

**Oracle® Communications**  
**Diameter Signaling Router**

Cloud Installation Guide

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Oracle Communications Diameter Signaling Router Cloud Installation Guide, Release 8.5.0.1

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See more information on My Oracle Support (MOS) in Appendix K.

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## 1. Introduction

This document installs the Diameter Signaling Router (DSR) 8.5.0.X and compatible IDIH applications on a supported Cloud platform.

This document assumes platform-related configuration has already been done.

The audience for this document includes Oracle customers as well as these groups: Software System, Product Verification, Documentation, and Customer Service including Software Operations and First Office Application.

### 1.1 References

- [1] Communication Agent Configuration Guide
- [2] DSR PCA Activation Guide
- [3] DSR Meta Administration Feature Activation Procedure
- [4] DSR Full Address Based Resolution (FABR) Feature Activation Procedure
- [5] DSR Range Based Address Resolution (RBAR) Feature Activation
- [6] SDS SW Installation and Configuration Guide
- [7] Operations, Administration, and Maintenance (OAM) User's Guide
- [8] Communication Agent User's Guide
- [9] Diameter User's Guide
- [10] Mediation User's Guide
- [11] Range Based Address Resolution (RBAR) User's Guide
- [12] Full Address Based Resolution (FABR) User's Guide
- [13] IP Front End (IPFE) User's Guide
- [14] DSR Alarms and KPIs Reference
- [15] Measurements Reference
- [16] Diameter Common User's Guide
- [17] DSR Security Guide
- [18] DSR IPv6 Migration Guide
- [19] DSR DTLS Feature Activation Procedure
- [20] DSR RADIUS Shared Secret Encryption Key Revocation MOP MO008572
- [21] DCA Framework and Application Activation and Deactivation Guide
- [22] Oracle VM Concepts Guide, Release 3.4
- [23] Networking v2.0 API documentation
- [24] DSR Cloud Benchmarking Guide
- [25] DSR Cloud Upgrade Guide



## 1.2 Acronyms

An alphabetized list of acronyms used in the document.

**Table 1. Acronyms**

<b>Acronym</b>	<b>Definition</b>
CD	Compact Disk
DA-MP	Diameter Agent Message Processor
DSCP	Differentiated Services Code Point
DSR	Diameter Signaling Router
ESXi	Elastic Sky X Integrated
FABR	Full Address Based Resolution
iDIH	Integrated Diameter Intelligence Hub
IPFE	IP Front End
KVM	Kernel-based Virtual Machine
MP	Message Processor
NAPD	Network Architecture Planning Diagram
NE	Network Element
NOAM	Network Operation Administration and Maintenance
OS	Operating System (for example, TPD)
OVA	Open Virtualization Archive
OVM-M	Oracle VM Manager
OVM-S	Oracle VM Server
PDRA	Policy Diameter Routing Agent
PCA	Policy and Charging Application
RBAR	Range Based Address Resolution
SAN	Storage Area Network
SFTP	Secure File Transfer Protocol
SNMP	Simple Network Management Protocol
SOAM	Software Operation Administration and Maintenance
SSO	Single Sign On
TPD	Tekelec Platform Distribution
TSA	Target Set Address
VIP	Virtual IP
VM	Virtual Machine
vSTP	Virtual Signaling Transfer Point

### 1.3 Terminology

Multiple server types may be involved with the procedures in this manual. Therefore, most steps in the written procedures begin with the name or type of server to which the step applies.

**Table 2. Terminology**

Term	Definition
Site	<p>Applicable for various applications, a site is type of <b>place</b>. A place is configured object that allows servers to be associated with a physical location.</p> <p>A site place allows servers to be associated with a physical site. For example, sites may be configured for Atlanta, Charlotte, and Chicago. Every server is associated with exactly one site when the server is configured.</p> <p>For the Policy and Charging DRA application, when configuring a site, only put DA-MPs and SBR MP servers in the site. Do not add NOAM, SOAM, or IPFE MPs to a site.</p>
Place Association	<p>Applicable for various applications, a <b>Place Association</b> is a configured object that allows places to be grouped together. A place can be a member of more than one place association.</p> <p>The Policy and Charging DRA application defines two place association types: policy binding region and Policy and Charging mated sites.</p>
Policy and Charging SBR Server Group Redundancy	<p>The Policy and Charging application uses SBR server groups to store the application data. The SBR server groups support both two and three site redundancy. The server group function name is <b>Policy and Charging SBR</b>.</p>
Server Group Primary Site	<p>A server group primary site is a term used to represent the principle location within a SOAM or SBR server group. SOAM and SBR server groups are intended to span several sites (places). For the Policy and Charging DRA application, these sites (places) are all configured within a single <b>Policy and Charging Mated Sites</b> place association.</p> <p>For the Diameter custom application, these sites (places) are configured in <b>Applications Region</b> place association.</p> <p>The primary site may be in a different site (place) for each configured SOAM or SBR server group.</p> <p>A primary site is described as the location in which the active and standby servers to reside; however, there cannot be any preferred spare servers within this location. All SOAM and SBR server groups have a primary site.</p>
Server Group Secondary Site	<p>A server group secondary site is a term used to represent location in addition to the Primary Site within a SOAM or SBR Server Group. SOAM and SBR server groups are intended to span several sites (places). For the Policy and Charging DRA application, these sites (places) are all configured within a single <b>Policy and Charging Mated Sites</b> place association.</p> <p>For the Diameter custom application, these sites (places) are configured in <b>Applications Region</b> place association.</p> <p>The secondary site may be in a different sites (places) for each configured SOAM or SBR server group.</p> <p>A secondary site is described as the location in which only preferred spare servers reside. The active and standby servers cannot reside within this location. If two site redundancy is wanted, a secondary site is required for all SOAM and SBR server groups.</p>

Term	Definition
Session Binding Repository Server Group Redundancy	The DCA application may use SBR server groups to store application session data. The SBR server groups support both two and three site redundancy. The server group function name is <b>Session and Binding Repository</b> .
Two Site Redundancy	Two site redundancy is a data durability configuration in which Policy and Charging data is unaffected by the loss of one site in a Policy and Charging Mated Sites Place Association containing two sites.  Two site redundancy is a feature provided by server group configuration. This feature provides geographic redundancy. Some server groups can be configured with servers located in two geographically separate sites (locations). This feature ensures there is always a functioning active server in a server group even if all the servers in a single site fail.

## 2. Installation Overview

This section provides a brief overview of the recommended methods for installing the source release software that is installed and running on a Cloud to the target release software.

### 2.1 Required Materials

1. One target release DSR OVA Media
2. Three (3) iDIH OVA (Optional iDIH)
  - a. iDIH Application OVA
  - b. iDIH Oracle OVA
  - c. iDIH Mediation OVA

### 2.2 Installation Overview

This section describes the overall strategy to employ for a single or multi-site DSR and iDIH installation. It also lists the procedures required for installation with estimated times. Section 2.2.1 discusses the overall installation strategy and includes an installation flowchart to determine exactly which procedures should be run for an installation. Section 2.2.3 lists the steps required to install a DSR system. The later sections expand on the information from the matrix and provide a general timeline for the installation.

Additionally, basic firewall port information is included in Appendix F Firewall Ports. It should also be noted that some procedures are cloud platform dependent and not all procedures are performed on all cloud platforms.

#### 2.2.1 Installation Strategy

A successful installation of DSR requires careful planning and assessment of all configuration materials and installation variables.

1. An overall installation requirement is decided upon. The following data are collected:
  - The total number of sites
  - The number of virtual machines at each site and their role(s)
  - What time zone should be used across the entire collection of DSR sites?
  - Will SNMP traps be viewed at the NOAM or will an external NMS be used? (Or both?)

2. A site survey (NAPD) is conducted with the customer to determine exact networking and site details.

**Note:** XMI and IMI addresses are difficult to change once configured. It is **very important these addresses are well planned and not expected to change after a site is installed.**

DSR currently supports the following installation strategies:

- DSR installation without using HEAT templates

[Figure 1] illustrates the overall process that each DSR installation involves. In summary, this involves creation of guests and configures each guest role based on Resource Profile and Configure Network.

- DSR installation using HEAT templates (OpenStack only)

[Figure 2] illustrates the overall process that each DSR installation involves using the Heat Templates. In summary, this involves creation of parameter files, environment files, template files, DSR Topology Configuration xml and deploys DSR using open stack CLI commands.

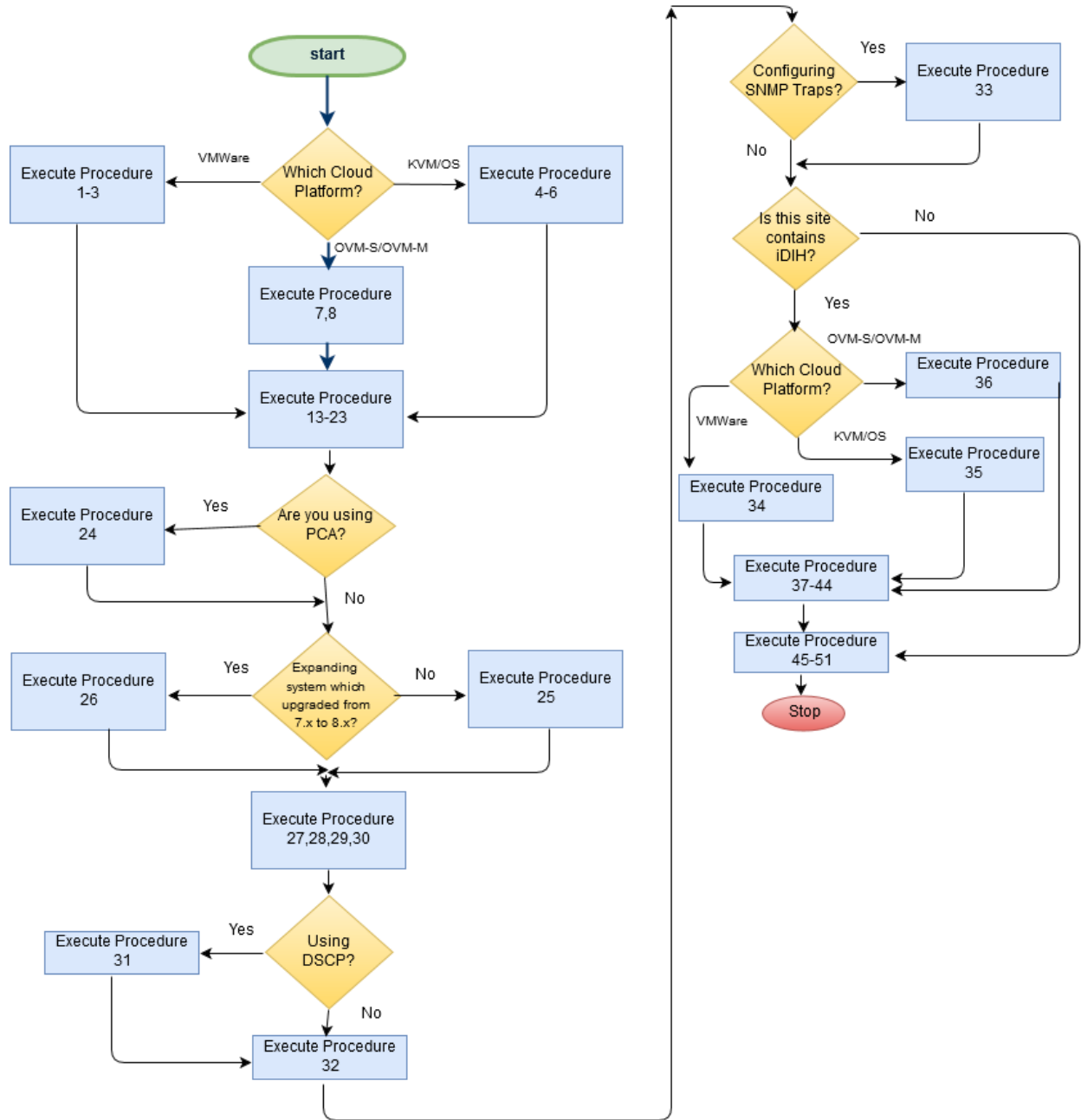
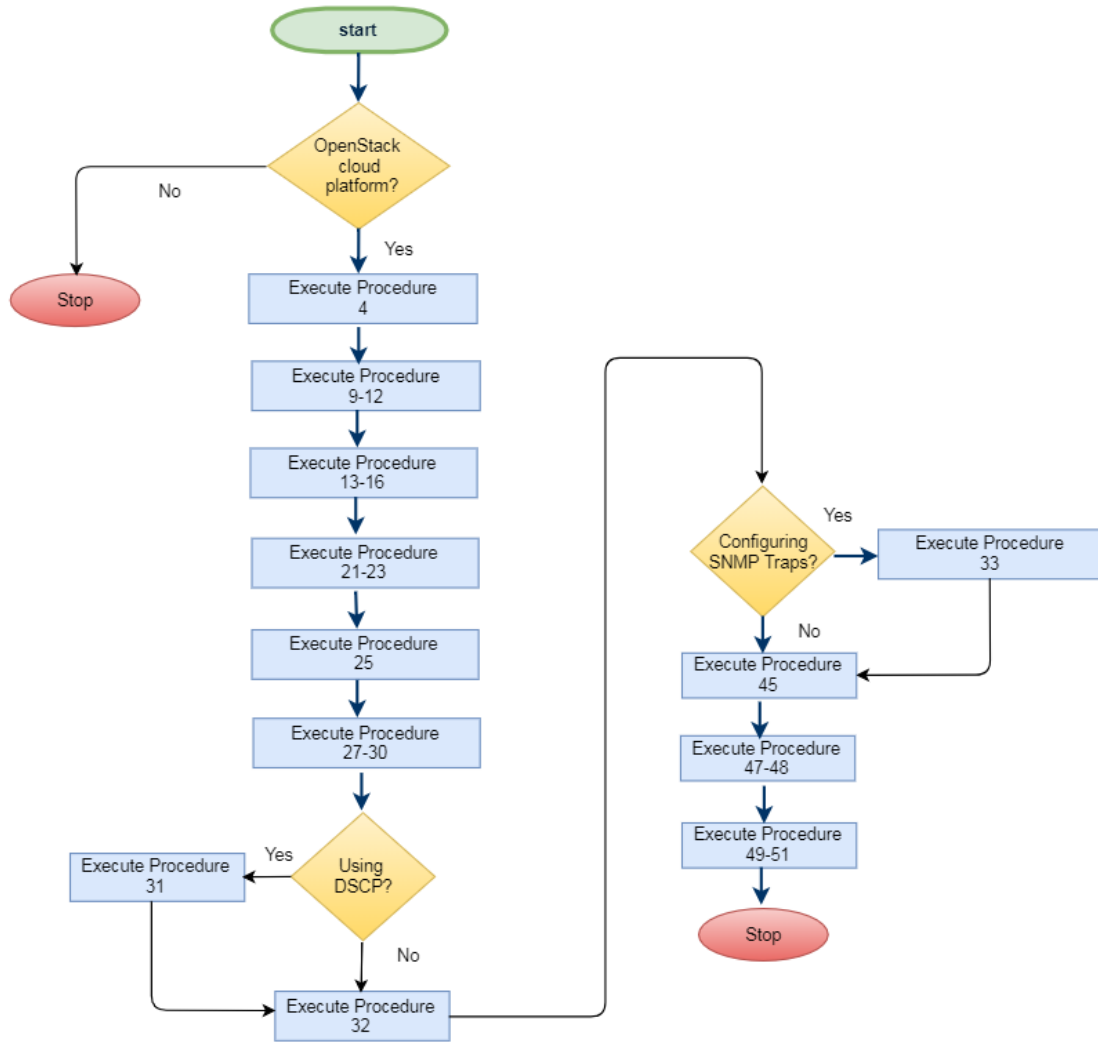


Figure 1: DSR Single Site Installation Procedure Map Without Using HEAT Templates



**Figure 2: DSR Installation Procedure Map Using HEAT Templates**

### 2.2.2 SNMP Configuration

The network-wide plan for SNMP configuration should be decided upon before DSR installation proceeds. This section provides some recommendations for these decisions.

SNMP traps can originate from DSR Application Servers (NOAM, SOAM, MPs of all types) in a DSR installation.

DSR application servers can be configured to:

1. Send all their SNMP traps to the NOAM by merging from their local SOAM. All traps terminate at the NOAM and are viewable from the NOAM GUI (entire network) and the SOAM GUI (site specific). Traps are displayed on the GUI both as alarms and logged in trap history. **This is the default configuration option and no changes are required for this to take effect.**
2. Send all their SNMP traps to an external Network Management Station (NMS). The traps are seen at the SOAM and/or NOAM as alarms **AND** they are viewable at the configured NMS(s) as traps.

Application server SNMP configuration is done from the NOAM GUI near the end of DSR installation. See the procedure list for details.

## 2.2.3 Installation Procedures

The following table illustrates the progression of the installation process by procedure with estimated times. The estimated times and the phases that must be completed may vary due to differences in typing ability and system configuration. The phases outlined are to be executed in the order they are listed.

- If installation strategy is **Install DSR without using HEAT templates**, then follow Table 3.
- If installation strategy is **Install DSR using HEAT templates**, then follow Table 4.

**Table 3. Installation Overview Without Using HEAT Templates**

Procedure	Phase	Elapsed Time (Minutes)	
		This Step	Cum.
Procedure 3 or Procedure 4 or Procedure 9	Import DSR OVA	5	5
Procedure 4 or Procedure 7	Configure DSR NOAM guest role based on resource profile	10	15
Procedure 5 or Procedure 8	Configure DSR remaining guests role based on resource profile	40	55
Procedure 17	Configure the First NOAM NE and Server	25	80
Procedure 18	Configure the NOAM Server Group	15	95
Procedure 19	Configure the Second NOAM Server	15	110
Procedure 20	Complete Configuring the NOAM Server Group	10	120
Procedure 21 (Optional)	Configure the DR NOAM NE and Server (Optional)	25	145
Procedure 22 (Optional)	Configure the DR NOAM Server Group (Optional)	15	160
Procedure 23 (Optional)	Configure the Second DR NOAM Server (Optional)	15	175
Procedure 24 (Optional)	Complete Configuring the DR NOAM Server Group (Optional)	10	185
Procedure 25	Configure the SOAM NE	15	200
Procedure 26	Configure the SOAM Servers	10	210
Procedure 27	Configure the SOAM Server Group	10	220
Procedure 28	Activate PCA/DCA (PCA/DCA Only)	10	230
Procedure 29	Configure the MP Virtual Machines	5	235
Procedure 30	Configure Places and Assign MP Servers to Places (PCA and DCA Only)	10	255
Procedure 31	Configure the MP Server Group(s) and Profiles	5	260
Procedure 32	Configure the Signaling Network Routes	20	290
Procedure 33 (Optional)	Configure DSCP Values for Outgoing Traffic (Optional)	5	295
Procedure 34	IP Front End (IPFE) Configuration	45	340
Procedure 35 (Optional)	Configure SNMP Trap Receiver(s) (Optional)	15	355

Procedure	Phase	Elapsed Time (Minutes)	
		This Step	Cum.
Procedure 36	(VMware only) Create iDIH Oracle, Mediation, and Application VMs (Optional)	10	365
Procedure 37	(KVM/OpenStack Only) Create iDIH Oracle, Mediation, and Application VMs (Optional)	10	375
Procedure 38	(OVM-S/OVM-M). Import Three iDIH OVAs and Create and Configure a VM for Each	10	385
Procedure 39 (Optional)	Configure iDIH VM Networks (Optional)	10	395
Procedure 45 (Optional)	Run Post Installation Scripts on iDIH VMs (Optional)	25	420
Procedure 46 (Optional)	Configure DSR Reference Data Synchronization for iDIH (Optional)	30	450
Procedure 47 (Optional)	iDIH Configuration: Configuring the SSO Domain (Optional)	10	460
Procedure 48 (Optional)	Integrate iDIH into DSR (Optional)	10	470
Procedure 49 (Optional)	iDIH Configuration: Configure the Mail Server (Optional)	10	480
Procedure 50	iDIH Configuration: Configure SNMP Management Server (Optional)	20	500
Procedure 51 (Optional)	iDIH Configuration: Change Network Interface (Optional)	30	530
Procedure 52	Configure ComAgent Connections	15	545
Procedure 53	Complete PCA Configuration (Optional)	5	550
Procedure 54	Backups and Disaster Prevention	15	565
Procedure 55	(KVM/OpenStack Only) Configure Port Security	10	575
Procedure 56	Enable/Disable DTLS (SCTP Diameter Connections Only)	10	585
Procedure 57	Shared Secret Encryption Key Revocation (RADIUS Only)	10	595
Procedure 58	DSR Performance Tuning	10	600

**Note:** Refer section 3 Software Installation Procedure for detailed procedures.



**Table 4: Installation Procedures Using HEAT Templates**

Procedure	Phase	Elapsed Time (Minutes)	
		This Step	Cum.
Procedure 6	Import DSR OVA	5	5
Procedure 14	Create OpenStack Parameter File for NOAM	10	15
Procedure 15	Create OpenStack Parameter File for Signaling	15	30
Procedure 16	Deploy HEAT Templates	15	45
Procedure 17	Configure the First NOAM NE and Server	10	55
Procedure 18	Configure the NOAM Server Group	25	80
Procedure 19	Configure the Second NOAM Server	15	95
Procedure 20	Complete Configuring the NOAM Server Group	15	110
Procedure 25	Configure the SOAM NE	10	120
Procedure 26	Configure the SOAM Servers	15	135
Procedure 27	Configure the SOAM Server Group	10	145
Procedure 28	Activate PCA/DCA (PCA/DCA Only)	10	155
Procedure 29	Configure the MP Virtual Machines	5	160
Procedure 30	Configure Places and Assign MP Servers to Places (PCA and DCA Only) <b>Error! Reference source not found.</b>	10	170
Procedure 31	Configure the MP Server Group(s) and Profiles	5	175
Procedure 32	Configure the Signaling Network Routes	20	205
Procedure 33 (Optional)	Configure DSCP Values for Outgoing Traffic (Optional)	5	210
Procedure 34	IP Front End (IPFE) Configuration	15	225
Procedure 35 (Optional)	Configure SNMP Trap Receiver(s) (Optional)	15	240
Procedure 52	Configure ComAgent Connections	20	260
Procedure 54	Backups and Disaster Prevention	15	275
Procedure 55	(KVM/OpenStack Only) Configure Port Security	30	305
Procedure 56	Enable/Disable DTLS (SCTP Diameter Connections Only)	15	320
Procedure 57	Shared Secret Encryption Key Revocation (RADIUS Only)	10	330
Procedure 58	DSR Performance Tuning	10	340

**Note:** Refer section 0

## 2.3 DSR Installation on OL7 and KVM

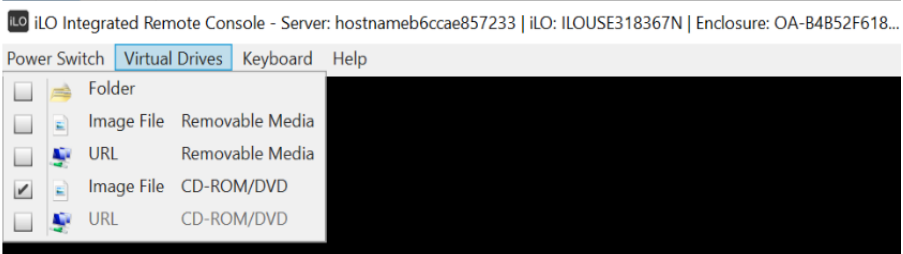
DSR Installation on OL7 and KVM includes the following procedures:

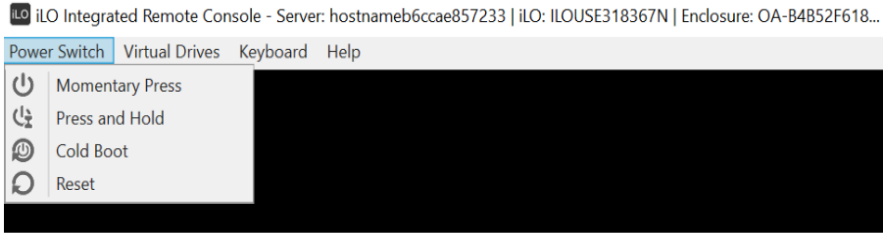
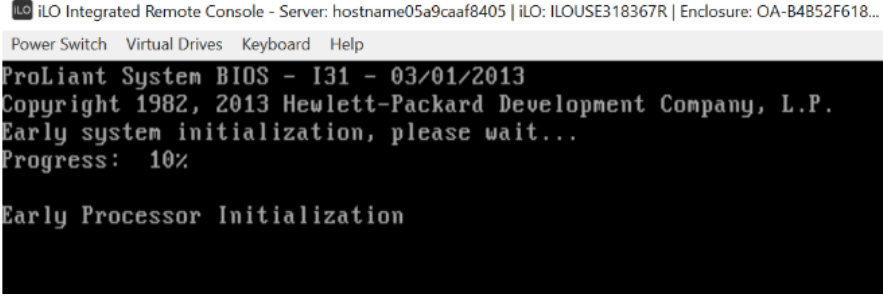

- Install DSR on Oracle Linux/KVM
- Create and Install OCDSR VMs via KVM GUI

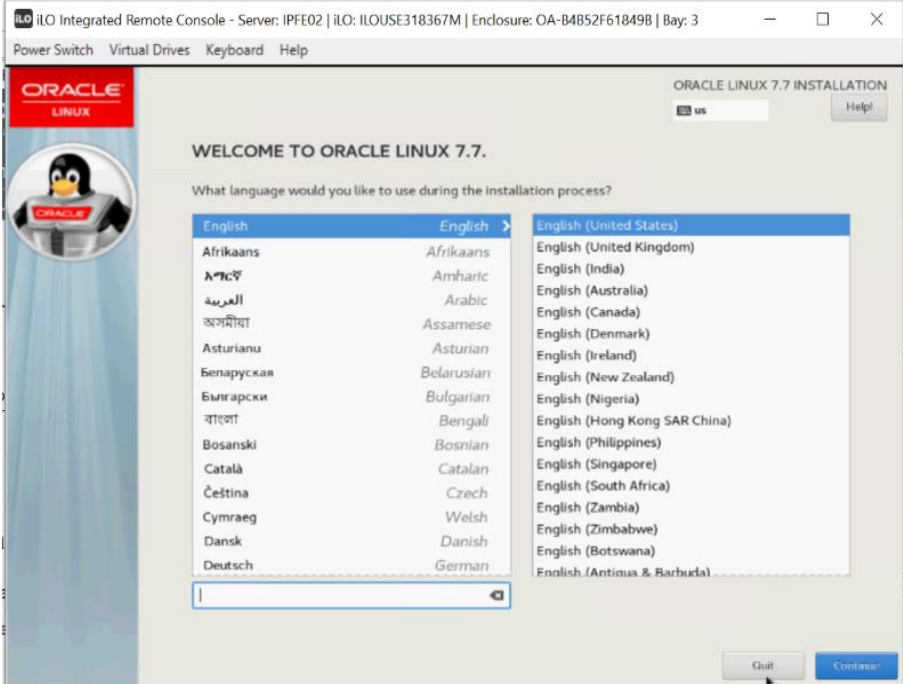
**Note:** If using a hardware in remote LAB then use a remote windows machine to install Linux. Please ensure that OEL 7 ISO is also located locally in remote windows machine.

