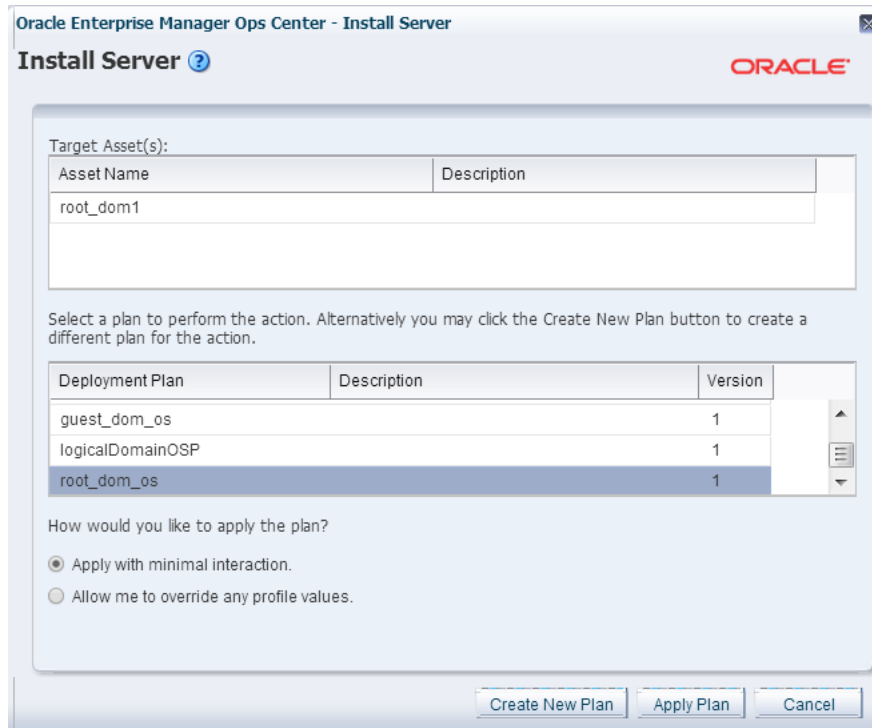
1. Select the root domain in the **Assets** tree of the Navigation pane.

2. Click **Install Server** in the Actions pane.

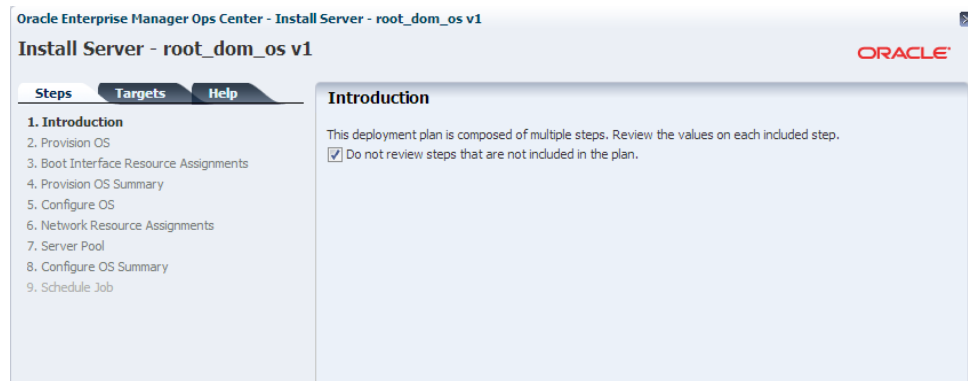
The **Install Server** window is displayed.

3. Select the OS provisioning plan created for deploying the OS and apply the plan in minimal interaction mode.

Click **Apply Plan**.

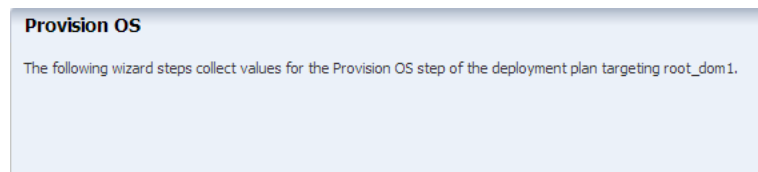


4. The OS deployment wizard is displayed. Select not to review the steps that are not included in the deployment plan.



Click **Next** in the Introduction step.

5. The plan consists of the OS provisioning profile and OS configuration profile. The application of the plan starts with the Provision OS step.