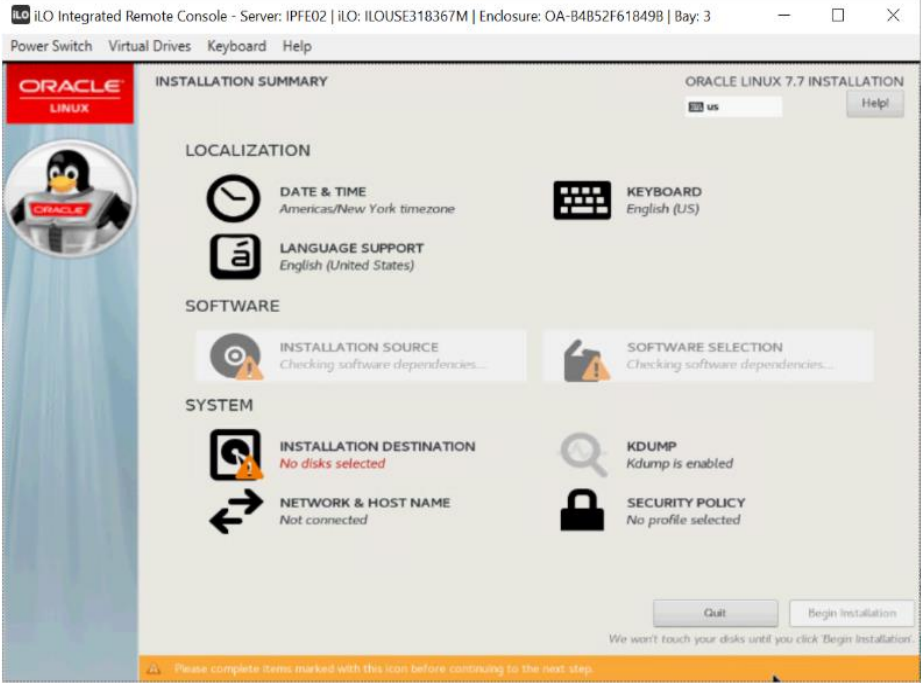
### 2.3.1 DSR Installation on OL7 and KVM

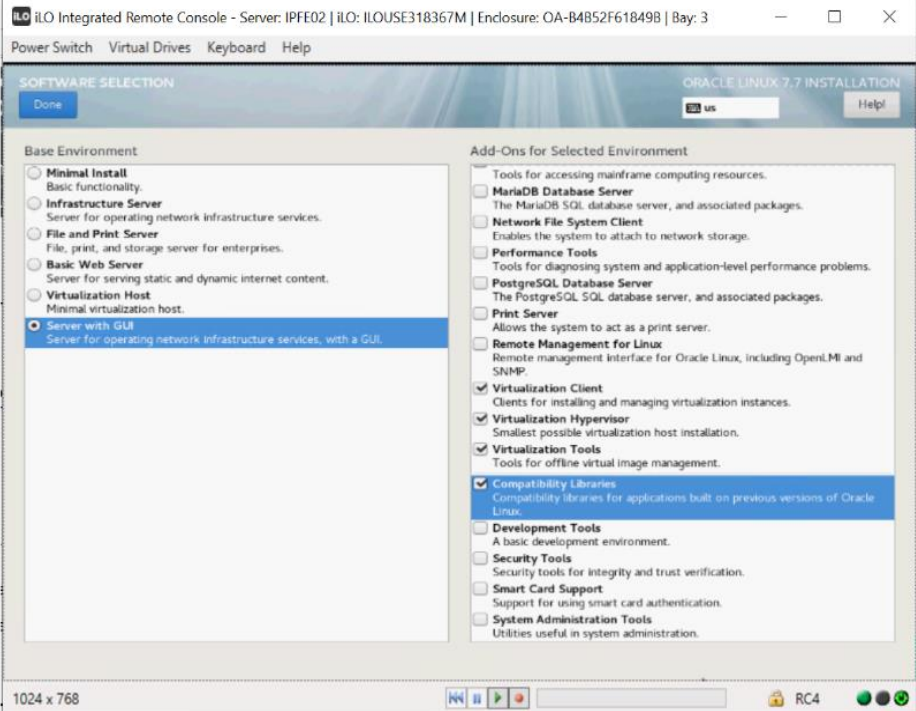
#### Procedure 1. Install DSR on Oracle Linux/KVM

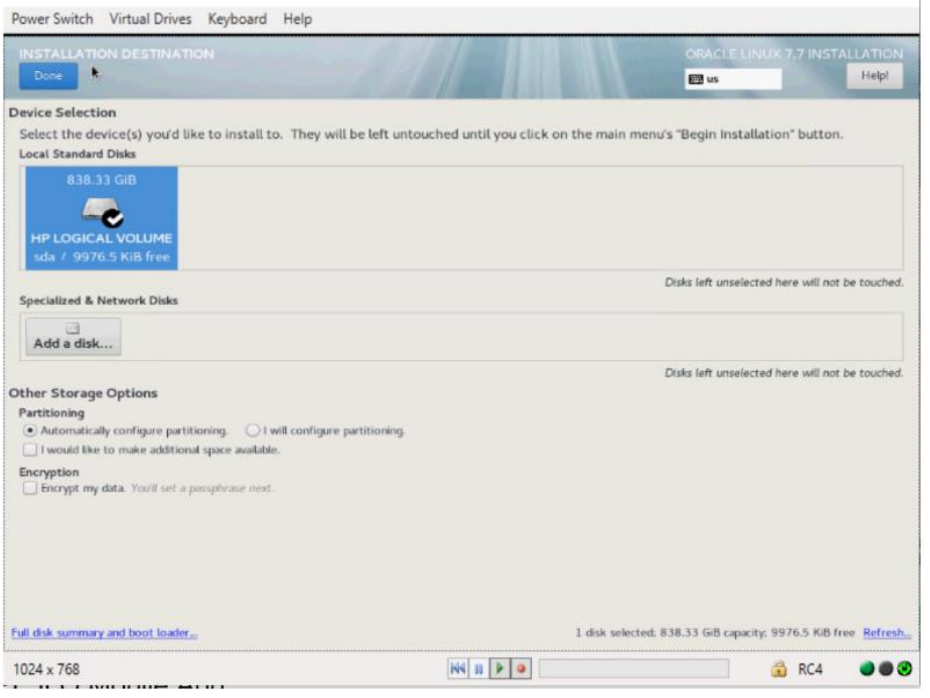
STEP #	Procedure	Description
<p>This procedure will install DSR configuration on Oracle Linux OS with direct KVM as hypervisor.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• This installation procedure only applies when installing DSR on Oracle Linux OS via direct KVM</li> <li>• For the Oracle Linux OS, Oracle Linux 7.7 release is used and verified OK.</li> <li>• The snapshot used for this procedure has been taken from HP Gen-10 Blade.</li> <li>• This procedure can be executed on any flavor of blade that require DSR install on OL7.7 and KVM.</li> </ul> <p><b>Prerequisite:</b> All the respective infrastructures has to be up and running.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	<p>For each <b>Blade:</b></p> <p>Mount virtual media contains Oracle Linux OS software</p>	<p>Follow steps defined in Mounting Virtual Media on Blade:</p> <ul style="list-style-type: none"> <li>• Open the ILO.</li> <li>• Attach the OEL 7.7 ISO in ILOs virtual drives-&gt;Image File CD/DVD ROM.</li> </ul> <p>To mount the Oracle Linux OS software ISO from ILO GUI:</p> <ul style="list-style-type: none"> <li>• Navigate to <b>Virtual drives -&gt; menu,</b></li> <li>• Click on <b>Image File</b> then select image from folder.</li> </ul> 
2. <input type="checkbox"/>	<p>For each <b>Blade:</b></p> <p>Reboot host</p> <p>Login to Blade Server</p>	<p>To reboot host:</p> <p>Click <b>Power Switch</b> and select <b>Reset</b> from the dropdown menu.</p>

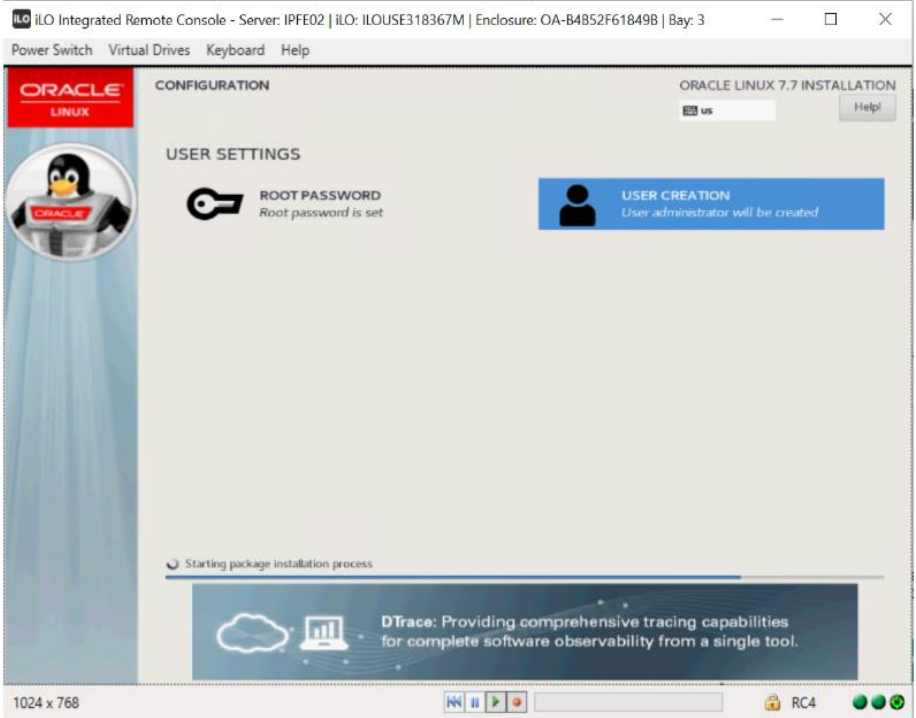
STEP #	Procedure	Description
	<p>ILO GUI browser page and launch remote console</p>	 <p>The remote console window displays that the host is rebooting.</p>  <p>Wait for a couple of minutes for reboot to complete.</p>
<p>3. <input type="checkbox"/></p>	<p>For each Blade:</p> <p>Initiate Oracle Linux Platform installation</p>	<p>Once reboot completes, the host boots with Oracle Linux installation ISO and the GUI screen prompts for the installation options.</p> 

STEP #	Procedure	Description
		Select <b>Install Oracle Linux 7.x</b> to continue.
<p>4.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Choose Oracle Linux OS language</p>	<p>When prompted, select <b>English</b> as Oracle Linux OS language:</p>  <p>Press <b>Continue</b> to go to next step.</p>
<p>5.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Setup time zone</p>	<p>The next page <b>INSTALLATION SUMMARY</b> displays the required information to start installation.</p>

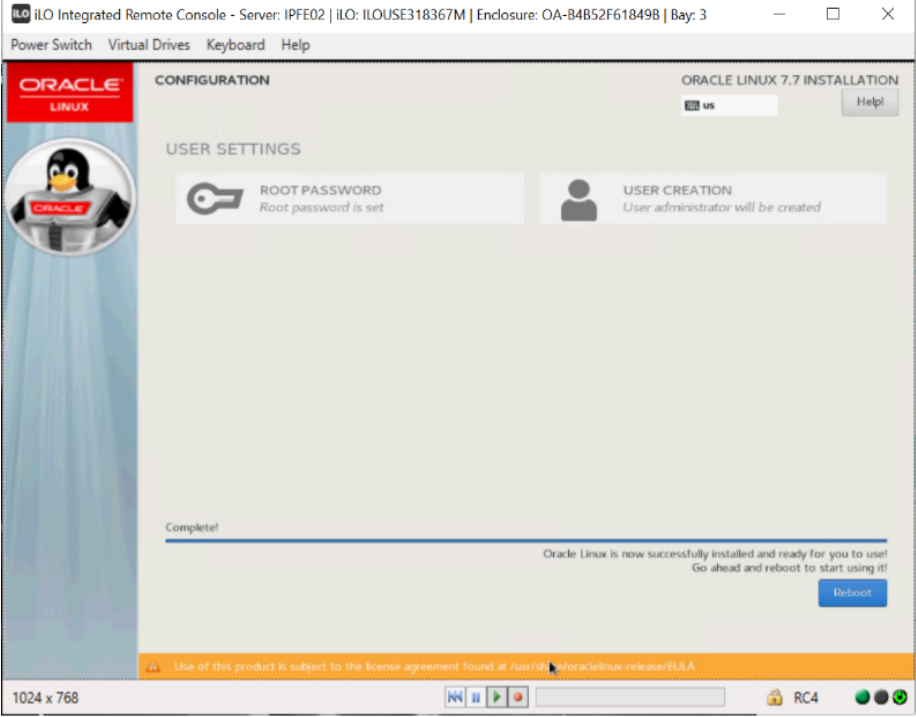
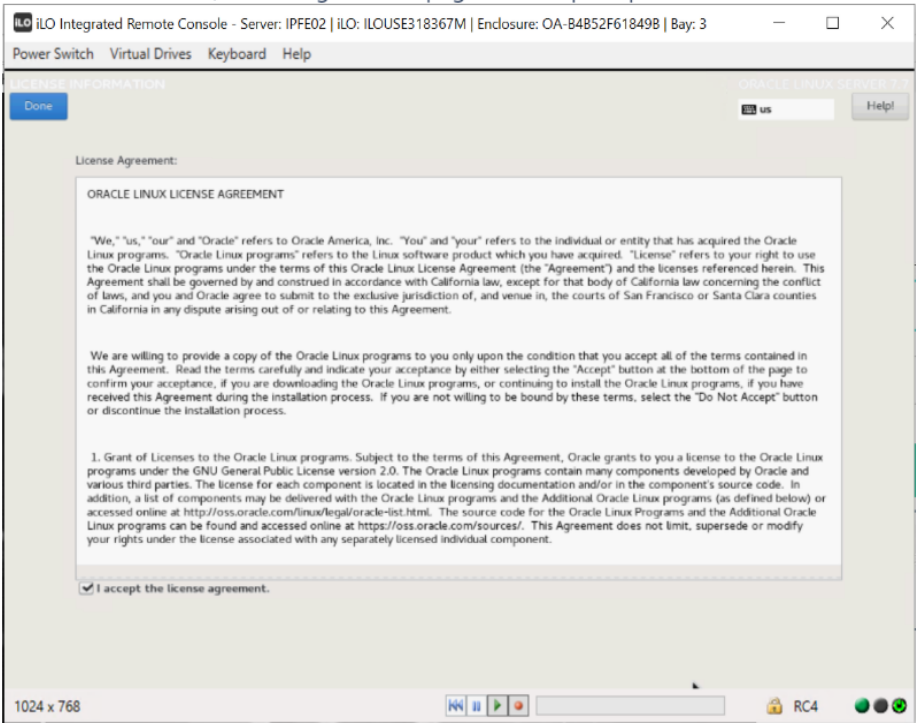
STEP #	Procedure	Description
		 <p>Click <b>LOCALIZATION -&gt; DATE &amp; TIME</b>:</p> <ul style="list-style-type: none"> <li>• Pick a time zone by selecting a region and city from the drop-down lists, or by clicking a location on the map.</li> <li>• Choose a country and city that are in the same time zone as your system.</li> </ul> <p>You need to specify a time zone even if you intend to use the Network Time Protocol (NTP) to set the time on the system. Before you can enable NTP, ensure that the system is connected to a network by selecting the <b>Network &amp; Hostname</b> option on the <b>INSTALLATION SUMMARY</b> screen (see <b>Configuring the Host Name and Connecting to a Network</b>).</p> <p>To enable NTP,</p> <ul style="list-style-type: none"> <li>• Switch <b>ON</b> the <b>Network Time</b></li> <li>• Click the <b>Settings</b> button to display a dialog where you can configure the NTP servers used by the system</li> </ul> <p>To set the date and time manually:</p> <ul style="list-style-type: none"> <li>• Switch <b>OFF</b> the <b>Network Time</b></li> <li>• Adjust the date and time at the bottom of the screen if needed.</li> </ul> <p>Click <b>Done</b> to save your configuration and return to the <b>INSTALLATION SUMMARY</b> screen.</p>
6.	<p><input type="checkbox"/> For each <b>Blade</b>:</p> <p>Setup</p>	<p>Click <b>SOFTWARE SELECTION</b> options in the <b>SOFTWARE</b> area. Select <b>Server with GUI</b> from the <b>Base Environment</b> area, and ensure that the following add-ons are selected:</p>

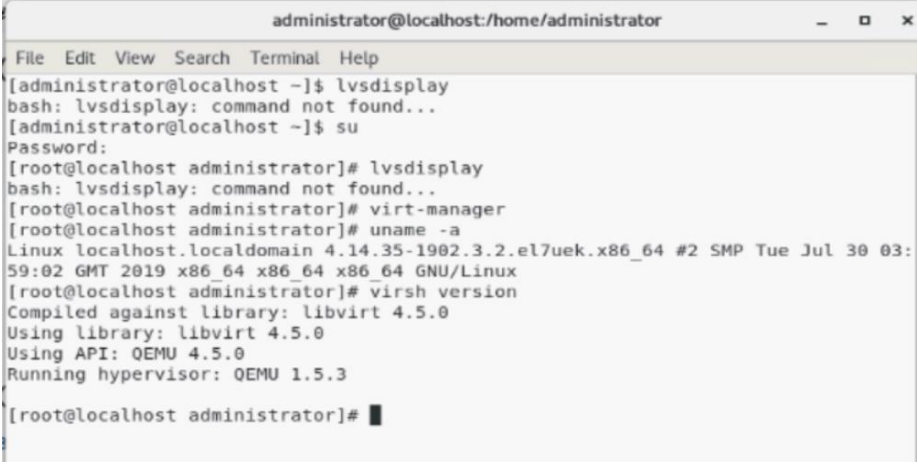
STEP #	Procedure	Description
	installation base environment	<ul style="list-style-type: none"> <li>• Virtualization Client</li> <li>• Virtualization Hypervisor</li> <li>• Virtualization Tools</li> <li>• Compatibility Libraries</li> </ul>  <p>Click <b>Done</b> to save the changes and go back to the main configuration page.</p>
7. <input type="checkbox"/>	For each <b>Blade:</b>  Setup installation destination	Click <b>INSTALLATION DESTINATION</b> in the <b>SYSTEM</b> area. <ul style="list-style-type: none"> <li>• Select 'sda' (or 'sdb') to use</li> <li>• Check <b>Automatically configure partitioning</b></li> <li>• Click <b>Done</b> to continue</li> </ul>

STEP #	Procedure	Description
		
<p>8. <input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Review configuration and start installation</p>	<p>Review all the information and click <b>Begin Installation</b>.</p> <p><b>Note:</b> Network configuration is not mandatory at this point and can be performed after Oracle Linux OS is installed.</p> 

STEP #	Procedure	Description
<p>9.</p> <input type="checkbox"/>	<p>For each <b>Blade:</b></p> <p>Create login credential</p>	<p>At the same time Oracle Linux installation software is laying down files into Gen 10 local hard disk, you may configure root credential or any other login credentials as per the requirement:</p>  <p>The screenshot shows the Oracle Linux 7.7 installation configuration interface. The window title is 'iLO Integrated Remote Console - Server: IPFE02   iLO: ILOUSE318367M   Enclosure: OA-B4852F61849B   Bay: 3'. The main content area is titled 'CONFIGURATION' and 'ORACLE LINUX 7.7 INSTALLATION'. Under 'USER SETTINGS', there is a 'ROOT PASSWORD' section with a key icon and the text 'Root password is set'. To the right, there is a 'USER CREATION' section with a person icon and the text 'User administrator will be created'. At the bottom, there is a progress bar labeled 'Starting package installation process' and a banner for 'DTrace: Providing comprehensive tracing capabilities for complete software observability from a single tool.' The window also shows a 'Power Switch' menu, 'Virtual Drives', 'Keyboard', and 'Help' options. The bottom status bar displays '1024 x 768', 'RC4', and system icons.</p>
<p>10.</p> <input type="checkbox"/>	<p>For each <b>Blade:</b></p> <p>Reboot host after installation completed</p>	<p>Wait for the installation to complete, until the following screen appears:</p>



STEP #	Procedure	Description
		 <p>Click <b>Reboot</b> button to reboot.</p>
<p>11.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Read &amp; Accept license agreement</p>	<p>After reboot is done, license agreement page appears:</p>  <p>Check "I accept the license agreement", following with "Finish"</p>

STEP #	Procedure	Description
		<p>Configuration" to continue.</p> <p>Skip when prompted for ULN settings.</p>
<p>12.</p> <p><input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Verify kernel version and KVM version</p>	<p>Open SSH console window and check following:</p>  <pre> administrator@localhost:/home/administrator File Edit View Search Terminal Help [administrator@localhost ~]\$ lvsdisplay bash: lvsdisplay: command not found... [administrator@localhost ~]\$ su Password: [root@localhost administrator]# lvsdisplay bash: lvsdisplay: command not found... [root@localhost administrator]# virt-manager [root@localhost administrator]# uname -a Linux localhost.localdomain 4.14.35-1902.3.2.el7uek.x86_64 #2 SMP Tue Jul 30 03:59:02 GMT 2019 x86_64 x86_64 x86_64 GNU/Linux [root@localhost administrator]# virsh version Compiled against library: libvirt 4.5.0 Using library: libvirt 4.5.0 Using API: QEMU 4.5.0 Running hypervisor: QEMU 1.5.3  [root@localhost administrator]# </pre>
<p>13.</p> <p><input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Change network interface name pattern to <b>ethx</b></p>	<p>Edit /etc/default/grub to append 'net.ifnames=0' with option GRUB_CMDLINE_LINUX:</p> <pre>[root@localhost ~]# cat /etc/default/grub</pre> <pre> GRUB_TIMEOUT=5 GRUB_DISTRIBUTOR="\$(sed 's, release .*\$,,g' /etc/system-release)" GRUB_DEFAULT=saved GRUB_DISABLE_SUBMENU=true GRUB_TERMINAL_OUTPUT="console" GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=ol/root rd.lvm.lv=ol/swap rhgb iet net.ifnames=0" GRUB_DISABLE_RECOVERY="true" </pre> <p>Recreate the grub2 config file by executing:</p> <pre>grub2-mkconfig -o /boot/grub2/grub.cfg</pre> <p>Restart host and verify that the network interfaces have <b>ethx</b> name pattern, by executing:</p> <pre>shutdown -r</pre>
<p>14.</p> <p><input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Create bond0 device</p>	<p>1. Create device bond0 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-bond0</pre> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond0</pre> <pre> DEVICE=bond0 TYPE=Bonding BOND_INTERFACES=eth0,eth1 ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BONDING_OPTS="mode=active-backup primary=eth0 miimon=100" </pre> <p>Save the file and exit.</p>

STEP #	Procedure	Description
		<p>2. Create device eth0 configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-eth0 [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre>           Save the file and exit.</p> <p>3. Create device eth1 configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-eth1 [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth1 DEVICE=eth1 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre>           Save the file and exit.</p> <p>4. Bring up devices into services:  <pre>[root@DSR-Gen10-017 ~]# ifup eth0 [root@DSR-Gen10-017 ~]# ifup eth1 [root@DSR-Gen10-017 ~]# ifup bond0 [root@DSR-Gen10-017 ~]# _</pre></p>
<p>15.  <input type="checkbox"/></p>	<p>For each  <b>Blade:</b>             Create IMI            bridge</p>	<p>1. Create bond0.&lt;imi_vlan&gt; configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-bond0.&lt;imi_vlan&gt; [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre></p> <p>2. Create imi device configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-imi [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-imi DEVICE=imi TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE_INTERFACES=bond0.4</pre></p> <p>3. Bring up devices into services:  <pre>[root@DSR-Gen10-017 ~]# ifup bond0.4 [root@DSR-Gen10-017 ~]# ifup imi [root@DSR-Gen10-017 ~]# _</pre></p>
<p>16.</p>	<p>For each  <b>Blade:</b></p>	<p>1. Create bond0.&lt;xmi_vlan&gt; configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-</pre></p>

STEP #	Procedure	Description
<input type="checkbox"/>	<p>Create XMI bridge</p>	<pre>bond0.&lt;xmi_vlan&gt; [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond0.3 DEVICE=bond0.3 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE=xmi VLAN=yes</pre> <p>2. Create xmi device configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-xmi [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-xmi DEVICE=xmi TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none NETMASK=255.255.255.128 IPADDR=10.75.193.196 NETWORK=10.75.193.128 GATEWAY=10.75.193.129 BRIDGE_INTERFACES=bond0.3</pre> <p>3. Set default route for xmi network:</p> <pre>vim /etc/sysconfig/network-scripts/route-xmi default via &lt;xmi_gateway&gt; table main [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/route-xmi default via 10.75.193.196 table main</pre> <p>4. Bring up the devices into service:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup bond0.3 [root@DSR-Gen10-ol7 ~]# ifup xmi [root@DSR-Gen10-ol7 ~]#</pre>
<p>17.</p> <input type="checkbox"/>	<p>For each Blade:  Create bond1 device</p>	<p>1. Create device bond1 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-bond1</pre> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond1 DEVICE=bond1 TYPE=Bonding BOND_INTERFACES=eth2,eth3 ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BONDING_OPTS="mode=active-backup primary=eth2 miimon=100"</pre> <p>2. Create device eth2 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-eth2</pre> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth2 DEVICE=eth2 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond1 SLAVE=yes</pre>

STEP #	Procedure	Description
		<p>3. Create device eth3 configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-eth3</code></p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth3 DEVICE=eth3 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond1 SLAVE=yes</pre> <p>4. Bring up devices into services:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup eth2 [root@DSR-Gen10-ol7 ~]# ifup eth3 [root@DSR-Gen10-ol7 ~]# ifup bond1 [root@DSR-Gen10-ol7 ~]#</pre>
<p>18.  <input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Create xsi1/xsi2 bridge</p>	<p>1. Create device bond1.&lt;xsi1_vlan&gt; configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-bond1.&lt;xsi1_vlan&gt;</code></p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond1.5 DEVICE=bond1.5 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE=xsi1 VLAN=yes</pre> <p>2. Create device xsi1 configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-xsi1</code></p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-xsi1 DEVICE=xsi1 TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE_INTERFACES=bond1.5</pre> <p>3. Bring up devices into services:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup xsi1 [root@DSR-Gen10-ol7 ~]# ifup bond1.5</pre> <p>Perform similar operations to create network devices for xsi2</p> <p>1. Create device bond1.&lt;xsi1_vlan&gt; configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-bond1.&lt;xsi2_vlan&gt;</code></p>

STEP #	Procedure	Description
		<pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond1.6 DEVICE=bond1.6 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE=xsi2 VLAN=yes</pre> <p>2. Create device xsi1 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-xsi2</pre> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-xsi2 DEVICE=xsi2 TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE_INTERFACES=bond1.6</pre> <p>3. Bring up devices into services:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup xsi2 [root@DSR-Gen10-ol7 ~]# ifup bond1.6 [root@DSR-Gen10-ol7 ~]# _</pre>
<p>19.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Set host name</p>	<p>Rename host by modifying <code>/etc/hostname</code> file:</p> <pre>[root@localhost ~]# cat /etc/hostname DSR-Gen10-ol7 [root@localhost ~]#</pre> <p>Review host name change with following command:</p> <pre>[root@localhost ~]# hostnamectl status Static hostname: DSR-Gen10-ol7 Icon name: computer-server Chassis: server Machine ID: 0feb15c7d858467995a403846cc779c4 Boot ID: 3538d11fb3004079b1164ca646b924a7 Operating System: Oracle Linux Server 7.7 CPE OS Name: cpe:/o:oracle:linux:7:7:server Kernel: Linux 4.14.35-1902.3.2.el7uek.x86_64 Architecture: x86-64 [root@localhost ~]#</pre>
<p>20.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Set NTP service</p>	<p>Modify <code>/etc/chrony.conf</code>, comment out all server * entries and append your NTP server IP to the list with prepending 'server ' text:</p> <pre># Use public servers from the pool.ntp.org project. # Please consider joining the pool (http://www.pool.ntp.org/join.html). #server 0.pool.ntp.org iburst #server 1.pool.ntp.org iburst #server 2.pool.ntp.org iburst #server 3.pool.ntp.org iburst server 10.250.32.10</pre> <p>Force ntp to sync with newly added server:</p>

STEP #	Procedure	Description
		<pre> 1. \$ ntpdate 10.250.32.10 2. \$ timedatectl 3. \$ chronyc tracking  Verify time synced:  [root@localhost ~]# chronyc tracking Reference ID      : 0AFA200A (10.250.32.10) Stratum          : 4 Ref time (UTC)   : Tue Mar 17 17:53:37 2020 System time      : 0.000019021 seconds fast of NTP time Last offset      : +0.000024270 seconds RMS offset       : 0.000036262 seconds Frequency        : 0.478 ppm slow Residual freq    : +0.022 ppm Skew             : 0.381 ppm Root delay       : 0.037895955 seconds Root dispersion  : 0.052380055 seconds Update interval  : 64.8 seconds Leap status      : Normal [root@localhost ~]# </pre>
<p>21. <input type="checkbox"/></p>	<p>For each Blade: Create ova dir</p>	<p>Create /home/ova dir:</p> <pre> [root@DSR-Gen10-ol7 ~]# mkdir /home/ova/ [root@DSR-Gen10-ol7 ~]# cd /home/ova/ [root@DSR-Gen10-ol7 ova]# </pre>
<p>22. <input type="checkbox"/></p>	<p>Transfer OVA file dir</p>	<p>Transfer OVA file dir using sftp tool:</p> <pre> [root@DSR-Gen10-ol7 ova]# ll total 36911960 -rw-r--r--. 1 root root 1653708800 Mar 14 16:02 DSR-8.4.0.0_84.17.0.ova </pre>
<p>23. <input type="checkbox"/></p>	<p>Untar the ova file</p>	<p>Untar the ova file:</p> <pre> [root@DSR-Gen10-ol7 ova]# tar xvf DSR-8.4.0.0_84.17.0.ova DSR-84_17_0.ovf DSR-84_17_0.mf DSR-84_17_0.vmdk [root@DSR-Gen10-ol7 ova]# </pre>
<p>24. <input type="checkbox"/></p>	<p>Convert the vmdk file to qcow2 file</p>	<p>Convert the vmdk file to qcow2 file:</p> <pre> [root@DSR-Gen10-ol7 ova]# qemu-img convert -O qcow2 DSR-84_17_0.vmdk DSRN0-84_17_0.qcow2 [root@DSR-Gen10-ol7 ova]# </pre>
<p>25. <input type="checkbox"/></p>	<p>Copy the qcow2 files for SO and MP</p>	<p>Copy the qcow2 files for SO and MP:</p> <pre> [root@DSR-Gen10-ol7 ova]# cp DSRN0-84_17_0.qcow2 DSR50-84_17_0.qcow2 [root@DSR-Gen10-ol7 ova]# cp DSRN0-84_17_0.qcow2 DSRMP-84_17_0.qcow2 </pre>

STEP #	Procedure	Description
<p>26. <input type="checkbox"/></p>	<p>Configure storage for corresponding qcow2 files</p>	<p>Configure storage qcow2 files as per corresponding VMs. Refer VM Resource Profile Flavor section to get the required storage.</p> <p>To set the storage for each VM, execute:</p> <pre>qemu-img resize &lt;NO_qcow2_filename&gt;.qcow2 &lt;storage_in_gigabytes&gt;G</pre> <p>Run the command for a VM if storage required is &gt;60G. No need to run this command if the storage required is 60G.</p> <p>For example:</p> <p>If resource profile is 2K Sh and VM is NOAMP, whereas the storage required is 70G, execute:</p> <pre>qemu-img resize DSRNO-84_17_0.qcow2 70G</pre> <p>For multiqueue setting refer to Appendix I.3. For Ring buffer, refer Appendix I.4</p>
<p>27. <input type="checkbox"/></p>	<p>Set the txqueue length for the ether-net adapter to a high value on the host machine</p>	<p>Add below script to the above created file /sbin/ifup-local:</p> <pre>[root@DSR-Gen10-ol7 ova]# vim /sbin/ifup-local</pre> <pre>ifconfig eth0 txqueuelen 120000 ifconfig eth1 txqueuelen 120000 ifconfig eth2 txqueuelen 120000 ifconfig eth3 txqueuelen 120000</pre>
<p>28. <input type="checkbox"/></p>	<p>Verify txqueue length for the ether-net adapter to a high value on the host machine that is added on all interfaces</p>	<p>Verify txqueue length for the ether-net adapter to a high value on the host machine that is added on all interfaces:</p> <pre>[root@DSR-Gen10-ol7 ova]# ifconfig &lt;ethernet adapter&gt;</pre> <p>Verify same for eth1, eth2, and eth3</p>
<p>29. <input type="checkbox"/></p>	<p>Restart all interfaces</p>	<p>Restart all the ethernet adapters eth0, eth1, eth2, and eth3, one at a time:</p> <pre>[root@DSR-Gen10-ol7 ova]# ifdown &lt;ethernet adapter&gt;</pre> <pre>[root@DSR-Gen10-ol7 ova]# ifup &lt;ethernet adapter&gt;</pre> <p>Verify again by using above Step 40.</p>
<p>30. <input type="checkbox"/></p>	<p>Reboot the host machine</p>	<p>Reboot the host machine:</p> <pre>[root@DSR-Gen10-ol7 ova]# reboot</pre>



STEP #	Procedure	Description
31. <input type="checkbox"/>	Verify below points on host machine ring buffer sizes are set to max on all the ether-net devices txqueue length for all the ether-net adapter to a high value	Verify that the following configurations on host machine persist as per the configuration done above: <ul style="list-style-type: none"> <li>• If you have performed Multiqueue configuration on IPFE using Appendix I.3, verify the configuration as mentioned the appendix.</li> <li>• Ring buffer size setting to max on all the ether-net devices using Step 37.</li> <li>• The txqueue length for all the ether-net adapter to a high value using Step 28.</li> </ul>
32. <input type="checkbox"/>	Create OCDSR VMs. Repeat this step for each VM	Create OCDSR VMs such as NO, SO, MP, IPFE and so on.  See <b>Create and Install OCDSR VM via KVM GUI</b> . Repeat this procedure for each VM. As addition completes for each Server, tick mark the associated check box.

STEP #	Procedure	Description
33. <input type="checkbox"/>	For each DSR VMs:  Add the network device	<p>Login to each VM created and add the network devices:</p> <p><b>NO:</b></p> <ul style="list-style-type: none"> <li>• netAdm add -device=eth0</li> <li>• netAdm add -device=eth1</li> </ul> <p><b>SO:</b></p> <ul style="list-style-type: none"> <li>• netAdm add -device=eth0</li> <li>• netAdm add -device=eth1</li> </ul> <p><b>MP:</b></p> <ul style="list-style-type: none"> <li>• netAdm add -device=eth0</li> <li>• netAdm add -device=eth1</li> <li>• netAdm add -device=eth2</li> <li>• netAdm add -device=eth3</li> </ul> <p>For example:</p> <pre>[root@hostnamef3975b010b56 ~]# netAdm add --device=eth0 ERROR: Interface eth0 already exists ERROR: Configuration of eth0 failed [root@hostnamef3975b010b56 ~]# netAdm add --device=eth1 Interface eth1 added [root@hostnamef3975b010b56 ~]# netAdm add --device=eth2 Interface eth2 added [root@hostnamef3975b010b56 ~]# netAdm add --device=eth3 Interface eth3 added</pre> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• eth0 is XMI</li> <li>• eth1 is IMI</li> <li>• eth2 is XSI1</li> <li>• eth3 is XSI2 (create eth3 if XSI2 is required)</li> </ul>

STEP #	Procedure	Description
34. <input type="checkbox"/>	For each DSR VMs:  Configure XMI network address	<p>Set XMI network address for each DSR VM:</p> <pre>netAdm set --device=eth0 --onboot=yes --netmask=&lt;XMI_netmask&gt; --address=&lt;XMI_network_address&gt;</pre> <pre>netAdm add --device=eth0 --route=default --gateway=&lt;XMI_gateway&gt;</pre> <p>For example:</p> <pre>root@hostnamef3975b010b56 ~]# netAdm set --onboot=yes --device=eth0 --netmask=255.255.255.128 --address=10.75.193.195 Interface eth0 updated root@hostnamef3975b010b56 ~]# netAdm add --device=eth0 --route=default --gateway=10.75.193.129 Route to eth0 added root@hostnamef3975b010b56 ~]#</pre>
35. <input type="checkbox"/>	For each DSR VMs:  Configure NTP service	<p>Configure NTP service for each VM. Execute this step on VM.</p> <p>Open the <code>/etc/ntp.conf</code> file and add the NTP servers used in your environment.</p> <p>You can add multiple NTP servers, similar to the examples shown below:</p> <pre># # List of NTP servers and peers # server 10.250.32.10 iburst server ntpserver1 iburst server ntpserver2 iburst server ntpserver3 iburst peer ntppeerA iburst peer ntppeerB iburst</pre> <p>Run the service <code>ntpd start</code> command to start the NTP service and implement the configuration changes:</p> <pre>[admusr@hostnamef37eece35d2c ~]\$ sudo service ntpd restart Shutting down ntpd: [ OK ] Starting ntpd: [ OK ]</pre> <p>Verify ntp status:</p> <pre>[admusr@hostnamef37eece35d2c ~]\$ ntpstat synchronised to NTP server (10.250.32.10) at stratum 4 time correct to within 1877 ms polling server every 64 s</pre>

### 2.3.2 Create and Install OCSR VMs via KVM GUI

#### Procedure 2. Create and Install OCSR VMs via KVM GUI

STEP #	Procedure	Description
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This procedure will install DSR VMs NO, SO, and MP using KVM GUI.

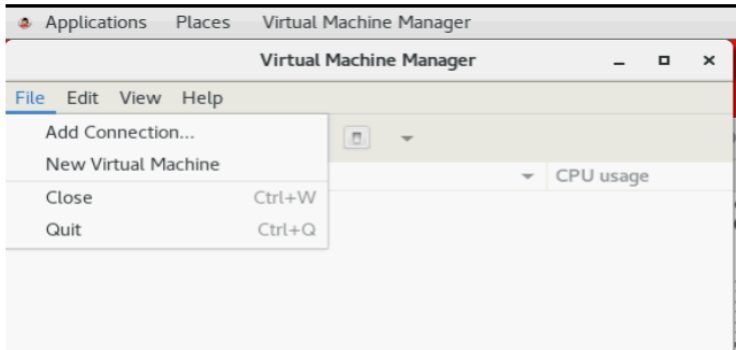
**Note:**

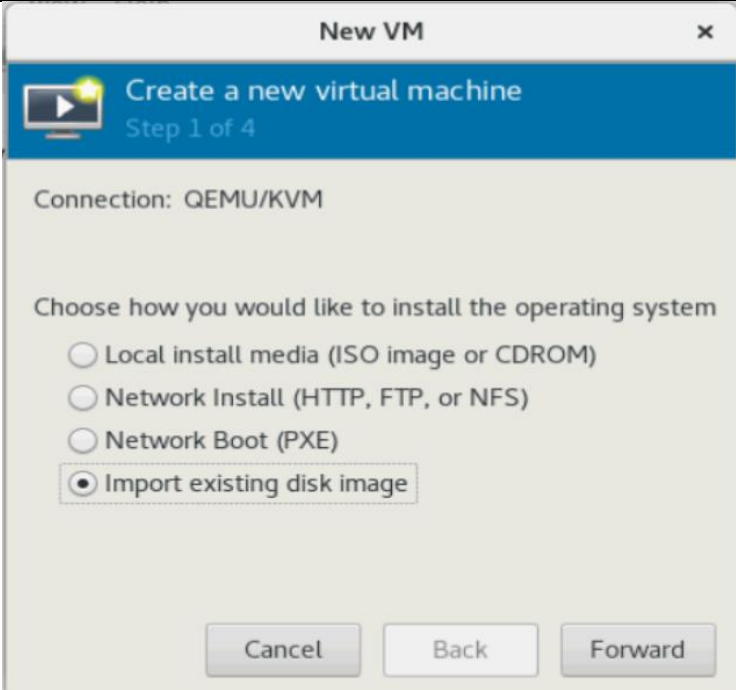
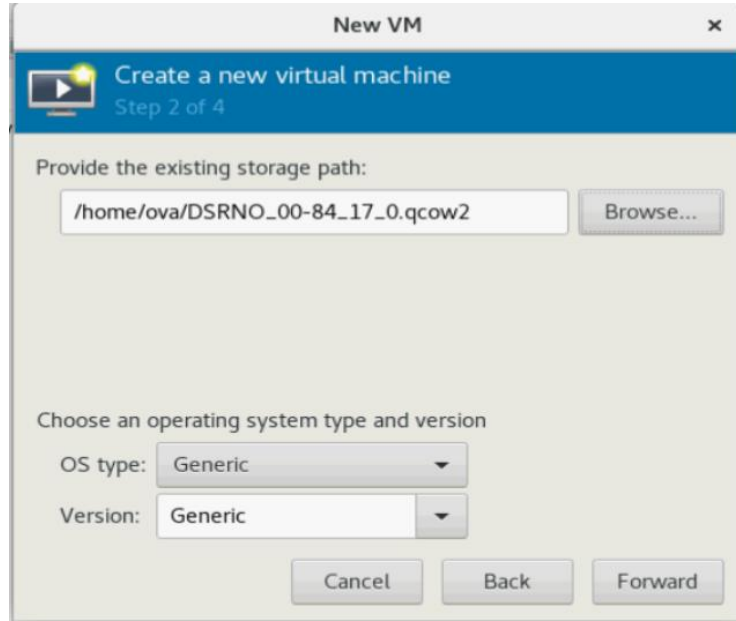
- This installation procedure is only applicable for each VM: NO, SO, MP and so on.

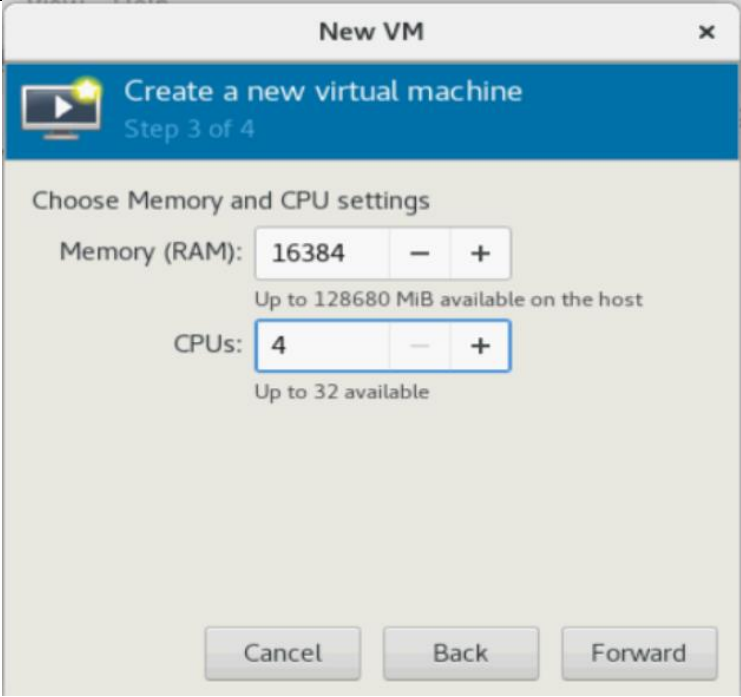
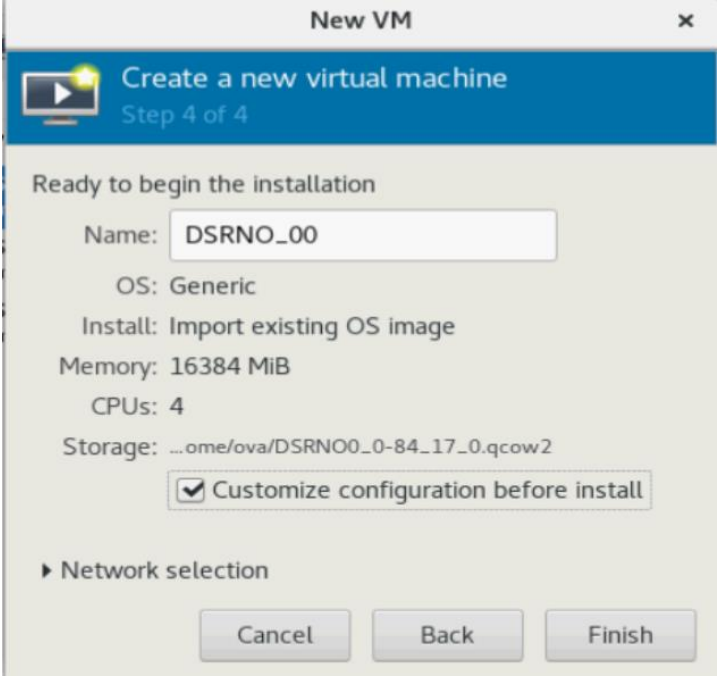
**Prerequisite:** Install DSR on Oracle Linux OS via KVM (Step 1 to 25 must be complete)

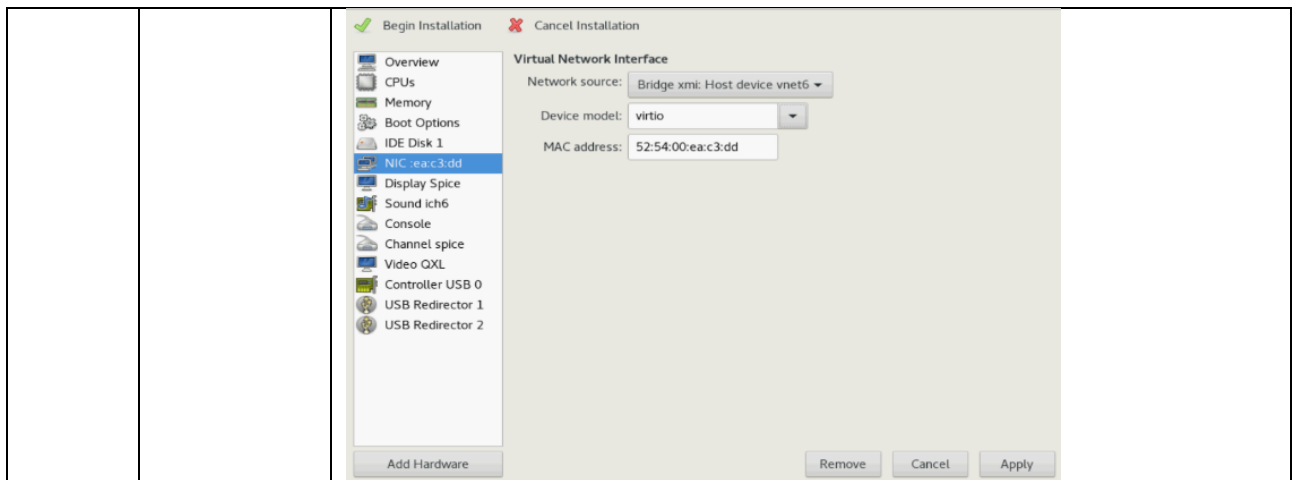
Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.

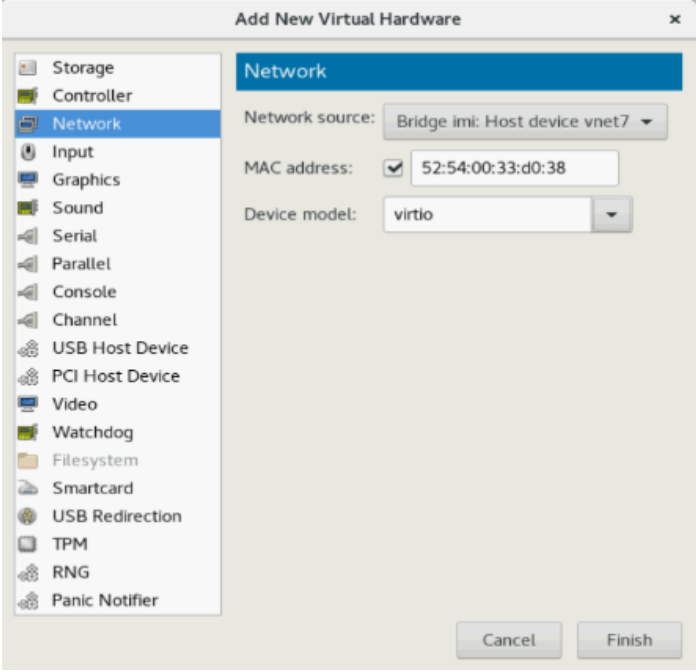
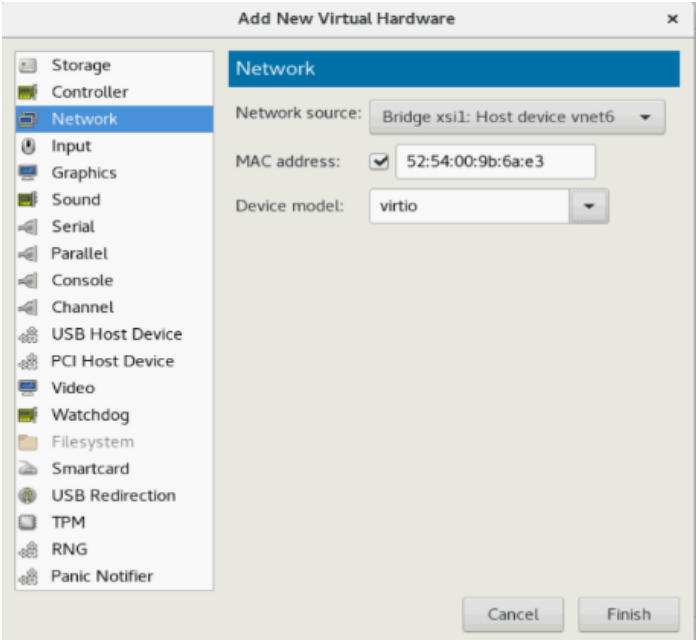
If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.

<p>1. <input type="checkbox"/></p>	<p>Login to the host machine and open the Virtual Machine Manager</p>	<p>Login to the host machine which has Oracle Linux installed and open the Virtual Machine Manager via cli, by executing:</p> <pre>virt-manager</pre> <p><b>Note:</b> Make sure X11 forwarding is enabled before running <code>virt-manager</code> command on CLI.</p> 
<p>2. <input type="checkbox"/></p>	<p>Create a new Virtual Machine using the Virtual Manager GUI</p>	<p>On Virtual Manager GUI,</p> <ol style="list-style-type: none"> <li>1. Click <b>File -&gt; New Virtual Machine</b></li> <li>2. Select <b>Import existing disk image</b></li> </ol>

		
<p>3. <input type="checkbox"/></p>	<p>Select the image file</p>	<p>Select the qcow2 image by browsing the location: /home/ova and Click <b>Forward</b>. See Step 24 and 25 of Install DSR on Oracle Linux/KVM</p> 
<p>4. <input type="checkbox"/></p>	<p>Select RAM and vCPUs for VM</p>	<p>Select RAM and vCPUs for VM. For each VM, select the RAM and vCPUs as per the required resource profile. Refer to VM Resource Profile Flavor section. Click <b>Forward</b>.</p>

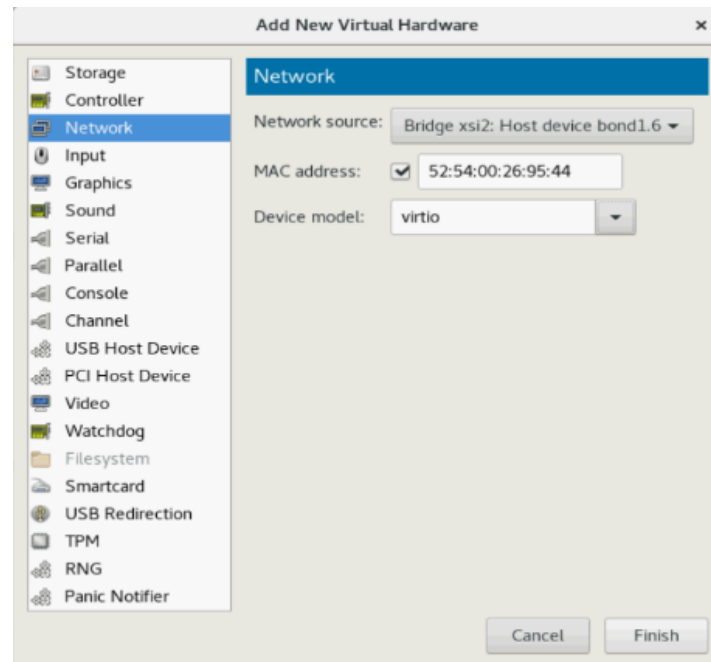
		
<p>5. <input type="checkbox"/></p>	<p>Verify and customize VM</p>	<p>Update the VM name and select <b>Customize configuration before install</b>. Under Network selection, select XMI bridge and click <b>Finish</b>.</p> 
<p>6. <input type="checkbox"/></p>	<p>Modify the Device model to virtio for XMI bridge</p>	<p>For XMI bridge, modify the device model to virtio:</p>



<p>7. <input type="checkbox"/></p>	<p>Customize the network configuration</p>	<p>On the next screen, Click <b>Add Hardware</b>.</p> <ul style="list-style-type: none"> <li>• Under Network source, choose the IMI Bridge.</li> <li>• For NO and SO, choose IMI bridge only.</li> <li>• For MP, add XSI1, along with IMI by repeating this step.</li> <li>• Click <b>Finish</b>.</li> </ul>  <p>Only for MP, we need to add XSI1 &amp; XSI2 bridge as well. For XSI1 bridge:</p> 
------------------------------------	--	---



For XSI2 bridge:

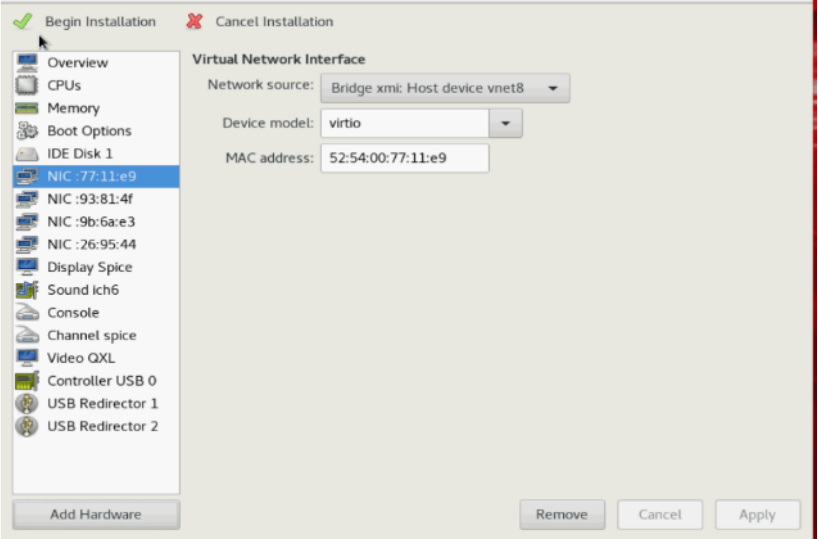


**Note:**

- For DSR Topology it is recommended to add all interfaces on each VM, even when the VM does not require that interface or does not use a VLAN.
- It is just to use a standard when the topology is created from NOAM GUI.