Click **Next** to define the boot interface resources.

6. In the Boot Interface Resource Assignment step, enter the following details:
 - Select a network in the **Network** column. The networks that are discovered and managed in Oracle Enterprise Manager Ops Center are listed.

- Select the PCIe Endpoint device that provides the network interface for the network connection.

In this example, select PCIe7 (pci_1) in the **Controller** column. The controller displays only those devices that are available for network connection. It does not display all the endpoint devices available in the bus.

- Select the interface from the list of interfaces available for that PCIe slot.
- Provide the IP address for the boot interface.
- (Optional) Provide the host name for the target.

Boot Interface Resource Assignments

Review or specify the network resources for the boot interface of each target.

Identify Network Interface by MAC Address

Boot Interfaces					
Target	Network	Controller	Interface	IP	Primary Hostname
root_dom1	192.0.2.0/24.1	PCIe7(pci_1)	net_0	192.0.2.100	

Click **Next**.

7. Review the summary of information for OS provisioning and click **Next**.

Provision OS Summary

Review the values that will be applied to the targets. root_dom1.

OS Image: Oracle Solaris 11.0 sparc (SRU 13.4.0) (AI)

Software Group: pkg://solaris/group/system/solaris-small-server

Language: U.S.A. (en_US.ISO8859-15)

Time Zone: GMT

Terminal Type:

Console Serial Port: ttya

Console Baud Rate: 9600

NFS4 Domain: dynamic

Manual Net Boot:

Solaris 11 Update Profile:

Username: admin

Full Name:

Use iSCSI Disk:

File Systems (2)			
File System Type	Mount Point	Device	Size (MB)

Click **Next**.

8. The application of the OS configuration profile starts in the wizard.

Configure OS

The following wizard steps collect values for the Configure OS step of the deployment plan targeting root_dom1.

Click **Next**.

9. The boot interface network details are populated in this step. In this example, there was only one network interface selected to be configured on the OS. Therefore, the network resource is populated with the boot interface network details.

If you have selected more than one interface to be configured on the OS, the first interface is always overwritten by the boot interface network details. Always define the first interface as the boot interface. You can select the interface that you want to be the primary interface. Specify the network resources for the selected interfaces:

- Select the network in the **Network** column.
- Select the PCIe Endpoint device in the **Controller** column. The PCIe Endpoint device provides the network interface for communication.
- Select the network interface.
- Enter the IP address for OS provisioning.
- Select the primary interface.

Network Resource Assignments

Review or specify the network resources for each target.

Target: root_dom1

Network Interfaces (1)				
Network	Controller	Interface	IP	Primary
192.0.2.0/24.1	PCIe7(pci_1)	net_0	192.0.2.100	<input checked="" type="radio"/>

Click **Next**.

10. In this example, the OS is not placed in a server pool for zones.

Server Pool

The server that will be installed can be assigned to a Solaris Container SPARC Server Pool. Select an assignment choice:

- Do not assign to a Server Pool. The new server will execute in stand-alone mode. You may add the server to a pool at a later time.
- Assign to a compatible Server Pool.
- Create a new Server Pool based on the attributes of the new server and assign the server, using default pool settings. The pool settings can be changed later after it has been created.

Click **Next**.

11. Review the summary of OS configuration parameters and click **Next**.

Configure OS Summary

Review the values that will be applied to the targets. root_dom1.

Automatically Manage with Oracle Enterprise Manager Ops Center:

Deploy Agent Controller:

Enable Multiplexed I/O (MPxIO):

Target: root_dom1

Network Interfaces (1)				
Network	Controller	Interface	IP	Primary
192.0.2.0/24.1	PCIE7(pci_1)	net_0	192.0.2.100	<input checked="" type="radio"/>

Server Pool: Do not assign to a Server Pool.

12. Schedule the job to run now and click **Apply**.

Schedule Job

Select when the job should be scheduled to execute the deployment plan on the selected targets.

Now

At a later date/time

Execute the provisioning job on the root domain. The OS is provisioned and it is displayed in the UI:

The screenshot shows the Oracle Enterprise Manager navigation pane. The 'Assets' section is expanded to show a tree view of servers. The 'root_dom1' server is highlighted, indicating it has been successfully provisioned. The IP address 192-0-2-100 is visible next to the root_dom1 entry.

You can now view the **I/O Resources** tab of the root domain that displays the complete details of the PCIe slot status.

The screenshot shows the 'root_dom1' management interface. The 'I/O Resources' tab is active, and the 'SR-IOV Services' sub-tab is selected. The 'PCie/NIU Buses (1)' section contains a table with one entry:

Alias	Bus name	Type
pci_1	pci@500	BUS

The 'PCie Endpoint Devices (6)' section is expanded to show 'Ethernet Device (2)' and '[Unrecognized Device Type] (4)'. The Ethernet devices are:

Alias	Device Name	Root Domain	PCie Bus	PCie Slot Status	Domain
/SYS/MB/NET2 (Sub...)	pci@500/pci@1/pci...	root_dom1	pci_1	Occupied	root_dom1
/SYS/MB/PCIE7 (Sub...)	pci@500/pci@1/pci...	root_dom1	pci_1	Occupied	root_dom1

The unrecognized devices are:

Alias	Device Name	Root Domain	PCie Bus	PCie Slot Status	Domain
/SYS/MB/PCIE1	pci@500/pci@2/pci...	root_dom1	pci_1	Empty	root_dom1
/SYS/MB/PCIE3	pci@500/pci@2/pci...	root_dom1	pci_1	Empty	root_dom1
/SYS/MB/PCIE5	pci@500/pci@2/pci...	root_dom1	pci_1	Empty	root_dom1
/SYS/MB/PCIE9	pci@500/pci@1/pci...	root_dom1	pci_1	Empty	root_dom1

For the SR-IOV enabled network interfaces, the virtual functions are created. In this scenario, the /SYS/MB/NET2 is SR-IOV enabled network interface. Therefore, the virtual functions were created for the two physical functions:

The screenshot shows the 'root_dom1' management interface. The 'I/O Resources' tab is active, and the 'SR-IOV Services' sub-tab is selected. The 'Physical Functions (PF) (2)' section contains a table with two entries:

PF Name	OS datalink name	Service Domain	Number of existing VFs	Max Number of VFs
/SYS/MB/NET2/IOVNET.PF0	net0	root_dom1	7	8
/SYS/MB/NET2/IOVNET.PF1	net1	root_dom1	7	8

The '/SYS/MB/NET2/IOVNET.PF0 Virtual Functions (VF) (7)' section contains a table with seven entries:

VF Name	Domain	MAC Address	Alternate MAC Addresses	MTU
/SYS/MB/NET2/IO...	-	00:14:4F:FB:A9:AA	-	1500
/SYS/MB/NET2/IO...	-	00:14:4F:F9:9C:42	-	1500
/SYS/MB/NET2/IO...	-	00:14:4F:FA:62:4B	-	1500
/SYS/MB/NET2/IO...	-	00:14:4F:F8:27:68	-	1500
/SYS/MB/NET2/IO...	-	00:14:4F:F8:01:E8	-	1500
/SYS/MB/NET2/IO...	-	00:14:4F:F8:8C:A2	-	1500
/SYS/MB/NET2/IO...	-	00:14:4F:F8:A8:A6	-	1500

For any reason, if you want to delete the root domain, starting with the 12.2.2.0.0 release you can use the **Delete** action to delete root domains if other domains are not using a virtual function from the root domain. For previous releases, if you want to delete the root domain that have virtual functions, then you must delete all the virtual functions created on the SR-IOV enabled PCIe devices before proceeding to delete the domain, all virtual functions must be deleted manually from the command line prompt of the control domain.

What's Next?

You can release the PCIe Endpoint Devices of the root domain, so that you can create I/O domains. Or, you can provide virtual I/O resources services to the other guest domains in the server.

Related Articles and Resources

The Oracle Enterprise Manager Ops Center 12c documentation is located at http://docs.oracle.com/cd/E40871_01/index.htm.

Refer to the following resources for more information:

- *Oracle Enterprise Manager Ops Center Feature Reference Guide*
- *Oracle Enterprise Manager Ops Center Administration Guide*

See <http://www.oracle.com/technetwork/documentation/vm-sparc-194287.html> for Oracle VM Server for SPARC documentation.

See the Operate How To available at http://docs.oracle.com/cd/E40871_01/nav/operatehowto.htm.

See the Deploy How To available at http://docs.oracle.com/cd/E40871_01/nav/deployhowto.htm.

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Oracle Enterprise Manager Ops Center Configuring and Installing Root Domains, 12c Release 2 (12.2.2.0.0)
E50416-03

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