DSR VMs	
XMI	eth0
IMI	eth1
XSI1	eth2
XSI2	eth3

Add all interfaces as needed. After adding the other networks, you will see the NICs appear.

<p>8.</p> <p><input type="checkbox"/></p>	<p>Verify and begin installation</p>	<p>After adding all bridges, verify and begin the VM installation:</p> 
<p>9.</p>	<p>Disable TSO GSO features (Optional)</p>	<p>To disable the TSO GSO features for SBR server, see Appendix I.5.</p>

Software Installation Using HEAT Templates (OpenStack) for detailed procedures.

## 2.4 Optional Features

When DSR installation is complete, further configuration and/or installation steps are needed for optional features that may be present in this deployment. Please refer to Table 5 for the post-DSR installation configuration documentation needed for their components.

**Table 5. Post-DSR Installation Configuration Step**

Feature	Document
Diameter Mediation	DSR Meta Administration Feature Activation Procedure
Full Address Based Resolution (FABR)	DSR FABR Feature Activation Procedure
Range Based Address Resolution (RBAR)	DSR RBAR Feature Activation Procedure
SCEF Feature Activation	DSR SCEF Feature Activation Guide
Policy and Charging Application (PCA)	PCA Activation Procedure
Host Intrusion Detection System (HIDS)	DSR Security Guide, Section 3.2
Diameter Custom Applications (DCA)	DCA Framework and Application Activation and Deactivation Procedures

## 3. Software Installation Procedure

As mentioned earlier, the host configuration and virtual networks should be done before executing the procedures in this document. It is assumed that at this point the user has access to:

- Consoles of all guests and hosts at all sites
- ssh access to the guests at all sites
- GUI access to hosts at all sites
- A configuration station with a web browser, ssh client, and scp client
- VM Manager Privileges to add OVA's to catalog (VMware only)
- KVM/OpenStack admin and tenant privileges
- OVM-S/OVM-M credentials and privileges, OVM-M cli tool must be installed and is accessible

### **SUDO**

As a non-root user (**admusr**), many commands (when run as admusr) now require the use of **sudo**.

### **VIP/TSA (OpenStack Only)**

OpenStack release Kilo or later is required to configure VIP and target set addresses. Kilo release 2015.1.2 or later is preferred.

### **IPv6**

IPv6 configuration of XMI and IMI networks has been introduced in DSR. Standard IPv6 formats for IPv6 and prefix can be used in all IP configuration screens, which enable the DSR to be run in an IPv6 only environment. When using IPv6 for XMI and management, you must place the IPv6 address in brackets (highlighted in red below), example as followed:

```
https://[<IPv6 address>]
```

If a dual-stack (IPv4 and IPv6) network is required, configure the topology with IPv4 first, and then **migrate** to IPv6. Reference [18] DSR IPv6 Migration Guide for instructions on how to accomplish this migration.

### 3.1 Create DSR Guests (VMware)

#### Procedure 3. (VMware) Import DSR OVA

STEP #	Procedure	Description
<p>This procedure adds the DSR OVA to the VMware catalog or repository.                      Check off (✓) each step as it is completed. Steps with shaded boxes require user input.                      If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	Add DSR OVA image	1. Launch the VMware client of your choice. 2. Add the DSR OVA image to the VMware catalog or repository. Follow the instructions provided by the Cloud solutions manufacturer.

#### Procedure 4. (VMware only) Configure NOAM Guests Role Based On Resource Profile and Configure Network

STEP #	Procedure	Description
<p>This procedure configures networking on VMs.                      Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.                      If this procedure fails, My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	Create the NOAM1 VM from the OVA image	1. Browse the library or repository that you placed the <b>OVA</b> image. 2. Deploy the OVA Image using <b>vSphere Client</b> or <b>vSphere Web Client</b> . 3. Name the <b>NOAM1 VM</b> and select the data store.
2. <input type="checkbox"/>	Configure resources for the NOAM1 VM	Configure the NOAM1 per the resource profiles defined in [24] DSR Cloud Benchmarking Guide for the <b>DSR NOAM</b> using the <b>vSphere Client</b> or <b>vSphere Web Client</b> .
3. <input type="checkbox"/>	Power on NOAM1	Use the <b>vSphere Client</b> or <b>vSphere Web Client</b> to power on the NOAM1 VM.

STEP #	Procedure	Description
<input type="checkbox"/> 4.	Configure NOAM1	1. Access the <b>NOAM1 VM</b> console via the <b>vSphere Client</b> or <b>vSphere Web Client</b> . 2. Login as the <b>admusr</b> user. 3. Set the <ethX> device: <b>Note:</b> Where ethX is the interface associated with the XMI network. <pre>\$ sudo netAdm add --device=&lt;ethX&gt; --address=&lt;IP Address in External management Network&gt; --netmask=&lt;Netmask&gt; --onboot=yes --bootproto=none</pre> 4. Add the default route for ethX: <pre>\$ sudo netAdm add --route=default --gateway=&lt;gateway address for the External management network&gt; --device=&lt;ethX&gt;</pre> 5. Ping the XMI gateway for network verification. <pre>\$ ping -c3 &lt;Gateway of External Management Network&gt;</pre>
<input type="checkbox"/> 5.	Configure NOAM2	Repeat steps 1 through 4 for the NOAM2 VM.

**Procedure 5. (VMware only) Configure Remaining DSR Guests Based on Resource Profile and Configure Network**

STEP #	Procedure	Description
This procedure adds network addresses for all VMs. <b>Note:</b> This procedure provides an example for creating an SOAM. Follow the same steps to create other guests with their respective VM names and profiles. Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.		
<input type="checkbox"/> 1.	Create the SOAM1 VM from the OVA image	1. Browse the library or repository that you placed the <b>OVA</b> image. 2. Deploy the OVA image using <b>vSphere Client</b> or <b>vSphere Web Client</b> . 3. Name the <b>SOAM1 VM</b> and select the data store.
<input type="checkbox"/> 2.	Configure resources for the SOAM1 VM	Configure the <b>SOAM1 VM</b> per the resource profiles defined in [24] DSR Cloud Benchmarking Guide for the <b>DSR SO</b> using the <b>vSphere Client</b> or <b>vSphere Web Client</b> . Interfaces must be added per the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide.
<input type="checkbox"/> 3.	Power on SOAM1 VM	1. Power on the <b>DSR SOAM1 VM</b> with the <b>vSphere Client</b> or <b>vSphere Web Client</b> . 2. Monitor the vApps screen's Virtual Machines tab until the DSR VM reports <b>Powered On</b> in the Status column.

STEP #	Procedure	Description
<input type="checkbox"/> 4.	Configure XMI interface	1. Access the <b>VM console</b> via the <b>vSphere Client</b> or <b>vSphere Web Client</b> . 2. Login as the <b>admusr</b> user. 3. Set the ethX device: <b>Note:</b> Where ethX is the interface associated with the XMI network. <pre>\$ sudo netAdm add --device=&lt;ethX&gt; --address=&lt;IP Address in External Management Network&gt; --netmask=&lt;Netmask&gt; --onboot=yes --bootproto=none</pre> 4. Add the default route for ethX: <pre>\$ sudo netAdm add --route=default --gateway=&lt;gateway address for the External management network&gt; --device=&lt;ethX&gt;</pre>
<input type="checkbox"/> 5.	Verify network connectivity	1. Access the <b>SOAM1 VM console</b> using the <b>vSphere Client</b> or <b>vSphere Web Client</b> . 2. Login as the <b>admusr</b> user. 3. Ping the NOAM1. <pre>\$ ping -c3 &lt;IP Address in External Management Network&gt;</pre>
<input type="checkbox"/> 6.	Procedure overview	Repeat steps 1 through 5 for the following VMs. Use unique labels for the VM names: MP(s) IPFE(s) SOAM(s) Session SBRs, Binding SBR (Optional Components) DR NOAMs (Optional Components)

### 3.2 Create DSR Guests (KVM/OpenStack)

#### Procedure 6. Import DSR OVA (KVM/OpenStack Only)

STEP #	Procedure	Description
		This procedure adds the DSR image to the glance image catalog. Check off (✓) each step as it is completed. Steps with shaded boxes require user input. If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.

STEP #	Procedure	Description
1. <input type="checkbox"/>	Preparation	<p>1. Create instance flavors.</p> <p>If not yet done, use the resource profiles defined in [24] DSR Cloud Benchmarking Guide values to create flavors for each type of VM. Flavors can be created with the Horizon GUI in the <b>Admin</b> section, or with the <code>nova flavor-create</code> command line tool. Make the flavor names as informative as possible. As flavors describe resource sizing, a common convention is to use a name like "0406060" where the first two figures (04) represent the number of virtual CPUs, the next two figures (06) might represent the RAM allocation in GB and the final three figures (060) might represent the disk space in GB.</p> <p>2. If using an Intel 10 Gigabit Ethernet ixgbe driver on the host nodes, please note that the default LRO (Large Receive Offload) option must be disabled on the host command line. Please see the Intel release notes for more details. This action can be performed with the following command.</p> <pre>\$ sudo ethtool -K &lt;ETH_DEV&gt; lro off</pre> <p>3. If using IPFE Target Set Addresses (TSA):</p> <ol style="list-style-type: none"> <li>Read and understand the Disable Port Security procedure in Appendix G.6, including the warning note.</li> <li>Enable the Neutron port security extension.</li> </ol> <p><b>Note:</b> This step is <b>NOT</b> applicable for HEAT deployment.</p>

STEP #	Procedure	Description
2. □	Add DSR OVA image	<ol style="list-style-type: none"> <li>1. Copy the OVA file to the OpenStack control node.  <pre>\$ scp DSR-x.x.x.x.x.ova admusr@node:~</pre> </li> <li>2. Log into the OpenStack control node.  <pre>\$ ssh admusr@node</pre> </li> <li>3. In an empty directory, unpack the OVA file using <b>tar</b>.  <pre>\$ tar xvf DSR-x.x.x.x.x.ova</pre> </li> <li>4. One of the unpacked files has a <b>.vmdk</b> suffix. This is the VM image file that must be imported.  <pre>DSR-x.x.x.x.x-disk1.vmdk</pre> </li> <li>5. Source the OpenStack <b>admin</b> user credentials.  <pre>\$ . keystone_admin</pre> </li> <li>6. Select an informative name for the new image.  <pre>dsr-8.5.x.x.x-original</pre> </li> <li>7. Import the image using the <b>glance</b> utility from the command line.  <pre>\$ glance image-create --name dsr-x.x.x.x-original --visibility private --protected false --progress --container-format bare --disk-format vmdk --file DSR-x.x.x.x-disk1.vmdk</pre> </li> </ol> <p>This process takes about 5 minutes depending on the underlying infrastructure.</p> <ol style="list-style-type: none"> <li>8. (Optional – Steps 8 and 9 are not needed if VMDK is used.) Convert VMDK to QCOW2 format.  <p>Use the <code>qemu-img</code> tool to create a qcow2 image file using this command.</p> <pre>qemu-img convert -f vmdk -O qcow2 &lt;VMDK filename&gt; &lt;QCOW2 filename&gt;</pre> <p>For example:</p> <pre>qemu-img convert -f vmdk -O qcow2 DSR-82_12_0.vmdk DSR-82_12_0.qcow2</pre> <p>Install the <code>qemu-img</code> tool (if not already installed) using this yum command.</p> <pre>sudo yum install qemu-img</pre> </li> <li>9. Import the converted qcow2 image using the “glance” utility from the command line.  <pre>\$ glance image-create --name dsr-x.x.x.x-original --is-public True --is-protected False --progress --container-format bare --disk-format qcow2 --file DSR-x.x.x.x-disk1.qcow2</pre> </li> </ol> <p>This process take about 5 minutes depending on the underlying infrastructure.</p>



**Procedure 7. (KVM/OpenStack Only) Configure NOAM Guests Role Based on Resource Profile**

STEP #	Procedure	Description
<p>This procedure configures networking on VMs.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1. <input type="checkbox"/></p>	<p>Name the new VM instance</p>	<p>1. Create an informative name for the new instance: <b>NOAM1</b>.</p> <p>2. Examine the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide.</p>
<p>2. <input type="checkbox"/></p>	<p>Create and boot the NOAM VM instance from the glance image</p>	<p>1. Get the following configuration values.</p> <p>c. The image ID. <code>\$ glance image-list</code></p> <p>d. The flavor ID. <code>\$ nova flavor-list</code></p> <p>e. The network ID(s) <code>\$ neutron net-list</code></p> <p>f. An informative name for the instance. NOAM1 NOAM2</p> <p>2. Create and boot the VM instance.</p> <p>The instance must be owned by the DSR tenant user, not the admin user. Source the credentials of the DSR tenant user and issue the following command. Use one <b>--nic</b> argument for each IP/interface. Number of IP/interfaces for each VM type must conform with the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide.</p> <p><b>Note:</b> IPv6 addresses should use the <b>v6-fixed-ip</b> argument instead of <b>v4-fixed-ip</b>.</p> <pre>\$ nova boot --image &lt;image ID&gt; --flavor &lt;flavor id&gt; --nic net-id=&lt;first network id&gt;,v4-fixed-ip=&lt;first ip address&gt; --nic net-id=&lt;second network id&gt;,v4-fixed-ip=&lt;second ip address&gt; &lt;instance name&gt;</pre> <p>3. View the newly created instance using the nova tool. <code>\$ nova list --all-tenants</code></p> <p>The VM takes approximately 5 minutes to boot and may be accessed through both network interfaces and the Horizon console tool.</p>

STEP #	Procedure	Description
3. <input type="checkbox"/>	Configure NOAM VIP (Optional)	<p><b>Note:</b></p> <p>For information about Firewall Ports, Refer to DSR 8.5 IP flow document. Application VIP Failover Options (OpenStack) in Appendix G for more information on VIP.</p> <p>If an NOAM VIP is needed, execute the following commands:</p> <ol style="list-style-type: none"> <li>Find the port ID associated with the NOAM instance XMI interface. <pre>\$ neutron port-list</pre> </li> <li>Add the VIP IP address to the address pairs list of the NOAM instance XMI interface port. <pre>\$ neutron port-update &lt;Port ID&gt; --allowed_address_pairs list=true type=dict ip_address=&lt;VIP address to be added&gt;</pre> </li> </ol>
4. <input type="checkbox"/>	Check if interface is configured	<p>If DHCP is enabled on the Neutron subnet, VM configures the VNIC with the IP address provided in step 2. To verify, ping the XMI IP address provided with the <b>nova boot</b> command from step 2:</p> <pre>\$ ping &lt;XMI-IP-Provided-During-Nova-Boot&gt;</pre> <p>If the ping is successful, ignore step 5. to configure the interface manually.</p>
5. <input type="checkbox"/>	Manually configure interface, if not already done (Optional)	<p><b>Note:</b> If the instance is already configured with an interface and has successfully pinged (step 4. ), then <b>ignore</b> this step to configure the interface manually.</p> <ol style="list-style-type: none"> <li>Log into the <b>Horizon</b> GUI as the DSR tenant user.</li> <li>Go to the Compute/Instances section.</li> <li>Click the <b>Name</b> field of the newly created instance.</li> <li>Select the Console tab.</li> <li>Login as the <b>admusr</b> user.</li> <li>Configure the network interfaces, conforming with the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide. <pre>\$ sudo netAdm add --onboot=yes --device=eth0 --address=&lt;xmi ip&gt; --netmask=&lt;xmi net mask&gt;</pre> <pre>\$ sudo netAdm add --route=default --device=eth0 --gateway=&lt;xmi gateway ip&gt;</pre> <p>Verify network connectivity by pinging Gateway of XMI network.</p> <pre>\$ ping -c3 &lt;XMI Gateway&gt;</pre> <p>Under some circumstances, it may be necessary to configure as many as 6 or more interfaces.</p> </li> <li>Reboot the NOAM VM. It takes approximately 5 minutes for the VM to complete rebooting. <pre>\$ sudo init 6</pre> </li> </ol> <p>The new VM should now be accessible via both network and Horizon consoles.</p>
6. <input type="checkbox"/>	Configure NOAM2	Repeat steps 1 through 5 for NOAM2.

**Procedure 8. (KVM/OpenStack Only) Configure Remaining DSR Guests Based on Resource Profile and Configure Network**

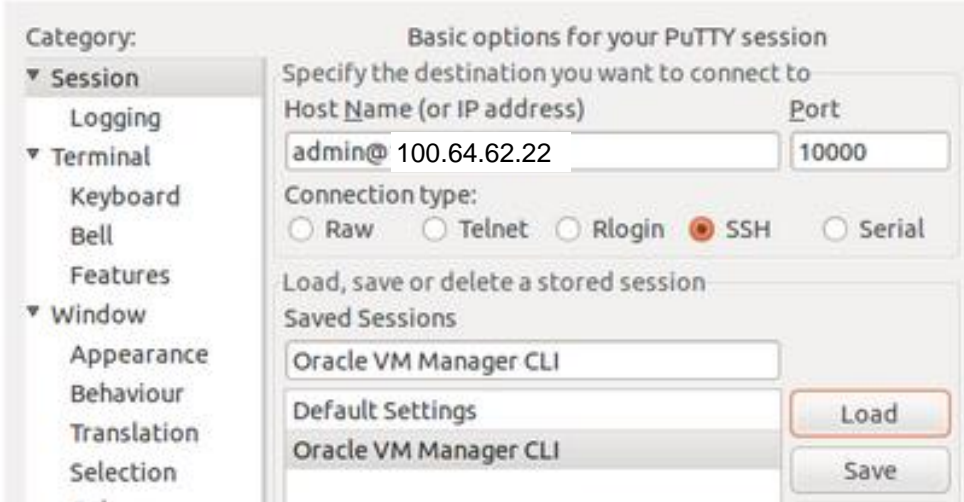
STEP #	Procedure	Description
<p>This procedure adds network addresses for all VMs.</p> <p><b>Note:</b> This procedure provides an example for creating an SOAM. Follow the same steps to create other guests with their respective VM names and profiles.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <p><input type="checkbox"/></p>	<p>Name the new VM instance</p>	<p>1. Create an informative name for the new instance: <b>SOAM1</b>.</p> <p>2. Examine the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide.</p>
<p>2.</p> <p><input type="checkbox"/></p>	<p>Create and boot the SOAM VM instance from the glance image</p>	<p>1. Get the following configuration values.</p> <p>g. The image ID.</p> <pre>\$ glance image-list</pre> <p>h. The flavor ID.</p> <pre>\$ nova flavor-list</pre> <p>i. The network ID(s)</p> <pre>\$ neutron net-list</pre> <p>j. An informative name for the instance.</p> <p>SOAM1</p> <p>SOAM2</p> <p>2. Create and boot the VM instance.</p> <p>The instance must be owned by the DSR tenant user, not the admin user. Source the credentials of the DSR tenant user and issue the following command. Use one <b>--nic</b> argument for each IP/interface. Number of IP/interfaces for each VM type must conform with the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide.</p> <p><b>Note:</b> IPv6 addresses should use the <b>v6-fixed-ip</b> argument instead of <b>v4-fixed-ip</b>.</p> <pre>\$ nova boot --image &lt;image ID&gt; --flavor &lt;flavor id&gt; --nic net-id=&lt;first network id&gt;,v4-fixed-ip=&lt;first ip address&gt; --nic net-id=&lt;second network id&gt;,v4-fixed-ip=&lt;second ip address&gt; &lt;instance name&gt;</pre> <p>3. View the newly created instance using the nova tool.</p> <pre>\$ nova list --all-tenants</pre> <p>The VM takes approximately 5 minutes to boot and may be accessed through both network interfaces and the Horizon console tool.</p>

STEP #	Procedure	Description
<p>3. <input type="checkbox"/></p>	<p>Configure SOAM VIP (Optional)</p>	<p><b>Note:</b> Refer to Allowed Address Pairs in Appendix G.2 for more information on VIP.</p> <p>If an SOAM VIP is needed, execute the following commands:</p> <ol style="list-style-type: none"> <li>Find the port ID associated with the SOAM instance XMI interface. <code>\$ neutron port-list</code></li> <li>Add the VIP IP address to the address pairs list of the SOAM instance XMI interface port. <code>\$ neutron port-update &lt;Port ID&gt; --allowed_address_pairs list=true type=dict ip_address=&lt;VIP address to be added&gt;</code></li> </ol>
<p>4. <input type="checkbox"/></p>	<p>Check if interface is configured</p>	<p>If DHCP is enabled on Neutron subnet, VM configures the VNIC with the IP address provided in step 2 above.</p> <p>To verify, ping the XMI IP address provided with nova boot... command (step 2): <code>\$ ping &lt;XMI-IP-Provided-During-Nova-Boot&gt;</code></p> <p>If the ping is successful, ignore step 5 to configure the interface manually.</p>
<p>5. <input type="checkbox"/></p>	<p>Manually configure interface, if not already done (Optional)</p>	<p><b>Note:</b> If the instance is already configured with an interface and successfully pinging (step 4), then <b>ignore</b> this step to configure the interface manually.</p> <ol style="list-style-type: none"> <li>Log into the <b>Horizon</b> GUI as the DSR tenant user.</li> <li>Go to the Compute/Instances section.</li> <li>Click the <b>Name</b> field of the newly created instance.</li> <li>Select the Console tab.</li> <li>Login as the <b>admusr</b> user.</li> <li>Configure the network interfaces, conforming with the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide. <code>\$ sudo netAdm add --onboot=yes --device=eth0 --address=&lt;xmi ip&gt; --netmask=&lt;xmi net mask&gt;</code> <code>\$ sudo netAdm add --route=default --device=eth0 --gateway=&lt;xmi gateway ip&gt;</code></li> </ol> <p>Verify network connectivity by pinging Gateway of XMI network. <code>\$ ping -c3 &lt;XMI Gateway&gt;</code></p> <p>Under some circumstances, it may be necessary to configure as many as 6 or more interfaces.</p> <ol style="list-style-type: none"> <li>Reboot the SOAM VM. It takes approximately 5 minutes for the VM to complete rebooting. <code>\$ sudo init 6</code></li> </ol> <p>The new VM should now be accessible via both network and Horizon consoles.</p>

STEP #	Procedure	Description
<p>6.</p> <input type="checkbox"/>	<p>Verify network connectivity</p>	<p>1. Access the <b>SOAM1 VM console</b> using the openstack.                  2. Login as the <b>admusr</b> user.                  3. Ping the NOAM1.</p> <pre>\$ ping -c3 &lt;IP Address in External Management Network&gt;</pre>
<p>7.</p> <input type="checkbox"/>	<p>Procedure overview</p>	<p>Repeat steps 1 through 6 for the following VMs. Use unique labels for the VM names. Assign addresses to all desired network interfaces:</p> <ul style="list-style-type: none"> <li>MP(s)</li> <li>IPFE(s)</li> <li>MP vSTP (For vSTP configuration) (Optional Components)</li> <li>SOAM(s)</li> <li>Session SBRs, Binding SBR (Optional Components)</li> <li>DR NOAMs (Optional Components)</li> </ul>

### 3.3 Create DSR Guests (OVM-S/OVM-M)

#### Procedure 9. (OVM-S/OVM-M). Import DSR OVA and prepare for VM creation

STEP #	Procedure	Description
<p>This procedure imports the DSR image. This procedure requires values for these variables:</p> <ul style="list-style-type: none"> <li>• &lt;OVM-M IP&gt; = IP address to access a sh prompt on the OVM server</li> <li>• &lt;URL to OVA&gt; = link to a source for downloading the product image (.ova)</li> <li>• &lt;MyRepository name&gt; = name of the repository in the OVM to hold the product image (.ova)</li> </ul> <p>Execution of this procedure discovers and uses the values of these variables:</p> <ul style="list-style-type: none"> <li>• &lt;Virtual Appliance OVA ID&gt;</li> <li>• &lt;OVA VM name_vm_vm&gt;</li> <li>• &lt;OVM network id for (each subnet)&gt;</li> <li>• &lt;OVM network name for (each subnet)&gt;</li> </ul> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1. <input type="checkbox"/></p>	<p><b>Preparation:</b> Access command line of OVM</p>	<p>Refer to Common OVM Manager Tasks (CLI) in Appendix D for setting up the platform.</p> <ol style="list-style-type: none"> <li>1. Get the site-specific values for these variables (overwrite example).                      &lt;OVM-M IP&gt; = 100.64.62.221</li> <li>2. Use the respective value for &lt;OVM-M IP&gt; into the command.  <pre>ssh -l admin &lt;OVM-M IP&gt; -p 10000</pre>                     Example:  <pre>ssh -l admin 100.64.62.221 -p 10000</pre>                     Alternatively, use a terminal emulation tool like putty.</li> </ol> 

STEP #	Procedure	Description
<p>2.</p> <p>□</p>	<p><b>OVM-M CLI:</b> Import the VirtualAppliance/OVA</p>	<ol style="list-style-type: none"> <li>Get the site-specific values for these variables (overwrite example).            &lt;URL to OVA&gt; = <code>http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova</code>            &lt;MyRepository name&gt; = <code>XLab Utility Repo01</code></li> <li>Use the respective values for &lt;MyRepository name&gt; and &lt;URL to OVA&gt; into the command.  <pre>OVM&gt; importVirtualAppliance Repository name='&lt;MyRepository name&gt;' url="&lt;URL to OVA&gt;"</pre> <p>Example:</p> <pre>OVM&gt; importVirtualAppliance Repository name='XLab Utility Repo01' url=http://10.240.155.70/iso/DSR/8.5/ova/DSR- 8.5.0.0.0_90.11.0.ova</pre></li> <li>Execute the command and validate success.</li> <li>Examine the screen results to find site-specific text for variables in these locations:  <p>Command: <code>importVirtualAppliance Repository name='XLab Utility Repo01' url=http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova</code>            Status: Success            Time: 2017-04-18 15:23:31,044 EDT            JobId: 1492543363365            Data:                id: <code>1128a1c6ce</code> name: DSR-8.5.0.0.0_90.11.0.ova</p></li> <li>Use the respective values for values for these variables (overwrite example).            &lt;Virtual Appliance OVA ID&gt; = <code>1128a1c6ce</code></li> </ol>

STEP #	Procedure	Description
<p>3.</p> <p>□</p>	<p><b>OVM-M CLI:</b> Get the virtual appliance ID</p>	<p>The virtual appliance OVA ID is used in later steps.</p> <ol style="list-style-type: none"> <li>Get the site-specific text for these variables (overwrite example).  <code>&lt;Virtual Appliance OVA ID&gt; = 1128a1c6ce</code></li> <li>Use the respective values for <code>&lt;Virtual Appliance OVA ID&gt;</code> into the command.  <code>OVM&gt; show VirtualAppliance id=&lt;Virtual Appliance OVA id&gt;</code>                      Example:  <code>OVM&gt; show VirtualAppliance id=1128a1c6ce</code></li> <li>Execute the command and validate success.</li> <li>Examine the screen results to find site-specific text for variables in these locations:                      Command: <code>show VirtualAppliance id=1128a1c6ce</code>                      Status: Success                      Time: 2017-04-18 15:23:53,534 EDT                      Data:  <pre> Origin = http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova Repository = 0004fb0000030000da5738315337bfc7 [XLab Utility Repo01] Virtual Appliance Vm 1 = 11145510c0_vm_vm [vm] Virtual Appliance VirtualDisk 1 = 11145510c0_disk_disk1 [disk1] Id = 11145510c0 [DSR-8.5.0.0.0_90.11.0.ova] Name = DSR-8.5.0.0.0_90.11.0.ova Description = Import URL: http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova Locked = false                     </pre></li> <li>Use the respective values for these variables (overwrite example).  <code>&lt;OVA VM name_vm_vm&gt; = 11145510c0_vm_vm</code></li> </ol>



STEP #	Procedure	Description																								
4.	<b>OVM-M CLI:</b> Determine the OVM network IDs (established during the platform installation)	<p>OVM&gt; <code>list Network</code></p> <ol style="list-style-type: none"> <li>Execute the command and validate success.</li> <li>Examine the screen results to find the find site-specific OVM values for each subnet:                             <ul style="list-style-type: none"> <li>&lt;OVM network ID&gt;</li> <li>&lt;OVM network name&gt;</li> </ul> </li> <li>Note the entire screen results. Refer to this data in later steps.                             <pre>Command: list network Status: Success Time: 2017-04-19 18:51:42,494 EDT Data: id:10486554b5 name:XSI-7 (10.196.237.0/25) id:10f4d5744c name:XMI-11 (10.75.159.0/25) id:10775cf4e5 name:IDIH Internal id:102e89a481 name:IMI Shared (169.254.9.0/24) id:c0a80500 name:192.168.5.0 id:10d8de6d9a name:XSI-6 (10.196.236.128/25) id:10806a91fb name:XSI-8 (10.296.237.128/25) id:10a7289add name:Control DHCP id:1053a604f0 name:XSI-5 (10.196.236.0/25) id:10345112c9 name:XMI-10 (10.75.158.128/25)</pre> </li> <li>Use the respective values for network ID variables (change the examples in this table according to the values).</li> </ol> <table border="1"> <thead> <tr> <th></th> <th>OAM (XMI)</th> <th>Local (IMI)</th> <th>Signaling A (XSI1)</th> <th>Signaling B (XSI2)</th> <th>Signaling C (XSI3-16)</th> <th>Replication (SBR Rep)</th> <th>DIH Internal</th> </tr> </thead> <tbody> <tr> <td>&lt;OVM network name&gt;</td> <td>XMI-10</td> <td>IMI Shared</td> <td>XSI-5</td> <td>XSI-6</td> <td>XSI-7</td> <td>DIH Internal</td> <td>XMI-10</td> </tr> <tr> <td>&lt;OVM network ID&gt;</td> <td>10345112c9</td> <td>102e89a481</td> <td>1053a604f0</td> <td>10d8de6d9a</td> <td></td> <td>10486554b5</td> <td>10775cf4e5</td> </tr> </tbody> </table>		OAM (XMI)	Local (IMI)	Signaling A (XSI1)	Signaling B (XSI2)	Signaling C (XSI3-16)	Replication (SBR Rep)	DIH Internal	<OVM network name>	XMI-10	IMI Shared	XSI-5	XSI-6	XSI-7	DIH Internal	XMI-10	<OVM network ID>	10345112c9	102e89a481	1053a604f0	10d8de6d9a		10486554b5	10775cf4e5
	OAM (XMI)	Local (IMI)	Signaling A (XSI1)	Signaling B (XSI2)	Signaling C (XSI3-16)	Replication (SBR Rep)	DIH Internal																			
<OVM network name>	XMI-10	IMI Shared	XSI-5	XSI-6	XSI-7	DIH Internal	XMI-10																			
<OVM network ID>	10345112c9	102e89a481	1053a604f0	10d8de6d9a		10486554b5	10775cf4e5																			

### 3.4 Configure Virtual Machines

#### Procedure 10. (OVM-S/OVM-M). Configure each DSR VM

STEP #	Procedure	Description
<p>This procedure creates virtual machines. Repeat this procedure for each DSR VM guest that needs to be created. This procedure requires values for these variables:</p> <ul style="list-style-type: none"> <li>• &lt;OVA VM name_vm_vm&gt;</li> <li>• &lt;ServerPool name&gt;</li> <li>• &lt;VM name&gt;</li> <li>• &lt;OVM network ID for XMI&gt;</li> <li>• &lt;OVM network ID for IMI&gt;</li> <li>• &lt;OVM network ID for XSI#&gt; where # is a numeric from 1-16, for the signaling networks</li> <li>• &lt;OVM network ID for Replication XSI#&gt;</li> <li>• &lt;URL for OVM GUI&gt;</li> <li>• &lt;VM IP in XMI&gt; from the NAPD</li> <li>• &lt;Gateway for XMI&gt; from the NAPD</li> <li>• &lt;NetMask for XMI&gt; from the NAPD</li> </ul> <p>Execution of this procedure discovers and uses the values of these variables:</p> <ul style="list-style-type: none"> <li>• &lt;VM ID&gt;</li> <li>• &lt;vCPUs Production&gt;</li> <li>• &lt;VNIC 1 ID&gt;</li> <li>• &lt;interface name&gt; defined in [24] DSR Cloud Benchmarking Guide</li> </ul> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create a VM for each guest from the VM in the OVA virtual appliance</p>	<ol style="list-style-type: none"> <li>1. Get the site-specific text for these variables (overwrite example). &lt;OVA VM name_vm_vm&gt; = 11145510c0_vm_vm</li> <li>2. Use the respective values for &lt;OVA VM name&gt; into the command. <code>OVM&gt; createVmFromVirtualApplianceVm VirtualApplianceVm name=&lt;OVA VM name&gt;</code>  Example: <code>OVM&gt; createVmFromVirtualApplianceVm VirtualApplianceVm name=11145510c0_vm_vm</code></li> <li>3. Execute the command and validate success.</li> <li>4. Examine the screen results to find site-specific text for variables in these locations:  Command: <code>createVmFromVirtualApplianceVm VirtualApplianceVm name=11145510c0_vm_vm</code> Status: Success</li> </ol>

STEP #	Procedure	Description
		<p>Time: 2017-04-18 16:02:09,141 EDT</p> <p>JobId: 1492545641976</p> <p>Data:</p> <p>id: 0004fb00000600004a0e02bdf9fc1bcd name: DSR-8.5.0.0.0_90.11.0.ova_vm</p> <p>5. Use the respective values for these variables (overwrite example).</p> <p>&lt;VM ID&gt; = 0004fb00000600004a0e02bdf9fc1bcd</p>
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Add the VM to the server pool</p>	<p>1. Get the site-specific text for these variables (overwrite example).</p> <p>&lt;VM ID&gt; = 0004fb00000600004a0e02bdf9fc1bcd</p> <p>&lt;ServerPool name&gt; = XLab Pool 01</p> <p>2. Use the respective values for &lt;VM ID&gt; and &lt;ServerPool name&gt; into the command.</p> <pre>OVM&gt; add Vm id=&lt;VM id&gt; to ServerPool name="&lt;ServerPool name&gt;"</pre> <p>Example:</p> <pre>OVM&gt; add Vm id=0004fb00000600004a0e02bdf9fc1bcd to ServerPool name="XLab Pool 01"</pre> <p>3. Execute the command and validate success.</p> <p>Command: add Vm id=0004fb0000060000beeb93da703830d3c to ServerPool name="XLab Pool 01"</p> <p>Status: Success</p> <p>Time: 2017-04-19 21:05:10,950 EDT</p> <p>JobId: 1492650310802</p> <p><b>Note:</b> Refer to the Server Pool section in Appendix D.2 for more information.</p>

STEP #	Procedure	Description												
<p>3.</p> <p>☐</p>	<p><b>OVM-M CLI:</b> Edit VM to apply required profile/resources</p>	<p>1. Get the site-specific text for these variables (overwrite example).</p> <pre>&lt;VM ID&gt; = 0004fb00000600004a0e02bdf9fc1bcd &lt;VM name &gt; = na-noam-na-2a &lt;vCPUs Production&gt; = 4</pre> <p>2. Refer to [24] DSR Cloud Benchmarking Guide for recommended resource.</p> <table border="1"> <thead> <tr> <th>VM Name</th> <th>vCPUs Lab</th> <th>RAM (GB) Lab</th> <th>vCPUs Production</th> <th>RAM (GB) Production</th> <th>Storage (GB) Lab and Production</th> </tr> </thead> <tbody> <tr> <td>Type of guest host</td> <td>#</td> <td>#</td> <td>#</td> <td>#</td> <td>#</td> </tr> </tbody> </table> <p>3. Use the respective values for &lt;VM ID&gt;, &lt;VM name&gt;, and &lt;vCPUs Production&gt; into the command.</p> <pre>OVM&gt; edit Vm id=&lt;VM id&gt; name=&lt;VM name&gt; memory=6144 memoryLimit=6144 cpuCountLimit=&lt;vCPUs Production&gt; cpuCount=&lt;vCPUs Production&gt; domainType=XEN_HVM description="&lt;VM name&gt;"</pre> <p>Example:</p> <pre>OVM&gt; edit Vm id=0004fb00000600004a0e02bdf9fc1bcd name=na-noam-na-2a memory=6144 memoryLimit=6144 cpuCountLimit=4 cpuCount=4 domainType=XEN_HVM description="na-noam-na-2a"</pre> <p>4. Execute the command and validate success.</p> <pre>Command: edit Vm id=0004fb00000600004a0e02bdf9fc1bcd name=na-noam-na-2a memory=6144 memoryLimit=6144 cpuCountLimit=4 cpuCount=4 domainType=XEN_HVM description="na-noam-na-2a" Status: Success Time: 2017-04-18 17:55:25,645 EDT JobId: 1492552525477</pre> <p>Now, the VM has a name and resources.</p>	VM Name	vCPUs Lab	RAM (GB) Lab	vCPUs Production	RAM (GB) Production	Storage (GB) Lab and Production	Type of guest host	#	#	#	#	#
VM Name	vCPUs Lab	RAM (GB) Lab	vCPUs Production	RAM (GB) Production	Storage (GB) Lab and Production									
Type of guest host	#	#	#	#	#									
<p>4.</p> <p>☐</p>	<p><b>OVM-M CLI:</b> Determine VNIC ID</p>	<p>1. Get the site-specific text for these variables (overwrite example).</p> <pre>&lt;VM name&gt; = na-noam-na-2a</pre> <p>2. Use the respective value for &lt;VM name&gt; into the command.</p> <pre>OVM&gt; show Vm name=&lt;VM name&gt;</pre> <p>Example:</p> <pre>OVM&gt; show Vm name=na-noam-na-2a</pre> <p>3. Execute the command and validate success.</p> <p>4. Examine the screen results to find site-specific text for <b>variables</b> in these locations:</p> <pre>Status = Stopped Memory (MB) = 6144</pre>												

STEP #	Procedure	Description
		<pre> Max. Memory (MB) = 6144 Processors = 4 Max. Processors = 4 Priority = 50 Processor Cap = 100 High Availability = No Operating System = Oracle Linux 6 Mouse Type = PS2 Mouse Domain Type = Xen HVM Keymap = en-us Start Policy = Use Pool Policy Origin = http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova Disk Limit = 4 Huge Pages Enabled = No Config File Absolute Path = 192.168.5.5:/storage/ovm01/repository/VirtualMachines/0004fb00000600004a0e02bdf9fc1bcd/vm.cfg Config File Mounted Path = /OVS/Repositories/0004fb0000030000da5738315337bfc7/VirtualMachines/0004fb00000600004a0e02bdf9fc1bcd/vm.cfg Server Pool = 0004fb00000200009148c8926d307f05 [XLab Pool 01] Repository = 0004fb0000030000da5738315337bfc7 [XLab Utility Repo01] Vnic 1 = 0004fb0000070000091e1ab5ae291d8a [Template Vnic] VmDiskMapping 1 = 0004fb0000130000a1996c6074d40563 [Mapping for disk Id (79def426328a4127b5bf9f7ae53d3f48.img)] VmDiskMapping 2 = 0004fb00001300002db3d4b67a143ab5 [Mapping for disk Id (EMPTY_CDROM)] Restart Action On Crash = Restart Id = 0004fb00000600004a0e02bdf9fc1bcd [na-noam-na-2a] Name = na-noam-na-2a Description = na-noam-na-2a Locked = false DeprecatedAttrs = [Huge Pages Enabled (Deprecated for PV guest)]                     </pre> <p>5. Use the respective values for these variables (overwrite example).</p>

STEP #	Procedure	Description																
		<Vnic 1 ID> = 0004fb0000070000091e1ab5ae291d8a																
5. <input type="checkbox"/>	Determine network interfaces for the type of guest host	<p>Refer to [24] DSR Cloud Benchmarking Guide to learn which network interfaces need to be configured for each guest type. The table looks like this:</p> <table border="1"> <thead> <tr> <th></th> <th>OAM (XMI)</th> <th>Local (IMI)</th> <th>Sig A (XSI1)</th> <th>Sig B (XSI2)</th> <th>Sig C (XSI3-16)</th> <th>Rep (SBR)</th> <th>DIH Internal</th> </tr> </thead> <tbody> <tr> <td>Type of guest host</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> </tr> </tbody> </table> <p><b>Note:</b> The VNICs need to be created in the correct order so the interfaces are associated with the correct network.</p>		OAM (XMI)	Local (IMI)	Sig A (XSI1)	Sig B (XSI2)	Sig C (XSI3-16)	Rep (SBR)	DIH Internal	Type of guest host	eth#	eth#	eth#	eth#	eth#	eth#	eth#
	OAM (XMI)	Local (IMI)	Sig A (XSI1)	Sig B (XSI2)	Sig C (XSI3-16)	Rep (SBR)	DIH Internal											
Type of guest host	eth#	eth#	eth#	eth#	eth#	eth#	eth#											
6. <input type="checkbox"/>	<b>OVM-M CLI:</b> Attach XMI VNIC (if required by guest host type)	<p><b>Add (attach) VNIC ID of the XMI network to VM:</b></p> <ol style="list-style-type: none"> <li>Get the site-specific text for these variables (overwrite example)                      &lt;VNIC 1 ID&gt; = 0004fb0000070000091e1ab5ae291d8a                      &lt;OVM network ID for XMI&gt; = 10345112c9</li> <li>Use the respective values for &lt;VNIC 1 ID&gt; and &lt;OVM network ID for XMI&gt; into the command  <pre>OVM&gt; add Vnic ID=&lt;Vnic 1 ID&gt; to Network name=&lt;OVM network ID for XMI&gt;</pre> <p><b>Example:</b></p> <pre>OVM&gt; add Vnic ID=0004fb0000070000091e1ab5ae291d8a to Network name=10345112c9</pre> </li> <li>Execute the command and validate success.  <p><b>Command:</b> add Vnic id=0004fb0000070000091e1ab5ae291d8a to Network name=10345112c9                      Status: Success                      Time: 2017-04-19 19:08:59,496 EDT                      JobId: 1492643339327</p> </li> </ol>																

STEP #	Procedure	Description
<p>7.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create and attach IMI VNIC (if required by guest host type)</p>	<p><b>Create VNIC ID on the IMI network and attach to VM:</b></p> <ol style="list-style-type: none"> <li>Get the site-specific text for these variables (overwrite example).  <code>&lt;VM name&gt; = na-noam-na-2a</code>  <code>&lt;OVM network ID for IMI&gt; = 102e89a481</code></li> <li>Use the respective values for <code>&lt;OVM network ID for IMI&gt;</code> and <code>&lt;VM name&gt;</code> into the command.  <pre>OVM&gt; create Vnic network=&lt;OVM network ID for IMI&gt; name=&lt;VM name&gt;-IMI on Vm name=&lt;VM name&gt;</pre> <p><b>Example:</b></p> <pre>OVM&gt; create Vnic network=102e89a481 name=na-noam-na-2a- IMI on Vm name=na-noam-na-2a</pre></li> <li>Execute the command and validate success.  <p><b>Command:</b> <code>create Vnic network=102e89a481 name=na-noam-na-2a-IMI on Vm name=na-noam-na-2a</code>  <b>Status:</b> Success  <b>Time:</b> 2017-04-19 21:21:57,363 EDT  <b>JobId:</b> 1492651317194  <b>Data:</b></p> <pre>id:0004fb00000700004f16dc3bfe0750a7  name:na-noam-na-2a- IMI</pre></li> </ol>
<p>8.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create and attach XSI VNIC(s) (if required by guest host type)</p> <p><b>Note:</b> Repeat this step if the VM will have multiple signaling networks, specifying the number of the network</p>	<p><b>Create VNIC ID on the XSI network(s) and attach to VM:</b></p> <ol style="list-style-type: none"> <li>Get the site-specific text for these variables (overwrite example).  <code>&lt;VM name&gt; = hostname</code>  <code>&lt;OVM network ID for XSI#&gt; = 1053a604f0</code>  <code>&lt;#&gt; = the number of the XSI network [1-16]</code></li> <li>Use the respective values for <code>&lt;OVM network ID for XSI#&gt;</code> and <code>&lt;VM name&gt;</code> into the command.  <pre>OVM&gt; create Vnic network=&lt;OVM network id for XSI#&gt; name=&lt;VM name&gt;-XSI&lt;#&gt; on Vm name=&lt;VM name&gt;</pre> <p><b>Example:</b></p> <pre>OVM&gt; create Vnic network=1053a604f0 name=hostname-XSI1 on Vm name=hostname</pre></li> <li>Execute the command and validate success.</li> </ol>

STEP #	Procedure	Description
<p>9.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create and attach replication VNIC (if required by guest host type)</p>	<p><b>Create VNIC ID on the Replication network and attach to VM:</b></p> <ol style="list-style-type: none"> <li>1. Get the site-specific text for these variables (overwrite example).  <code>&lt;VM name&gt; = hostname</code>  <code>&lt;OVM network ID for Replication XSI#&gt; = 10486554b5</code>  <code>&lt;OVM network name for Replication XSI#&gt; = XSI7</code>  <code>&lt;#&gt; = the number of the XSI Replication network [1-16]</code> </li> <li>2. Use the respective values for <code>&lt;OVM network ID for Replication XSI#&gt;</code>, <code>&lt;OVM network name for Replication XSI#&gt;</code>, and <code>&lt;VM name&gt;</code> into the command.   <pre>OVM&gt; create Vnic network=&lt;OVM network id for Replication XSI#&gt; name=&lt;VM name&gt;-&lt;OVM network name for Replication XSI#&gt; on Vm name=&lt;VM name&gt;</pre> <p>Example:</p> <pre>OVM&gt; create Vnic network=10486554b5 name= hostname-XSI7 on Vm name=hostname</pre> </li> <li>3. Execute the command and validate success.</li> </ol>
<p>10.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Start VM</p>	<ol style="list-style-type: none"> <li>1. Get the site-specific text for these variables (overwrite example).  <code>&lt;VM name&gt; = na-noam-na-2a</code> </li> <li>2. Use the respective values for <code>&lt;VM name&gt;</code> into the command.   <pre>OVM&gt; start Vm name=&lt;VM name&gt;</pre> <p>Example:</p> <pre>OVM&gt; start Vm name=na-noam-na-2a</pre> </li> <li>3. Execute the command and validate success.   <p>Command: <code>start Vm name=na-noam-na-2a</code>  Status: Success  Time: 2017-04-19 19:29:35,376 EDT  JobId: 1492644568558</p> </li> </ol>



STEP #	Procedure	Description
11. <input type="checkbox"/>	<b>OVM-M GUI:</b> Configure the XMI network interface for this VM	<ol style="list-style-type: none"> <li>1. Get the site-specific text for these variables (overwrite example).            &lt;URL for OVM GUI&gt; = <a href="https://100.64.62.221:7002/ovm/console/faces/resource/resourceView.jspx">https://100.64.62.221:7002/ovm/console/faces/resource/resourceView.jspx</a>            &lt;interface name&gt; = from the table in [24] DSR Cloud Benchmarking Guide            &lt;VM IP in XMI&gt; = from the NAPD            &lt;Gateway for XMI&gt; = from the NAPD            &lt;NetMask for XMI&gt; = from the NAPD</li> <li>2. Access the CLI of the console for the VM:</li> <li>3. Log into the <b>OVM-M</b> GUI by typing the &lt;URL for OVM GUI&gt; into a browser.           <ol style="list-style-type: none"> <li>k. Navigate to the Servers and VMs tab.</li> <li>l. Expand and select the &lt;ServerPool name&gt;.</li> <li>m. From the <b>Perspective</b> list, select <b>Virtual Machines</b>.</li> <li>n. Select the &lt;VM name&gt; from the rows listed, and click the <b>Launch Console</b> icon.</li> <li>o. In the Console window, log into the VM as the admusr.</li> </ol> </li> <li>4. Use the respective values for &lt;interface name&gt;, &lt;VM IP in XMI&gt;, &lt;Gateway for XMI&gt;, and &lt;NetMask for XMI&gt; into the commands  <b>XMI:</b>  <pre>\$ sudo netAdm set --onboot=yes --device=&lt;interface name&gt; --address=&lt;VM IP in XMI&gt; --netmask=&lt;NetMask for XMI&gt;</pre> <pre>\$ sudo netAdm add --route=default --device=&lt;interface name&gt; -gateway=&lt;Gateway for XMI&gt;</pre> <p>Example:</p> <pre>\$ sudo netAdm set --onboot=yes --device=eth0 -- address=10.75.158.189 --netmask=255.255.255.128</pre> <p>Example:</p> <pre>\$ sudo netAdm add --route=default --device=eth0 -- gateway=10.75.158.129</pre> </li> <li>5. Execute the command and validate success</li> <li>6. Verify network connectivity by pinging Gateway of network  <pre>\$ ping -c3 &lt;Gateway for XMI&gt;</pre> </li> <li>7. Reboot the VM. It takes approximately 5 minutes for the VM to complete rebooting.  <pre>\$ sudo init 6</pre> </li> </ol> <p>The new VM should now be accessible via both network and console.</p>

### 3.5 DSR Installation on OL7 and KVM

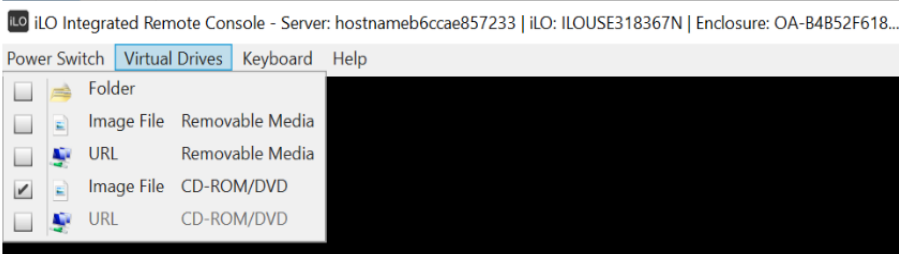
DSR Installation on OL7 and KVM includes the following procedures:

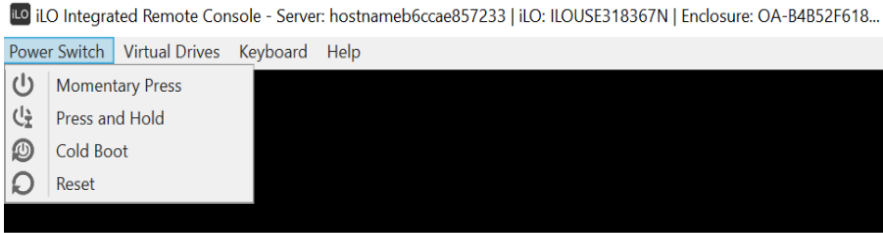
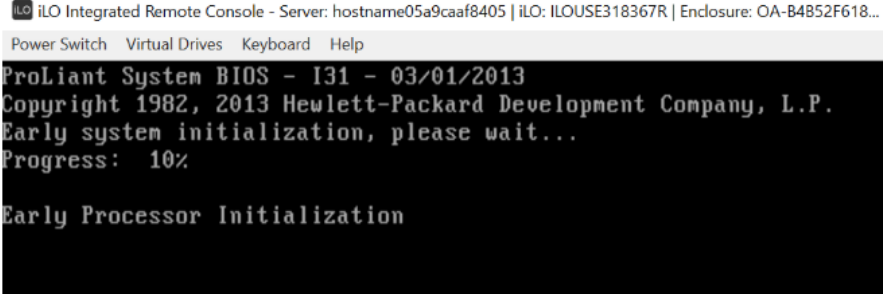

- Install DSR on Oracle Linux/KVM
- Create and Install OCDSR VMs via KVM GUI

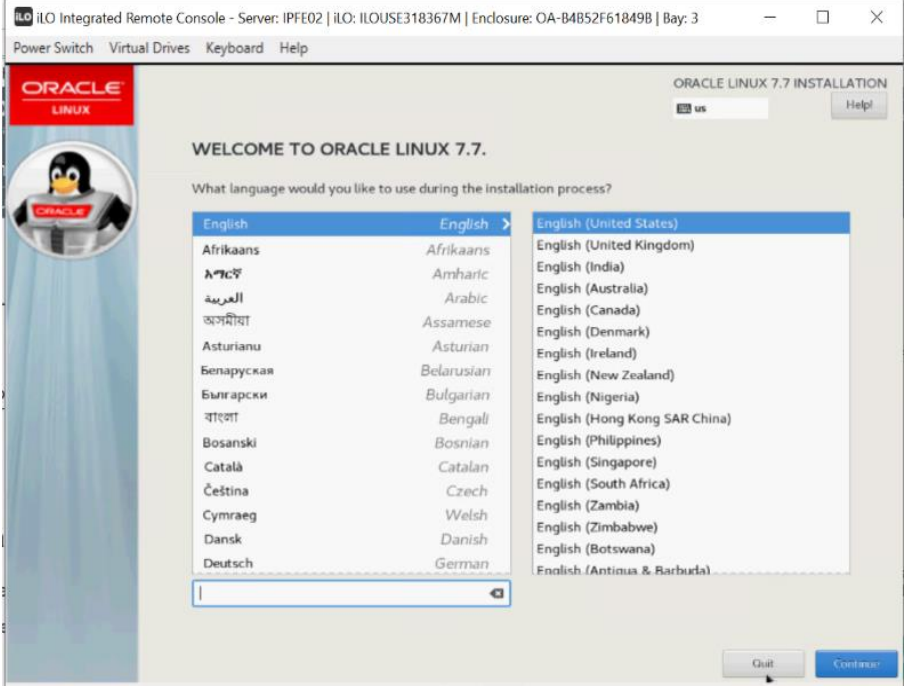
**Note:** If using a hardware in remote LAB then use a remote windows machine to install Linux. Please ensure that OEL 7 ISO is also located locally in remote windows machine.

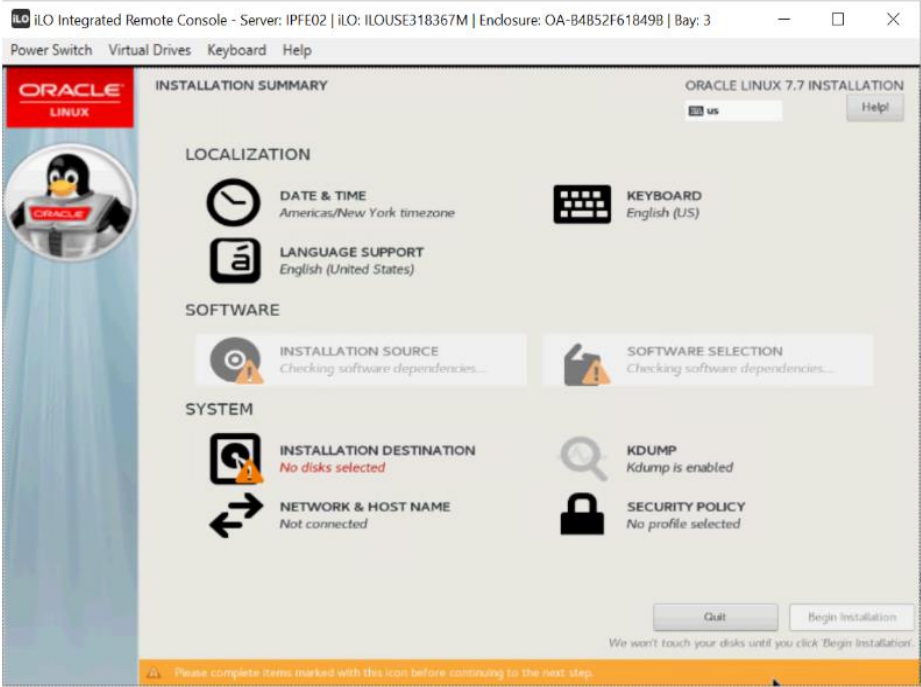
#### 3.5.1 DSR Installation on OL7 and KVM

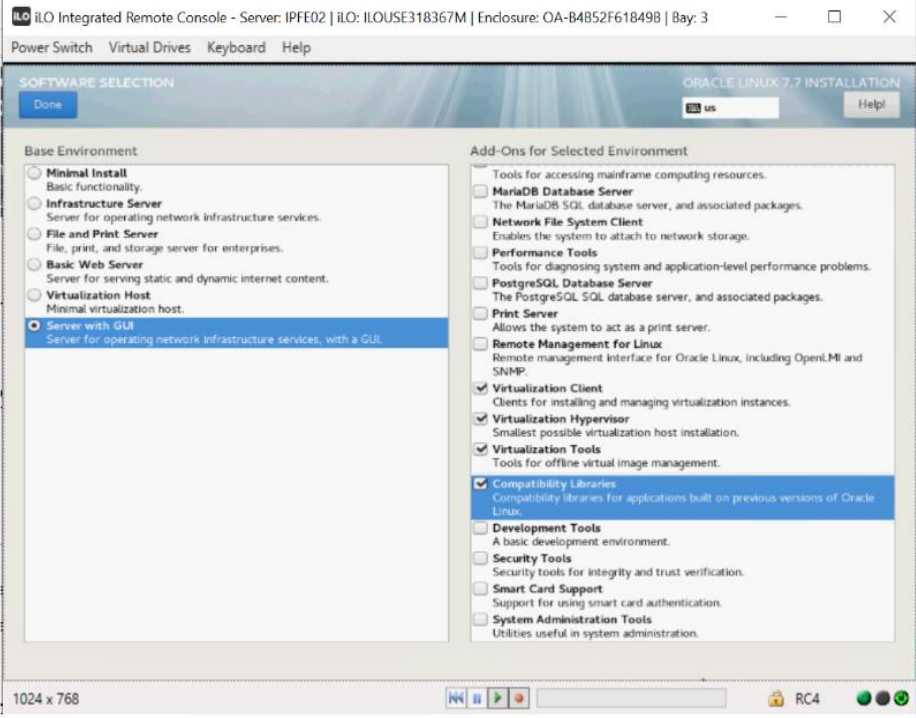
##### Procedure 11. Install DSR on Oracle Linux/KVM

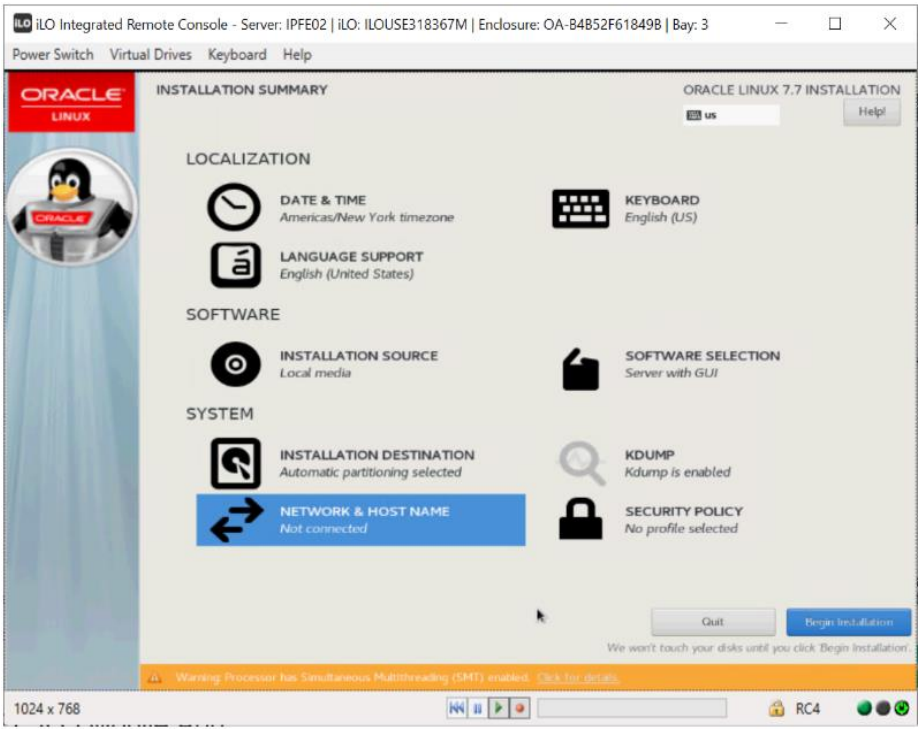
STEP #	Procedure	Description
<p>This procedure will install DSR configuration on Oracle Linux OS with direct KVM as hypervisor.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• This installation procedure only applies when installing DSR on Oracle Linux OS via direct KVM</li> <li>• For the Oracle Linux OS, Oracle Linux 7.7 release is used and verified OK.</li> <li>• The snapshot used for this procedure has been taken from HP Gen-10 Blade.</li> <li>• This procedure can be executed on any flavor of blade that require DSR install on OL7.7 and KVM.</li> </ul> <p><b>Prerequisite:</b> All the respective infrastructures has to be up and running.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>12.</p> <input type="checkbox"/>	<p>For each <b>Blade:</b></p> <p>Mount virtual media contains Oracle Linux OS software</p>	<p>Follow steps defined in Mounting Virtual Media on Blade:</p> <ul style="list-style-type: none"> <li>• Open the ILO.</li> <li>• Attach the OEL 7.7 ISO in ILOs virtual drives-&gt;Image File CD/DVD ROM.</li> </ul> <p>To mount the Oracle Linux OS software ISO from ILO GUI:</p> <ul style="list-style-type: none"> <li>• Navigate to <b>Virtual drives -&gt; menu,</b></li> <li>• Click on <b>Image File</b> then select image from folder.</li> </ul> 
<p>13.</p> <input type="checkbox"/>	<p>For each <b>Blade:</b></p> <p>Reboot host</p> <p>Login to Blade Server</p>	<p>To reboot host:</p> <p>Click <b>Power Switch</b> and select <b>Reset</b> from the dropdown menu.</p>

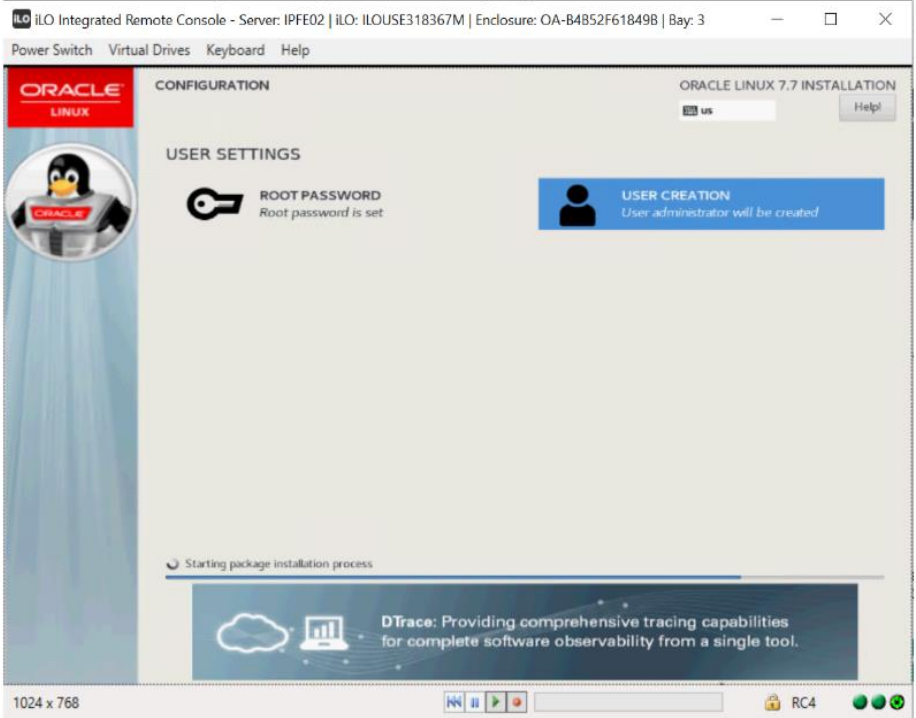
STEP #	Procedure	Description
	ILo GUI browser page and launch remote console	 <p>The remote console window displays that the host is rebooting.</p>  <p>Wait for a couple of minutes for reboot to complete.</p>
14. <input type="checkbox"/>	For each Blade:  Initiate Oracle Linux Platform installation	<p>Once reboot completes, the host boots with Oracle Linux installation ISO and the GUI screen prompts for the installation options.</p> 

STEP #	Procedure	Description
		Select <b>Install Oracle Linux 7.x</b> to continue.
<p>15.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Choose Oracle Linux OS language</p>	<p>When prompted, select <b>English</b> as Oracle Linux OS language:</p>  <p>Press <b>Continue</b> to go to next step.</p>
<p>16.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Setup time zone</p>	<p>The next page <b>INSTALLATION SUMMARY</b> displays the required information to start installation.</p>

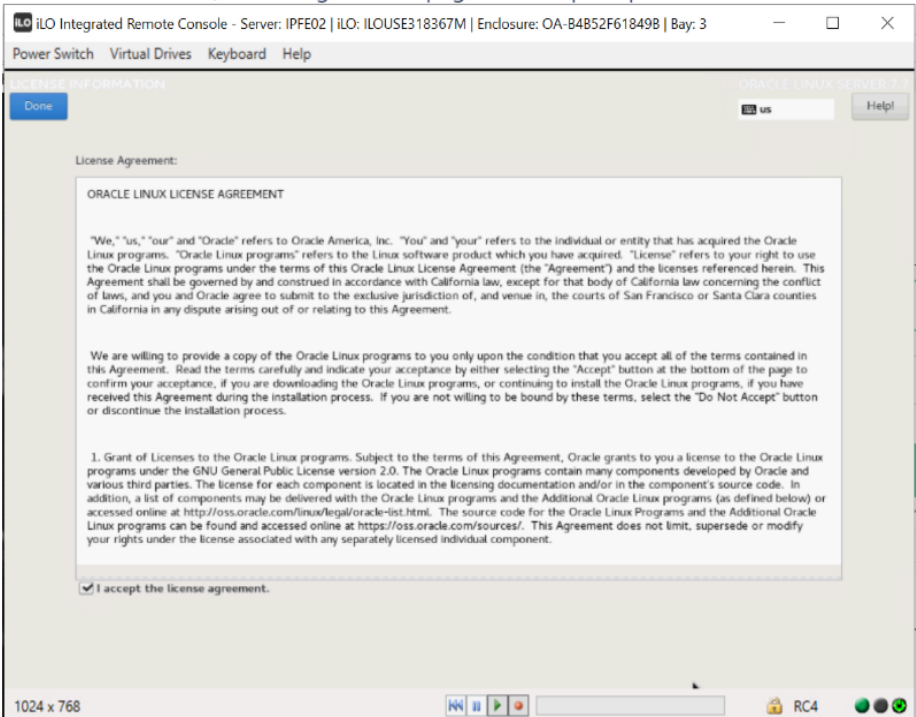
STEP #	Procedure	Description
		 <p>Click <b>LOCALIZATION -&gt; DATE &amp; TIME</b>:</p> <ul style="list-style-type: none"> <li>• Pick a time zone by selecting a region and city from the drop-down lists, or by clicking a location on the map.</li> <li>• Choose a country and city that are in the same time zone as your system.</li> </ul> <p>You need to specify a time zone even if you intend to use the Network Time Protocol (NTP) to set the time on the system. Before you can enable NTP, ensure that the system is connected to a network by selecting the <b>Network &amp; Hostname</b> option on the <b>INSTALLATION SUMMARY</b> screen (see <b>Configuring the Host Name and Connecting to a Network</b>).</p> <p>To enable NTP,</p> <ul style="list-style-type: none"> <li>• Switch <b>ON</b> the <b>Network Time</b></li> <li>• Click the <b>Settings</b> button to display a dialog where you can configure the NTP servers used by the system</li> </ul> <p>To set the date and time manually:</p> <ul style="list-style-type: none"> <li>• Switch <b>OFF</b> the <b>Network Time</b></li> <li>• Adjust the date and time at the bottom of the screen if needed.</li> </ul> <p>Click <b>Done</b> to save your configuration and return to the <b>INSTALLATION SUMMARY</b> screen.</p>
<p>17. <input type="checkbox"/></p>	<p>For each <b>Blade</b>:  Setup</p>	<p>Click <b>SOFTWARE SELECTION</b> options in the <b>SOFTWARE</b> area. Select <b>Server with GUI</b> from the <b>Base Environment</b> area, and ensure that the following add-ons are selected:</p>

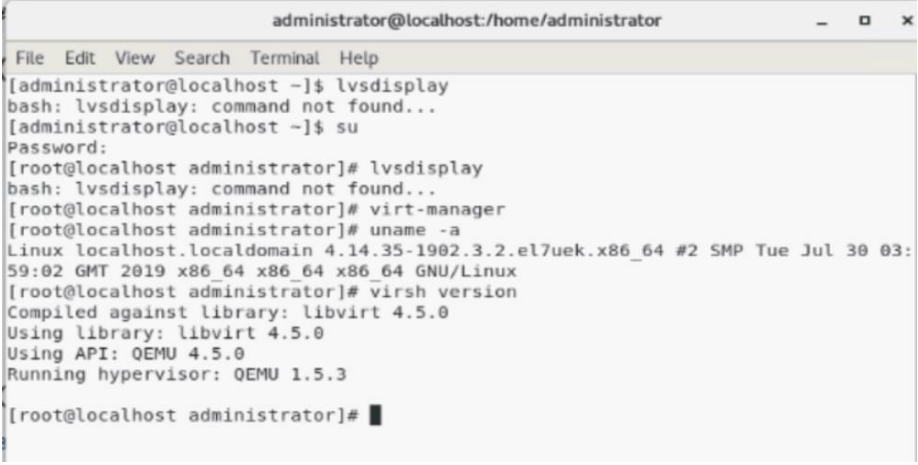
STEP #	Procedure	Description
	installation base environment	<ul style="list-style-type: none"> <li>• Virtualization Client</li> <li>• Virtualization Hypervisor</li> <li>• Virtualization Tools</li> <li>• Compatibility Libraries</li> </ul>  <p>Click <b>Done</b> to save the changes and go back to the main configuration page.</p>
18. <input type="checkbox"/>	For each <b>Blade:</b>  Setup installation destination	Click <b>INSTALLATION DESTINATION</b> in the <b>SYSTEM</b> area. <ul style="list-style-type: none"> <li>• Select 'sda' (or 'sdb') to use</li> <li>• Check <b>Automatically configure partitioning</b></li> <li>• Click <b>Done</b> to continue</li> </ul>

STEP #	Procedure	Description
		
<p>19.</p> <p><input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Review configuration and start installation</p>	<p>Review all the information and click <b>Begin Installation</b>.</p> <p><b>Note:</b> Network configuration is not mandatory at this point and can be performed after Oracle Linux OS is installed.</p> 

STEP #	Procedure	Description
<p>20. <input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Create login credential</p>	<p>At the same time Oracle Linux installation software is laying down files into Gen 10 local hard disk, you may configure root credential or any other login credentials as per the requirement:</p>  <p>The screenshot shows the Oracle Linux 7.7 installation configuration interface. The window title is 'iLO Integrated Remote Console - Server: IPFE02   iLO: ILOUSE318367M   Enclosure: OA-B4852F61849B   Bay: 3'. The main content area is titled 'CONFIGURATION' and 'ORACLE LINUX 7.7 INSTALLATION'. Under 'USER SETTINGS', there is a 'ROOT PASSWORD' section with a key icon and the text 'Root password is set'. To the right, there is a 'USER CREATION' section with a person icon and the text 'User administrator will be created'. At the bottom, there is a progress bar labeled 'Starting package installation process' and a banner for 'DTrace: Providing comprehensive tracing capabilities for complete software observability from a single tool.' The window also shows a 'Power Switch' menu, 'Virtual Drives', 'Keyboard', and 'Help' options. The bottom status bar displays '1024 x 768', 'RC4', and system icons.</p>
<p>21. <input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Reboot host after installation completed</p>	<p>Wait for the installation to complete, until the following screen appears:</p>



STEP #	Procedure	Description
		 <p>Click <b>Reboot</b> button to reboot.</p>
<p>22. <input type="checkbox"/></p>	<p>For each <b>Blade:</b></p> <p>Read &amp; Accept license agreement</p>	<p>After reboot is done, license agreement page appears:</p>  <p>Check "I accept the license agreement", following with "Finish"</p>

STEP #	Procedure	Description
		<p>Configuration" to continue.</p> <p>Skip when prompted for ULN settings.</p>
<p>23.</p> <p><input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Verify kernel version and KVM version</p>	<p>Open SSH console window and check following:</p>  <pre> administrator@localhost:/home/administrator File Edit View Search Terminal Help [administrator@localhost ~]\$ lvsdisplay bash: lvsdisplay: command not found... [administrator@localhost ~]\$ su Password: [root@localhost administrator]# lvsdisplay bash: lvsdisplay: command not found... [root@localhost administrator]# virt-manager [root@localhost administrator]# uname -a Linux localhost.localdomain 4.14.35-1902.3.2.el7uek.x86_64 #2 SMP Tue Jul 30 03:59:02 GMT 2019 x86_64 x86_64 x86_64 GNU/Linux [root@localhost administrator]# virsh version Compiled against library: libvirt 4.5.0 Using library: libvirt 4.5.0 Using API: QEMU 4.5.0 Running hypervisor: QEMU 1.5.3  [root@localhost administrator]# </pre>
<p>24.</p> <p><input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Change network interface name pattern to <b>ethx</b></p>	<p>Edit /etc/default/grub to append 'net.ifnames=0' with option GRUB_CMDLINE_LINUX:</p> <pre>[root@localhost ~]# cat /etc/default/grub</pre> <pre> GRUB_TIMEOUT=5 GRUB_DISTRIBUTOR="\$(sed 's, release .*\$,,g' /etc/system-release)" GRUB_DEFAULT=saved GRUB_DISABLE_SUBMENU=true GRUB_TERMINAL_OUTPUT="console" GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=ol/root rd.lvm.lv=ol/swap rhgb iet net.ifnames=0" GRUB_DISABLE_RECOVERY="true" </pre> <p>Recreate the grub2 config file by executing:</p> <pre>grub2-mkconfig -o /boot/grub2/grub.cfg</pre> <p>Restart host and verify that the network interfaces have <b>ethx</b> name pattern, by executing:</p> <pre>shutdown -r</pre>
<p>25.</p> <p><input type="checkbox"/></p>	<p><b>For each Blade:</b></p> <p>Create bond0 device</p>	<p>5. Create device bond0 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-bond0</pre> <pre> [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond0 DEVICE=bond0 TYPE=Bonding BOND_INTERFACES=eth0,eth1 ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BONDING_OPTS="mode=active-backup primary=eth0 miimon=100" </pre> <p>Save the file and exit.</p>

STEP #	Procedure	Description
		<p>6. Create device eth0 configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-eth0 [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre>           Save the file and exit.</p> <p>7. Create device eth1 configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-eth1 [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth1 DEVICE=eth1 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre>           Save the file and exit.</p> <p>8. Bring up devices into services:  <pre>[root@DSR-Gen10-017 ~]# ifup eth0 [root@DSR-Gen10-017 ~]# ifup eth1 [root@DSR-Gen10-017 ~]# ifup bond0 [root@DSR-Gen10-017 ~]# _</pre></p>
<p>26.  <input type="checkbox"/></p>	<p>For each  <b>Blade:</b>             Create IMI            bridge</p>	<p>4. Create bond0.&lt;imi_vlan&gt; configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-bond0.&lt;imi_vlan&gt; [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre></p> <p>5. Create imi device configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-imi [root@DSR-Gen10-017 ~]# vim /etc/sysconfig/network-scripts/ifcfg-imi DEVICE=imi TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE_INTERFACES=bond0.4</pre></p> <p>6. Bring up devices into services:  <pre>[root@DSR-Gen10-017 ~]# ifup bond0.4 [root@DSR-Gen10-017 ~]# ifup imi [root@DSR-Gen10-017 ~]# _</pre></p>
<p>27.</p>	<p>For each  <b>Blade:</b></p>	<p>5. Create bond0.&lt;xmi_vlan&gt; configuration file:  <pre>vim /etc/sysconfig/network-scripts/ifcfg-</pre></p>

STEP #	Procedure	Description
<input type="checkbox"/>	<p>Create XMI bridge</p>	<pre>bond0.&lt;xmi_vlan&gt; [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond0.3 DEVICE=bond0.3 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE=xmi VLAN=yes</pre> <p>6. Create xmi device configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-xmi [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-xmi DEVICE=xmi TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none NETMASK=255.255.255.128 IPADDR=10.75.193.196 NETWORK=10.75.193.128 GATEWAY=10.75.193.129 BRIDGE_INTERFACES=bond0.3</pre> <p>7. Set default route for xmi network:</p> <pre>vim /etc/sysconfig/network-scripts/route-xmi default via &lt;xmi_gateway&gt; table main [root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/route-xmi default via 10.75.193.196 table main</pre> <p>8. Bring up the devices into service:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup bond0.3 [root@DSR-Gen10-ol7 ~]# ifup xmi [root@DSR-Gen10-ol7 ~]#</pre>
<p>28.</p> <input type="checkbox"/>	<p>For each Blade:  Create bond1 device</p>	<p>5. Create device bond1 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-bond1</pre> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond1 DEVICE=bond1 TYPE=Bonding BOND_INTERFACES=eth2,eth3 ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BONDING_OPTS="mode=active-backup primary=eth2 miimon=100"</pre> <p>6. Create device eth2 configuration file:</p> <pre>vim /etc/sysconfig/network-scripts/ifcfg-eth2</pre> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth2 DEVICE=eth2 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond1 SLAVE=yes</pre>

STEP #	Procedure	Description
		<p>7. Create device eth3 configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-eth3</code></p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-eth3 DEVICE=eth3 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond1 SLAVE=yes</pre> <p>8. Bring up devices into services:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup eth2 [root@DSR-Gen10-ol7 ~]# ifup eth3 [root@DSR-Gen10-ol7 ~]# ifup bond1 [root@DSR-Gen10-ol7 ~]#</pre>
<p>29.  <input type="checkbox"/></p>	<p>For each Blade:             Create xsi1/xsi2 bridge</p>	<p>4. Create device bond1.&lt;xsi1_vlan&gt; configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-bond1.&lt;xsi1_vlan&gt;</code></p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond1.5 DEVICE=bond1.5 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE=xsi1 VLAN=yes</pre> <p>5. Create device xsi1 configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-xsi1</code></p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-xsi1 DEVICE=xsi1 TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE_INTERFACES=bond1.5</pre> <p>6. Bring up devices into services:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup xsi1 [root@DSR-Gen10-ol7 ~]# ifup bond1.5</pre> <p>Perform similar operations to create network devices for xsi2</p> <p>4. Create device bond1.&lt;xsi1_vlan&gt; configuration file:  <code>vim /etc/sysconfig/network-scripts/ifcfg-bond1.&lt;xsi2_vlan&gt;</code></p>

STEP #	Procedure	Description
		<pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond1.6 DEVICE=bond1.6 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE=xsi2 VLAN=yes</pre> <p>5. Create device xsi1 configuration file: vim /etc/sysconfig/network-scripts/ifcfg-xsi2</p> <pre>[root@DSR-Gen10-ol7 ~]# vim /etc/sysconfig/network-scripts/ifcfg-xsi2 DEVICE=xsi2 TYPE=Bridge ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BRIDGE_INTERFACES=bond1.6</pre> <p>6. Bring up devices into services:</p> <pre>[root@DSR-Gen10-ol7 ~]# ifup xsi2 [root@DSR-Gen10-ol7 ~]# ifup bond1.6 [root@DSR-Gen10-ol7 ~]# _</pre>
<p>30. <input type="checkbox"/></p>	<p>For each <b>Blade:</b>  Set host name</p>	<p>Rename host by modifying /etc/hostname file:</p> <pre>[root@localhost ~]# cat /etc/hostname DSR-Gen10-ol7 [root@localhost ~]#</pre> <p>Review host name change with following command:</p> <pre>[root@localhost ~]# hostnamectl status Static hostname: DSR-Gen10-ol7 Icon name: computer-server Chassis: server Machine ID: 0feb15c7d858467995a403846cc779c4 Boot ID: 3538d11fb3004079b1164ca646b924a7 Operating System: Oracle Linux Server 7.7 CPE OS Name: cpe:/o:oracle:linux:7:7:server Kernel: Linux 4.14.35-1902.3.2.el7uek.x86_64 Architecture: x86-64 [root@localhost ~]#</pre>
<p>31. <input type="checkbox"/></p>	<p>For each <b>Blade:</b>  Set NTP service</p>	<p>Modify /etc/chrony.conf, comment out all server * entries and append your NTP server IP to the list with prepending 'server ' text:</p> <pre># Use public servers from the pool.ntp.org project. # Please consider joining the pool (http://www.pool.ntp.org/join.html). #server 0.pool.ntp.org iburst #server 1.pool.ntp.org iburst #server 2.pool.ntp.org iburst #server 3.pool.ntp.org iburst server 10.250.32.10</pre> <p>Force ntp to sync with newly added server:</p>

STEP #	Procedure	Description
		<pre> 4. \$ ntpdate 10.250.32.10 5. \$ timedatectl 6. \$ chronyc tracking  Verify time synced:  [root@localhost ~]# chronyc tracking Reference ID      : 0AFA200A (10.250.32.10) Stratum          : 4 Ref time (UTC)   : Tue Mar 17 17:53:37 2020 System time      : 0.000019021 seconds fast of NTP time Last offset      : +0.000024270 seconds RMS offset       : 0.000036262 seconds Frequency        : 0.478 ppm slow Residual freq    : +0.022 ppm Skew             : 0.381 ppm Root delay       : 0.037895955 seconds Root dispersion  : 0.052380055 seconds Update interval  : 64.8 seconds Leap status      : Normal [root@localhost ~]# </pre>
<p>32.</p> <input type="checkbox"/>	<p>For each Blade: Create ova dir</p>	<p>Create /home/ova dir:</p> <pre> [root@DSR-Gen10-ol7 ~]# mkdir /home/ova/ [root@DSR-Gen10-ol7 ~]# cd /home/ova/ [root@DSR-Gen10-ol7 ova]# </pre>
<p>33.</p> <input type="checkbox"/>	<p>Transfer OVA file dir</p>	<p>Transfer OVA file dir using sftp tool:</p> <pre> [root@DSR-Gen10-ol7 ova]# ll total 36911960 -rw-r--r--. 1 root root 1653708800 Mar 14 16:02 DSR-8.4.0.0_84.17.0.ova </pre>
<p>34.</p> <input type="checkbox"/>	<p>Untar the ova file</p>	<p>Untar the ova file:</p> <pre> [root@DSR-Gen10-ol7 ova]# tar xvf DSR-8.4.0.0_84.17.0.ova DSR-84_17_0.ovf DSR-84_17_0.mf DSR-84_17_0.vmdk [root@DSR-Gen10-ol7 ova]# </pre>
<p>35.</p> <input type="checkbox"/>	<p>Convert the vmdk file to qcow2 file</p>	<p>Convert the vmdk file to qcow2 file:</p> <pre> [root@DSR-Gen10-ol7 ova]# qemu-img convert -O qcow2 DSR-84_17_0.vmdk DSRN0-84_17_0.qcow2 [root@DSR-Gen10-ol7 ova]# </pre>
<p>36.</p> <input type="checkbox"/>	<p>Copy the qcow2 files for SO and MP</p>	<p>Copy the qcow2 files for SO and MP:</p> <pre> [root@DSR-Gen10-ol7 ova]# cp DSRN0-84_17_0.qcow2 DSR50-84_17_0.qcow2 [root@DSR-Gen10-ol7 ova]# cp DSRN0-84_17_0.qcow2 DSRMP-84_17_0.qcow2 </pre>

STEP #	Procedure	Description
<p>37. <input type="checkbox"/></p>	<p>Configure storage for corresponding qcow2 files</p>	<p>Configure storage qcow2 files as per corresponding VMs. Refer VM Resource Profile Flavor section to get the required storage.</p> <p>To set the storage for each VM, execute:</p> <pre>qemu-img resize &lt;NO_qcow2_filename&gt;.qcow2 &lt;storage_in_gigabytes&gt;G</pre> <p>Run the command for a VM if storage required is &gt;60G. No need to run this command if the storage required is 60G.</p> <p>For example:</p> <p>If resource profile is 2K Sh and VM is NOAMP, whereas the storage required is 70G, execute:</p> <pre>qemu-img resize DSRNO-84_17_0.qcow2 70G</pre> <p>For multiqueue setting refer to Appendix I.3. For Ring buffer, refer Appendix I.4</p>
<p>38. <input type="checkbox"/></p>	<p>Set the txqueue length for the ether-net adapter to a high value on the host machine</p>	<p>Add below script to the above created file /sbin/ifup-local:</p> <pre>[root@DSR-Gen10-ol7 ova]# vim /sbin/ifup-local</pre> <pre>ifconfig eth0 txqueuelen 120000 ifconfig eth1 txqueuelen 120000 ifconfig eth2 txqueuelen 120000 ifconfig eth3 txqueuelen 120000</pre>
<p>39. <input type="checkbox"/></p>	<p>Verify txqueue length for the ether-net adapter to a high value on the host machine that is added on all interfaces</p>	<p>Verify txqueue length for the ether-net adapter to a high value on the host machine that is added on all interfaces:</p> <pre>[root@DSR-Gen10-ol7 ova]# ifconfig &lt;ethernet adapter&gt;</pre> <p>Verify same for eth1, eth2, and eth3</p>
<p>40. <input type="checkbox"/></p>	<p>Restart all interfaces</p>	<p>Restart all the ethernet adapters eth0, eth1, eth2, and eth3, one at a time:</p> <pre>[root@DSR-Gen10-ol7 ova]# ifdown &lt;ethernet adapter&gt;</pre> <pre>[root@DSR-Gen10-ol7 ova]# ifup &lt;ethernet adapter&gt;</pre> <p>Verify again by using above Step 40.</p>
<p>41. <input type="checkbox"/></p>	<p>Reboot the host machine</p>	<p>Reboot the host machine:</p> <pre>[root@DSR-Gen10-ol7 ova]# reboot</pre>



STEP #	Procedure	Description
<p>42.</p> <input type="checkbox"/>	<p>Verify below points on host machine</p> <ul style="list-style-type: none"> <li>ring buffer sizes are set to max on all the ether-net devices</li> <li>txqueue length for all the ether-net adapter to a high value</li> </ul>	<p>Verify that the following configurations on host machine persist as per the configuration done above:</p> <ul style="list-style-type: none"> <li>• If you have performed Multiqueue configuration on IPFE using Appendix I.3, verify the configuration as mentioned the appendix.</li> <li>• Ring buffer size setting to max on all the ether-net devices using Step 37.</li> <li>• The txqueue length for all the ether-net adapter to a high value using Step 28.</li> </ul>
<p>43.</p> <input type="checkbox"/>	<p>Create OCDSR VMs. Repeat this step for each VM</p>	<p>Create OCDSR VMs such as NO, SO, MP, IPFE and so on.</p> <p>See <b>Create and Install OCDSR VM via KVM GUI</b>. Repeat this procedure for each VM.</p> <p>As addition completes for each Server, tick mark the associated check box.</p>

STEP #	Procedure	Description
<p>44.</p> <p><input type="checkbox"/></p>	<p>For each DSR VMs:</p> <p>Add the network device</p>	<p>Login to each VM created and add the network devices:</p> <p><b>NO:</b></p> <ul style="list-style-type: none"> <li>• netAdm add -device=eth0</li> <li>• netAdm add -device=eth1</li> </ul> <p><b>SO:</b></p> <ul style="list-style-type: none"> <li>• netAdm add -device=eth0</li> <li>• netAdm add -device=eth1</li> </ul> <p><b>MP:</b></p> <ul style="list-style-type: none"> <li>• netAdm add -device=eth0</li> <li>• netAdm add -device=eth1</li> <li>• netAdm add -device=eth2</li> <li>• netAdm add -device=eth3</li> </ul> <p>For example:</p> <pre>[root@hostnamef3975b010b56 ~]# netAdm add --device=eth0 ERROR: Interface eth0 already exists ERROR: Configuration of eth0 failed [root@hostnamef3975b010b56 ~]# netAdm add --device=eth1 Interface eth1 added [root@hostnamef3975b010b56 ~]# netAdm add --device=eth2 Interface eth2 added [root@hostnamef3975b010b56 ~]# netAdm add --device=eth3 Interface eth3 added</pre> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• eth0 is XMI</li> <li>• eth1 is IMI</li> <li>• eth2 is XSI1</li> <li>• eth3 is XSI2 (create eth3 if XSI2 is required)</li> </ul>

STEP #	Procedure	Description
45. <input type="checkbox"/>	For each DSR VMs:  Configure XMI network address	<p>Set XMI network address for each DSR VM:</p> <pre>netAdm set --device=eth0 --onboot=yes --netmask=&lt;XMI_netmask&gt; --address=&lt;XMI_network_address&gt;</pre> <pre>netAdm add --device=eth0 --route=default --gateway=&lt;XMI_gateway&gt;</pre> <p>For example:</p> <pre>root@hostnamef3975b010b56 ~]# netAdm set --onboot=yes --device=eth0 --netmask=255.255.255.128 --address=10.75.193.195 Interface eth0 updated root@hostnamef3975b010b56 ~]# netAdm add --device=eth0 --route=default --gateway=10.75.193.129 Route to eth0 added root@hostnamef3975b010b56 ~]#</pre>
46. <input type="checkbox"/>	For each DSR VMs:  Configure NTP service	<p>Configure NTP service for each VM. Execute this step on VM.</p> <p>Open the <code>/etc/ntp.conf</code> file and add the NTP servers used in your environment.</p> <p>You can add multiple NTP servers, similar to the examples shown below:</p> <pre># # List of NTP servers and peers # server 10.250.32.10 iburst server ntpserver1 iburst server ntpserver2 iburst server ntpserver3 iburst peer ntppeerA iburst peer ntppeerB iburst</pre> <p>Run the <code>service ntpd start</code> command to start the NTP service and implement the configuration changes:</p> <pre>[admusr@hostnamef37eece35d2c ~]\$ sudo service ntpd restart Shutting down ntpd: [ OK ] Starting ntpd: [ OK ]</pre> <p>Verify ntp status:</p> <pre>[admusr@hostnamef37eece35d2c ~]\$ ntpstat synchronised to NTP server (10.250.32.10) at stratum 4 time correct to within 1877 ms polling server every 64 s</pre>

### 3.5.2 Create and Install OCDSR VMs via KVM GUI

#### Procedure 12. Create and Install OCDSR VMs via KVM GUI

STEP #	Procedure	Description
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This procedure will install DSR VMs NO, SO, and MP using KVM GUI.

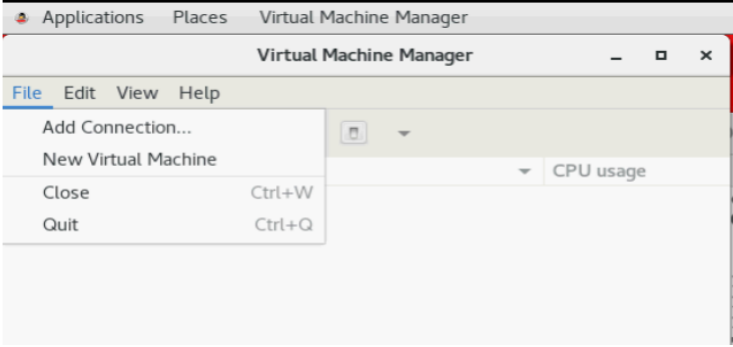
**Note:**

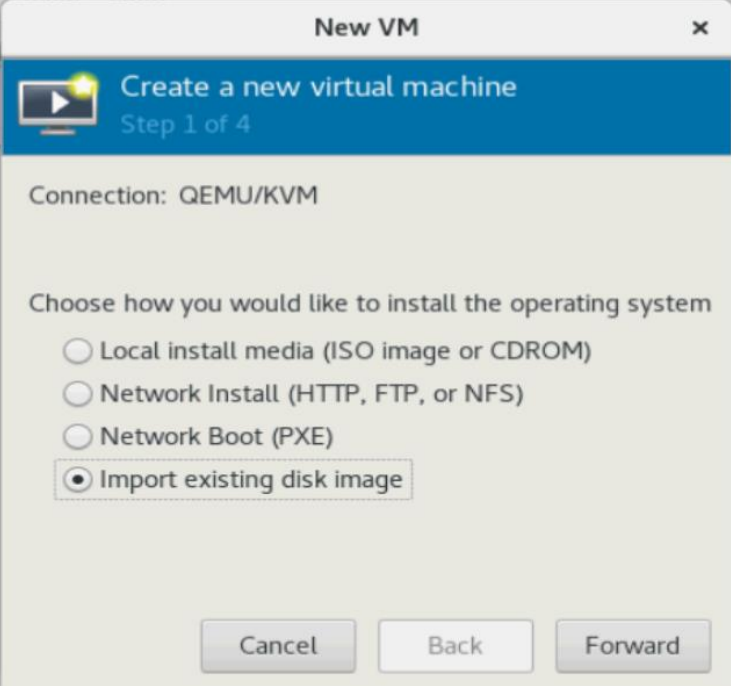
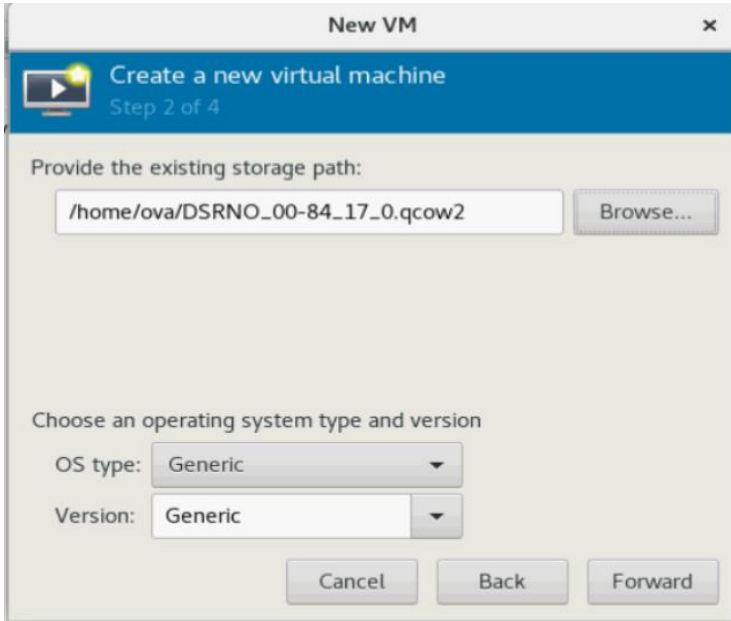
- This installation procedure is only applicable for each VM: NO, SO, MP and so on.

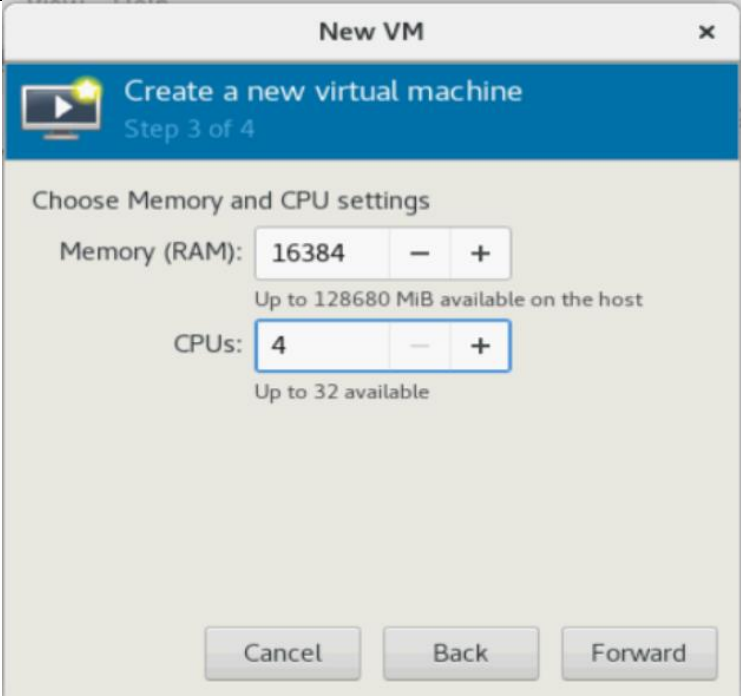
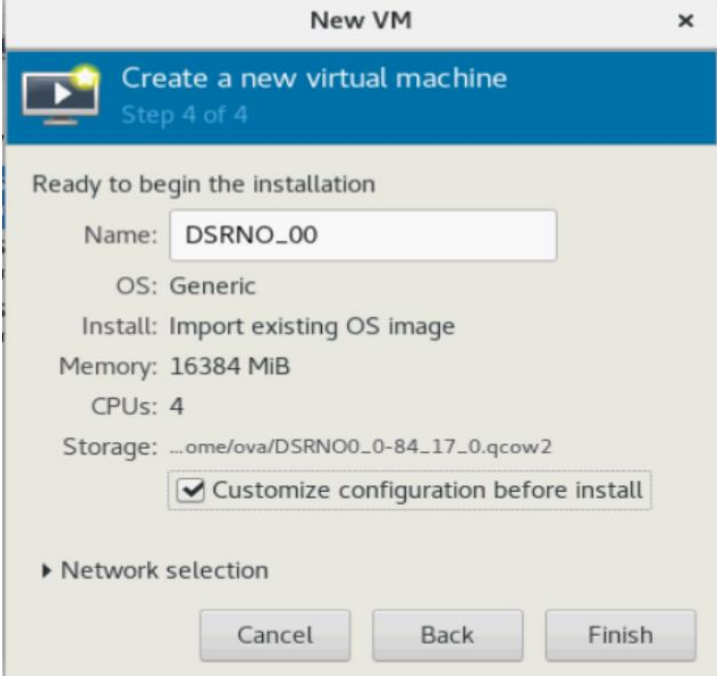
**Prerequisite:** Install DSR on Oracle Linux OS via KVM (Step 1 to 25 must be complete)

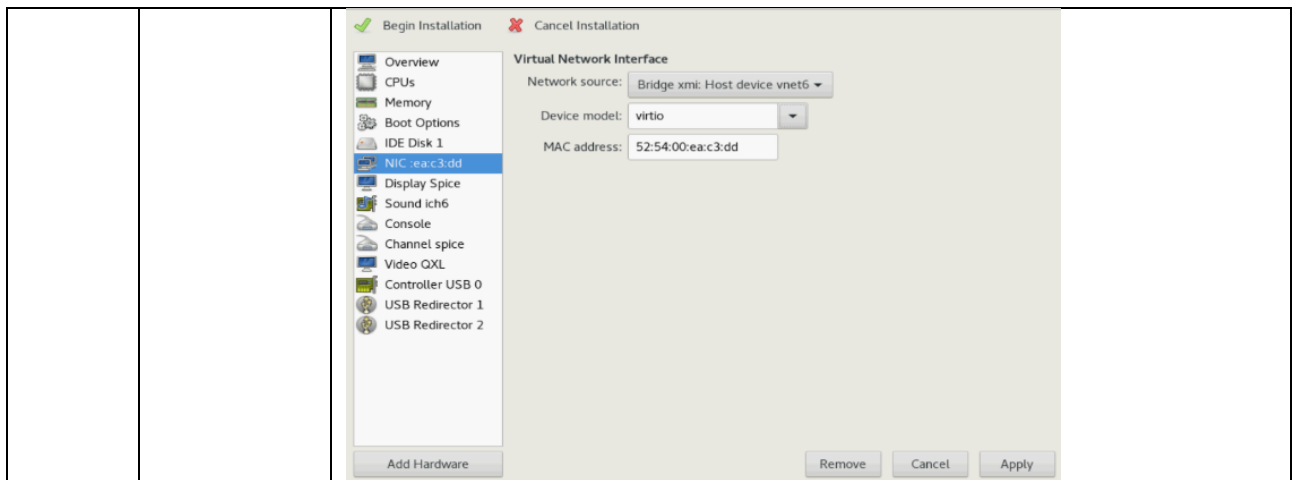
Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.

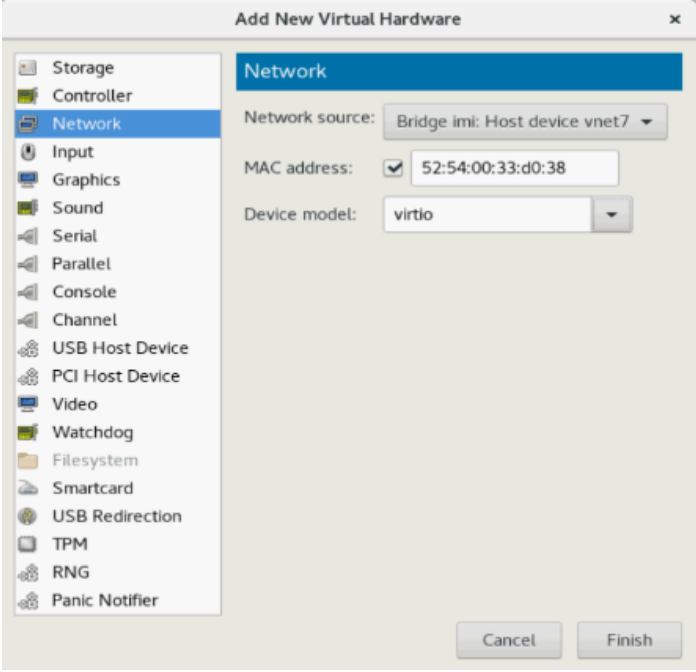
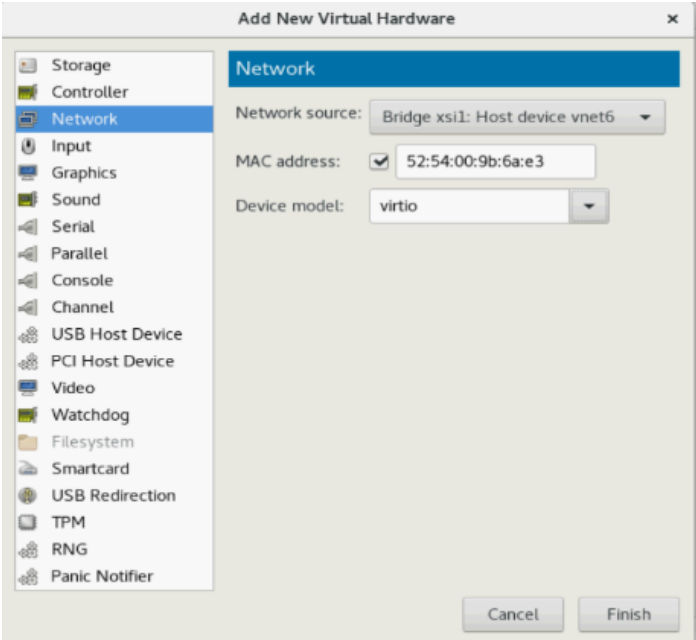
If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.

<p>47. <input type="checkbox"/></p>	<p>Login to the host machine and open the Virtual Machine Manager</p>	<p>Login to the host machine which has Oracle Linux installed and open the Virtual Machine Manager via cli, by executing:</p> <pre>virt-manager</pre> <p><b>Note:</b> Make sure X11 forwarding is enabled before running <code>virt-manager</code> command on CLI.</p> 
<p>48. <input type="checkbox"/></p>	<p>Create a new Virtual Machine using the Virtual Manager GUI</p>	<p>On Virtual Manager GUI,</p> <ol style="list-style-type: none"> <li>3. Click <b>File -&gt; New Virtual Machine</b></li> <li>4. Select <b>Import existing disk image</b></li> </ol>

		
<p>49. <input type="checkbox"/></p>	<p>Select the image file</p>	<p>Select the qcow2 image by browsing the location: /home/ova and Click <b>Forward</b>. See Step 24 and 25 of Install DSR on Oracle Linux/KVM</p> 
<p>50. <input type="checkbox"/></p>	<p>Select RAM and vCPUs for VM</p>	<p>Select RAM and vCPUs for VM. For each VM, select the RAM and vCPUs as per the required resource profile. Refer to VM Resource Profile Flavor section. Click <b>Forward</b>.</p>

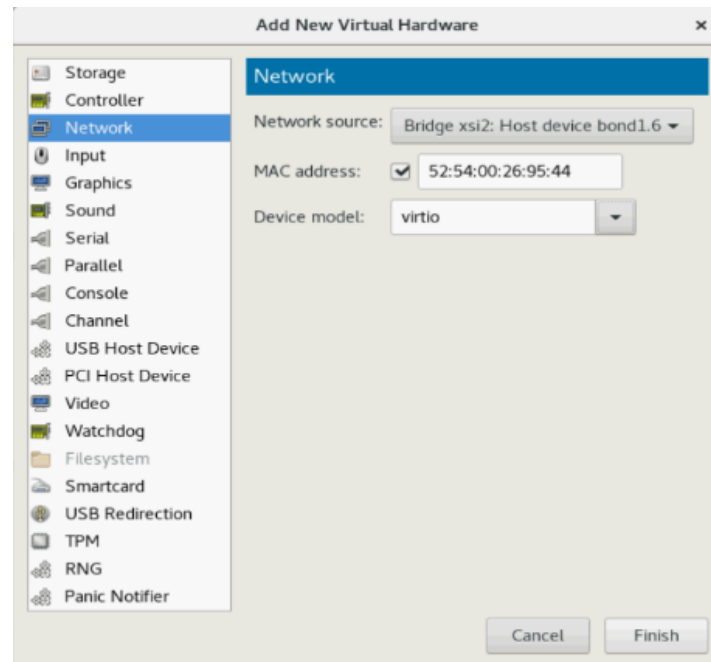
		
<p>51. <input type="checkbox"/></p>	<p>Verify and customize VM</p>	<p>Update the VM name and select <b>Customize configuration before install</b>. Under Network selection, select XMI bridge and click <b>Finish</b>.</p> 
<p>52. <input type="checkbox"/></p>	<p>Modify the Device model to virtio for XMI bridge</p>	<p>For XMI bridge, modify the device model to virtio:</p>



<p>53. <input type="checkbox"/></p>	<p>Customize the network configuration</p>	<p>On the next screen, Click <b>Add Hardware</b>.</p> <ul style="list-style-type: none"> <li>• Under Network source, choose the IMI Bridge.</li> <li>• For NO and SO, choose IMI bridge only.</li> <li>• For MP, add XSI1, along with IMI by repeating this step.</li> <li>• Click <b>Finish</b>.</li> </ul>  <p>Only for MP, we need to add XSI1 &amp; XSI2 bridge as well. For XSI1 bridge:</p> 
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For XSI2 bridge:

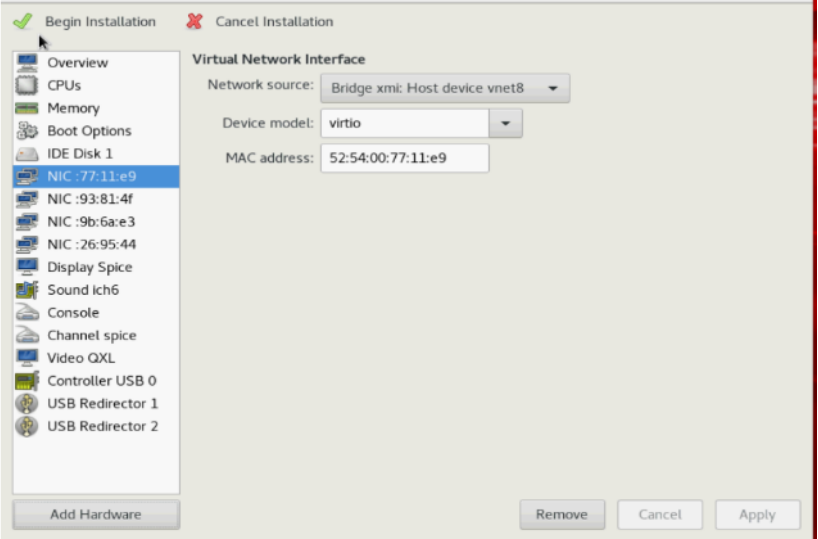


**Note:**

- For DSR Topology it is recommended to add all interfaces on each VM, even when the VM does not require that interface or does not use a VLAN.
- It is just to use a standard when the topology is created from NOAM GUI.

DSR VMs	
XMI	eth0
IMI	eth1
XSI1	eth2
XSI2	eth3

Add all interfaces as needed. After adding the other networks, you will see the NICs appear.

<p>54.</p> <p><input type="checkbox"/></p>	<p>Verify and begin installation</p>	<p>After adding all bridges, verify and begin the VM installation:</p> 
<p>55.</p>	<p>Disable TSO GSO features (Optional)</p>	<p>To disable the TSO GSO features for SBR server, see Appendix I.5.</p>

## 4. Software Installation Using HEAT Templates (OpenStack)

### 4.1 Prepare OpenStack Template and Environment files

#### Procedure 13. Prepare OpenStack Templates and Environment Files for NOAM/Signaling Stacks

STEP #	Procedure	Description
<p>This procedure gathers required templates and environment files to provide while deploying NOAM/signaling stacks.</p> <p><b>Prerequisite:</b> All the respective infrastructures has to be up and running.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
56. <input type="checkbox"/>	Login to Oracle document repository - OTN	Log into the Oracle Document Repository at <a href="http://docs.oracle.com/en/industries/communications/diameter-signaling-router/index.html">http://docs.oracle.com/en/industries/communications/diameter-signaling-router/index.html</a>
57. <input type="checkbox"/>	Select the DSR Release	Select the respective release folder. For example, Release 8.5.0.X.
58. <input type="checkbox"/>	Download HEAT templates	Download the <b>HEAT Templates</b> zip file under <b>Cloud Installation and Upgrade</b> section.
59. <input type="checkbox"/>	Unzip the HEAT templates to a folder	<ol style="list-style-type: none"> <li>1. Create a new folder with any name for storing the HEAT templates under the home directory. Example : /home/heat_templates</li> <li>2. Store the downloaded HEAT templates zip file in the folder. Example : /home/heat_templates/exampleHeat.zip</li> <li>3. Unzip the downloaded heat templates. unzip /home/heat_templates/exampleHeat.zip</li> </ol>

<p>60. <input type="checkbox"/></p>	<p>Determine the template and environment files</p>	<p>Below are possible deployment use cases of DSR. The HEAT templates contain files for all scenarios. Determine the appropriate template and environment files with respect to your requirement.</p> <p><b>Note:</b> Currently, SS7 MPs are not supported. Refer to Appendix J.2 Example Parameter File.</p> <table border="1"> <thead> <tr> <th>Deployment Use Case</th> <th>Template Files</th> <th>Environment Files</th> </tr> </thead> <tbody> <tr> <td>Dynamic IP - With VIP</td> <td> <b>NOAM Template</b>                      dsrNetworkOam_provider.yaml  <b>Signaling Template</b>                      dsrSignalingNode_provider.yaml                 </td> <td>dsrResources_provider.yaml</td> </tr> <tr> <td>Dynamic IP - Without VIP</td> <td> <b>NOAM Template</b>                      dsrNetworkOamNoVip_provider.yaml  <b>Signaling Template</b>                      dsrSignalingNodeNoVip_provider.yaml                 </td> <td>dsrResourcesNoVip_provider.yaml</td> </tr> <tr> <td>Fixed IP - With VIP</td> <td> <b>NOAM Template</b>                      dsrNetworkOam_fixedIps.yaml  <b>Signaling Template</b>                      dsrSignalingNode_fixedIps.yaml                 </td> <td>dsrResources_fixedIps.yaml</td> </tr> <tr> <td>Fixed IP - Without VIP</td> <td> <b>NOAM Template</b>                      Yet to be created  <b>Signaling Template</b>                      Yet to be created.                 </td> <td>Yet to be created</td> </tr> <tr> <td>Dynamic IP - With IDIH nodes</td> <td> <b>NOAM Template</b>                      dsrNetworkOam_provider.yaml  <b>Signaling Template</b>                      dsrSignalingNodeI dih_provider.yaml                 </td> <td>idihResources_provider.yaml</td> </tr> <tr> <td>Fixed IP - With IDIH nodes</td> <td> <b>NOAM Template</b>                      dsrNetworkOam_fixedIps.yaml  <b>Signaling Template</b>                      dsrSignalingNodeI dih_fixedIps.yaml                 </td> <td>dsrResourcesI dih_fixedIps.yaml</td> </tr> </tbody> </table>	Deployment Use Case	Template Files	Environment Files	Dynamic IP - With VIP	<b>NOAM Template</b> dsrNetworkOam_provider.yaml <b>Signaling Template</b> dsrSignalingNode_provider.yaml	dsrResources_provider.yaml	Dynamic IP - Without VIP	<b>NOAM Template</b> dsrNetworkOamNoVip_provider.yaml <b>Signaling Template</b> dsrSignalingNodeNoVip_provider.yaml	dsrResourcesNoVip_provider.yaml	Fixed IP - With VIP	<b>NOAM Template</b> dsrNetworkOam_fixedIps.yaml <b>Signaling Template</b> dsrSignalingNode_fixedIps.yaml	dsrResources_fixedIps.yaml	Fixed IP - Without VIP	<b>NOAM Template</b> Yet to be created <b>Signaling Template</b> Yet to be created.	Yet to be created	Dynamic IP - With IDIH nodes	<b>NOAM Template</b> dsrNetworkOam_provider.yaml <b>Signaling Template</b> dsrSignalingNodeI dih_provider.yaml	idihResources_provider.yaml	Fixed IP - With IDIH nodes	<b>NOAM Template</b> dsrNetworkOam_fixedIps.yaml <b>Signaling Template</b> dsrSignalingNodeI dih_fixedIps.yaml	dsrResourcesI dih_fixedIps.yaml
Deployment Use Case	Template Files	Environment Files																					
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## 4.2 Create OpenStack Parameters files

### Procedure 14. Create OpenStack Parameter File for NOAM

STEP #	Procedure	Description
		<p>This procedure instructs how to manually create input parameters file to be provided while deploying NOAM stacks.</p> <p><b>Prerequisite:</b> All the respective infrastructures has to be up and running</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
1. □	Login to OpenStack server CLI	Log into the OpenStack server through command line.
2. □	Create the parameter file	<ol style="list-style-type: none"> <li>Go to the folder created in Procedure 13, step 59. for storing the templates.</li> <li>Create an empty NOAM parameter file in this folder following this naming convention to identify the purpose of the file.             &lt;DSR Name&gt;_&lt;Site Name&gt;_NetworkOam_Params.yaml            For example:            dsrCloudInit_Site00_NetworkOam_Params.yaml</li> </ol>
3. □	Sample file	<p>Refer to Appendix J.1 Example Template File for a sample file with values.</p> <p><b>Note:</b> It is important to keep the example file ready since this helps you understand the use of each key value pair described in the next step while creating the parameter file.</p>
4. □	Populate the parameters file	<p>Refer to Appendix J.1 Example Template File to create the parameter file in YAML format.</p> <p><b>Note:</b> Follow these guidelines while working with the YAML files.</p> <ul style="list-style-type: none"> <li>The file must end with .yaml extension.</li> <li>YAML must be case-sensitive and indentation-sensitive.</li> <li>YAML does not support the use of tabs. Instead of tabs, it uses spaces.</li> <li>This file is in YAML format and it contains <b>key:value</b> pairs.</li> <li>The first key should be <b>parameters:</b> and then the remaining required key/value pairs for the topology.</li> </ul> <p>This table lists all required key:value pairs.</p>

Key Name	Type	Description
numPrimaryNoams	number	The number of NOAMs that receive and load DSR topology information. <b>Note:</b> In DSR 8.5, use 1 as valid value. This NOAM represents active NOAM.
numNoams	number	The number of NOAMs in the DSR topology other than primary NOAM. <b>Note:</b> In DSR 8.5, use 1 as valid value. This NOAM represents standby NOAM.
noamImage	string	The VM image for the NOAM. <b>Note:</b> This image is used for both active and standby NOAMs.
noamFlavor	string	The flavor that defines the VM size for the NOAM. <b>Note:</b> This flavor is used for both active and standby NOAMs.
primaryNoamVmNames	comma_delimited_list	List of Primary NOAM VM names <b>Note:</b> Number of VMnames must be equal to the numPrimaryNoams value.
noamVmNames	comma_delimited_list	List of NOAM VM names other than primary NOAM VMs. <b>Note:</b> Number of VMnames must be equal to the numNoams value.
noamAZ	string	The availability zone into which NOAM servers should be placed. <b>Note:</b> In DSR 8.5, all NOAM servers are placed in the same availability zone.
noamSG	string	The server group where NOAMs at this site belong.
xmiPublicNetwork	string	External management interface.

STEP #	Procedure	Description																								
		<table border="1"> <tr> <td>imiPrivateNetwork</td> <td>string</td> <td>Internal management interface.</td> </tr> <tr> <td>imiPrivateSubnet</td> <td>string</td> <td>Name of the IMI network.</td> </tr> <tr> <td>imiPrivateSubnetCidr</td> <td>string</td> <td>The address range for the subnet.</td> </tr> <tr> <td>ntpServer</td> <td>string</td> <td>IP of the NTP server.</td> </tr> <tr> <td colspan="3"><b>Note:</b> The below 3 keys are ONLY applicable for fixed IP scenario.</td> </tr> <tr> <td>primaryNoamXmilps</td> <td>comma_delimited_list</td> <td>Previously reserved IP for the primary NOAM to talk to external devices.</td> </tr> <tr> <td>noamXmilps</td> <td>comma_delimited_list</td> <td>Previously reserved IP for non-primary NOAMs to talk to external devices.</td> </tr> <tr> <td>noamVip</td> <td>string</td> <td>VIP for NOAMs.</td> </tr> </table>	imiPrivateNetwork	string	Internal management interface.	imiPrivateSubnet	string	Name of the IMI network.	imiPrivateSubnetCidr	string	The address range for the subnet.	ntpServer	string	IP of the NTP server.	<b>Note:</b> The below 3 keys are ONLY applicable for fixed IP scenario.			primaryNoamXmilps	comma_delimited_list	Previously reserved IP for the primary NOAM to talk to external devices.	noamXmilps	comma_delimited_list	Previously reserved IP for non-primary NOAMs to talk to external devices.	noamVip	string	VIP for NOAMs.
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ntpServer	string	IP of the NTP server.																								
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primaryNoamXmilps	comma_delimited_list	Previously reserved IP for the primary NOAM to talk to external devices.																								
noamXmilps	comma_delimited_list	Previously reserved IP for non-primary NOAMs to talk to external devices.																								
noamVip	string	VIP for NOAMs.																								

**Procedure 15. Create OpenStack Parameter File for Signaling**

STEP #	Procedure	Description
<p>This procedure manually creates the input parameters file to provide while deploying signaling stacks.</p> <p><b>Prerequisite:</b> All the respective infrastructures has to be up and running.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	Log into the OpenStack server CLI	Log into the OpenStack CLI.
2. <input type="checkbox"/>	Create the parameter file	<p>1. Go to the folder created in Procedure 13, step 59. for storing the templates.</p> <p>2. Create an empty signaling parameter file in this folder following this naming convention to identify the purpose of the file.</p> <p>&lt;DSR Name&gt;_&lt;Site Name&gt;_SignalingNode_Params.yaml</p> <p>For example:</p> <p>dsrCloudInit_Site00_SignalingNode_Params.yaml</p>
3. <input type="checkbox"/>	Sample file	<p>Refer to Appendix J.1 Example Template File for a sample file with values.</p> <p><b>Note:</b> It is important to keep the example file ready since this helps you understand the use of each key value pair described in the next step while creating the parameter file.</p>
4. <input type="checkbox"/>	Populate the parameters file	<p>Refer to Appendix J.1 Example Template File to create the parameter file in YAML format.</p> <p><b>Note:</b> Follow these guidelines while working with the YAML files.</p> <ul style="list-style-type: none"> <li>• The file must end with .yaml extension.</li> <li>• YAML must be case-sensitive and indentation-sensitive.</li> <li>• YAML does not support the use of tabs. Instead of tabs, it uses spaces.</li> </ul>

- This file is in YAML format and it contains **key:value** pairs.
- The first key should be **parameters:** and then the remaining required key/value pairs for the topology.

This table lists all required key:value pairs.

Key Name	Type	Description
numSoams	number	The number of SOAMs at this signaling node.
soamImage	string	The VM image for an SOAM.
soamFlavor	string	The flavor that defines the VM size for an SOAM.
soamVmNames	comma_delimited_list	List of SOAM VM names.
soamAZ	string	The availability zone into which SOAM servers should be placed <b>Note:</b> In DSR 8.5, all SOAM servers are placed in the same availability zone
soamSG	string	Server group for the SOAM VMs.
numDas	number	The number of DAs at this signaling node.
daImage	string	The VM image for a DA.
daFlavor	string	The flavor that defines the VM size for a DA.
daVmNames	comma_delimited_list	List of DA VM names.
daAZ	string	The availability zone into which DA servers should be placed. <b>Note:</b> In DSR 8.5, all DA-MP servers are placed in the same availability zone.
daSG	string	Server group for the DA VMs.
daProfileName	string	The MP profile to be applied to all DAs. Possible values are: VM_Relay, VM_Database, VM_6K_Mps, VM_8K_Mps, VM_10K_Mps, VM_12K_Mps, VM_14K_Mps, VM_16K_Mps, VM_18K_Mps, VM_21K_Mps, VM_24K_Mps, VM_27K_Mps, VM_30K_Mps
numIpfes	number	The number of IPFEs at this signaling node.
ipfelImage	string	The VM image for an IPFE.



		ipfeFlavor	string	The flavor that defines the VM size for an IPFE.
		ipfeVmNames	comma_delimited_list	List of IPFE VM names.
		ipfeAZ	string	The availability zone into which IPFE servers should be placed. <b>Note:</b> In DSR 8.5, all IPFE servers are placed in the same availability zone.
		ipfeSGs	comma_delimited_list	Server group for each IPFE VM.
		numStps	number	The number of STPs at this signaling node.
		stpImage	string	The VM image for an STP.
		stpFlavor	string	The flavor that defines the VM size for an STP.
		stpVmNames	comma_delimited_list	List of STP VM names.
		stpAZ	string	The availability zone into which STP servers should be placed. <b>Note:</b> In DSR 8.5, all STP servers are placed in the same availability zone.
		stpSG	string	Server group for the STP VMs.
		xmiPublicNetwork	string	External management interface.
		imiPrivateNetwork	string	Internal management interface.
		imiPrivateSubnet	string	Name of the IMI network.
		imiPrivateSubnetCidr	string	The address range for the subnet.
		xsiPublicNetwork	string	External signaling interface.
		primaryNoamVmName	string	Name of NOAM VM that the config XML was loaded onto <b>Note:</b> NOT used in 8.5. In DSR 8.5, user should NOT provide any value to this key.
		noamXmilps	comma_delimited_list	The XMI IPs for all NOAM servers, excluding VIPs. <b>Note:</b> NOT used in 8.5. In DSR 8.5, user should NOT provide any value to this key.

		ntpServer	string	IP of the NTP server.
		<b>Note:</b> The below keys are ONLY applicable for fixed IP scenario, with or without IDIH nodes		
		soamXmilps	comma_delimited_list	Previously reserved IP for non-primary SOAMs to talk to external devices.
		soamVip	string	VIP for SOAMs.
		daXmilps	comma_delimited_list	Previously reserved IP for DA MP to talk to external devices.
		daXsilps	comma_delimited_list	Previously reserved IP for DA MP to talk to signaling devices.
		ipfeXmilps	comma_delimited_list	Previously reserved IP for IPFE to talk to external devices.
		ipfeXsilps	comma_delimited_list	Previously reserved IP for IPFE to talk to signaling devices.
		stpXmilps	comma_delimited_list	Previously reserved IP for STP to talk to external devices.
		stpXsilps	comma_delimited_list	Previously reserved IP for STP to talk to signaling devices.
		ipfeXsiPublicIp	string	Reserved single IP address on signaling network to which remote diameter hosts route packets for load balancing over set of message processors.
		stpSctpPorts	comma_delimited_list	<p>The SCTP ports to be associated with STP.</p> <p><b>Note:</b> If there is no STP in topology then provide empty list, for example, []</p> <p><b>Note:</b> Open these ports beforehand on which STP connections are going to be created while doing configuration.</p>
		<p>These two parameters are applicable for TCP/SCTP to use with the Diameter connection.</p> <p><b>Note:</b> Open these ports beforehand on which Diameter connections are going to be created while doing Diameter configuration.</p>		
		diameterTcpPorts	comma_delimited_list	The TCP ports to be associated with. If this parameter is not provided, then default ports are assigned.

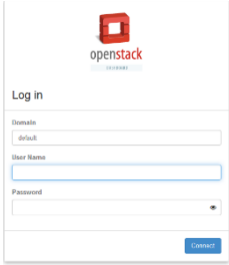
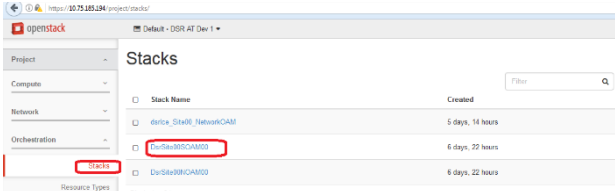
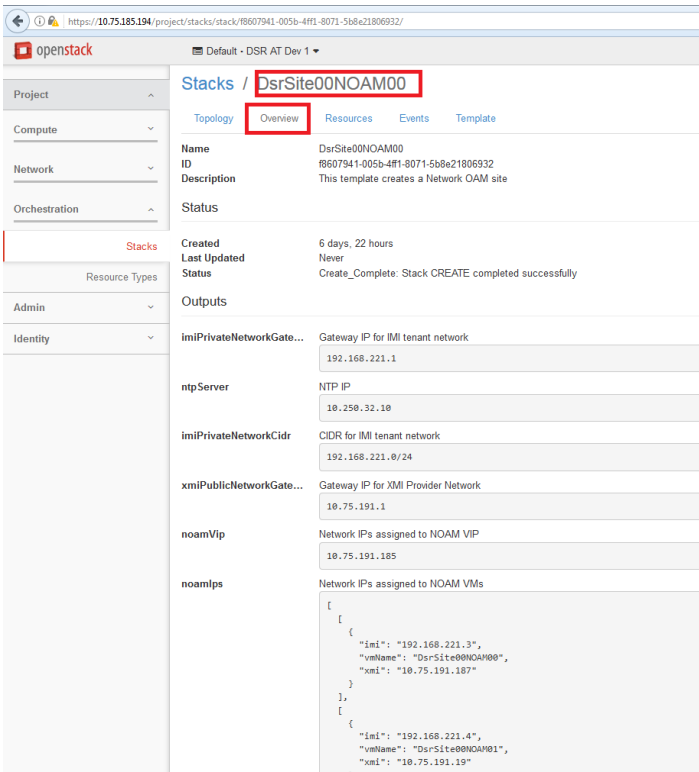
		diameterSctpPorts	comma_delimited_list	The SCTP ports to be associated with. If this parameter is not provided, then default ports are assigned.																		
The below keys are applicable only for scenarios which include IDIH nodes.																						
		idihAppImage	string	The VM image for the IDIH Application VM																		
		idihAppFlavor	string	The flavor that defines the size for the IDIH Application VM																		
		idihAppVmName	string	The IDIH Mediation VM name.																		
		idihMedImage	string	The flavor that defines the size for the IDIH Mediation VM																		
		idihMedVmName	string	The IDIH Mediation VM name																		
		idihDbImage	string	The VM image for the IDIH Database VM																		
		idihDbFlavor	string	The flavor that defines the size for the IDIH Database VM																		
		idihDbVmName	string	The IDIH Database VM name																		
		idihAZ	string	The availability zone into which IDIH VMs should be placed																		
		idihIntPrivateNetwork	string	Name of the internal tenant network (that will be created) for communication between IDIH VMs																		
		idihIntPrivateSubnet	string	Name of the subnet (that will be created) on the IDIH internal tenant network (idihIntPrivateNetwork)																		
<p><b>Note:</b> At least one is mandatory (either TCP/SCTP parameter). Refer to this table to determine the valid combinations for SCTP/TCP port configurations.</p> <table border="1"> <thead> <tr> <th>diameterTcpPorts</th> <th>diameterSctpPorts</th> <th>Is Valid?</th> </tr> </thead> <tbody> <tr> <td>[]</td> <td>[]</td> <td>NO</td> </tr> <tr> <td>[ "" ]</td> <td>[ "" ]</td> <td>NO</td> </tr> <tr> <td>[ "&lt;port(s)&gt;" ]</td> <td>[]</td> <td>YES</td> </tr> <tr> <td>[]</td> <td>[ "&lt;port(s)&gt;" ]</td> <td>YES</td> </tr> <tr> <td>[ "&lt;port(s)&gt;" ]</td> <td>[ "&lt;port(s)&gt;" ]</td> <td>YES</td> </tr> </tbody> </table>					diameterTcpPorts	diameterSctpPorts	Is Valid?	[]	[]	NO	[ "" ]	[ "" ]	NO	[ "<port(s)>" ]	[]	YES	[]	[ "<port(s)>" ]	YES	[ "<port(s)>" ]	[ "<port(s)>" ]	YES
diameterTcpPorts	diameterSctpPorts	Is Valid?																				
[]	[]	NO																				
[ "" ]	[ "" ]	NO																				
[ "<port(s)>" ]	[]	YES																				
[]	[ "<port(s)>" ]	YES																				
[ "<port(s)>" ]	[ "<port(s)>" ]	YES																				
<p><b>Note:</b> Repeat steps 2 and 3 of this procedure for each additional site.</p>																						

### 4.3 Deploy HEAT Templates

#### Procedure 16. Deploy HEAT Templates

STEP #	Procedure	Description
<p>This procedure instructs how to deploy HEAT templates to create NOAM and Signaling stacks.</p> <p><b>Prerequisite:</b> All the respective infrastructures has to be up and running. The required input files are all available.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <input type="checkbox"/>	<p>Login to OpenStack server CLI</p>	<p>Log into the OpenStack CLI.</p>
<p>2.</p> <input type="checkbox"/>	<p>Prepare the input files required for the deployment</p>	<p>To create NOAM and signaling stacks, provide these input files as parameters while deploying the HEAT templates.</p> <p><b>Template Files</b> With respect to the deployment scenario decided in Procedure 13, step 57. the template files for NOAM and signaling stacks have been already determined.</p> <p><b>Environment Files</b> With respect to the deployment scenario decided in Procedure 13, step 57. the environment files for NOAM and signaling stacks have been already determined.</p> <p><b>Parameter Files</b> The parameter file for NOAM has already been created in Procedure 14. The parameter file for signaling has already been created in Procedure 15.</p>
<p>3.</p> <input type="checkbox"/>	<p>Deploy NOAM stack</p>	<p>Execute the OpenStack command to create NOAM stack using the three input files. Make sure the template and environment files are selected with respect to NOAM stack as per in Procedure 13, step 57.</p> <pre>openstack stack create -e &lt;EnvironmentFileForNOAM.yaml&gt; -e &lt;ParameterFileForNOAM.yaml&gt; -t &lt;TemplateFileForNOAM&gt; &lt;NOAMStackName&gt;</pre> <p><b>Example for VIP scenario:</b></p> <pre>\$ openstack stack create -e dsrResources_provider.yaml -e SinglesiteProvider_Site00_NetworkOam_Params.yaml -t dsrNetworkOam_provider.yaml SinglesiteProvider_Site00_NetworkOam</pre>
<p>4.</p> <input type="checkbox"/>	<p>Deploy signaling stack</p>	<p>Execute the OpenStack command to create signaling stack using the three input files. Make sure the template and environment files are selected with respect to signaling stack as per in Procedure 13, step 57.</p> <pre>openstack stack create -e &lt;EnvironmentFileForSignaling.yaml&gt; -e &lt;ParameterFileForSignaling.yaml&gt; -t &lt;TemplateFileForSignaling&gt; &lt;SignalingStackName&gt;</pre> <p><b>Example for VIP scenario:</b></p> <pre>\$ openstack stack create -e dsrResources_provider.yaml -e SinglesiteProvider_Site00_SignalingNode_Params.yaml -t dsrSignalingNode_provider.yaml SinglesiteProvider_Site00_Signaling</pre>


STEP #	Procedure	Description														
5. <input type="checkbox"/>	Verify the stack creation status	<p>1. Execute this command to see the stack creation status.</p> <pre>\$ openstack stack show &lt;stackname&gt;</pre> <table border="1"> <thead> <tr> <th>ID</th> <th>Name</th> <th>Status</th> <th>Created</th> </tr> </thead> <tbody> <tr> <td>(uuid)</td> <td>teststack</td> <td>CREATE_IN_PROGRESS</td> <td>(timestamp)</td> </tr> </tbody> </table> <p>It takes about 2 minutes to complete the creation.</p> <p>2. Execute the command again to verify the status.</p> <pre>\$ openstack stack show &lt;stackname&gt;</pre> <table border="1"> <thead> <tr> <th>ID</th> <th>Stack Name</th> <th>Stack Status</th> </tr> </thead> <tbody> <tr> <td>950ed51a-cca7-478a-81e4-3d61562c045d</td> <td>teststack</td> <td>CREATE_COMPLETE</td> </tr> </tbody> </table>	ID	Name	Status	Created	(uuid)	teststack	CREATE_IN_PROGRESS	(timestamp)	ID	Stack Name	Stack Status	950ed51a-cca7-478a-81e4-3d61562c045d	teststack	CREATE_COMPLETE
ID	Name	Status	Created													
(uuid)	teststack	CREATE_IN_PROGRESS	(timestamp)													
ID	Stack Name	Stack Status														
950ed51a-cca7-478a-81e4-3d61562c045d	teststack	CREATE_COMPLETE														

STEP #	Procedure	Description
<p>6.</p> <p><input type="checkbox"/></p>	<p>Retrieve required IPs from created stacks</p>	<ol style="list-style-type: none"> <li>Log into the OpenStack GUI with valid credentials.</li> </ol>  <ol style="list-style-type: none"> <li>Navigate to <b>Project &gt; Orchestration</b> and click <b>Stacks</b>.</li> </ol>  <ol style="list-style-type: none"> <li>Select the stack you created (&lt;stackname&gt;) and click <b>Overview</b> to see the IP details of the stack.</li> </ol>  <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>All NOAM IP information displays in the NOAM stack (&lt;NOAMStackName&gt;).</li> <li>All signaling IP information displays in the signaling stack (&lt;SignalingStackName&gt;).</li> </ul> <ol style="list-style-type: none"> <li>Retrieve the IP details for DSR configuration.</li> </ol>

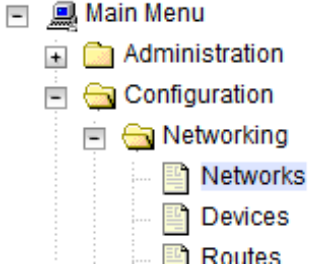


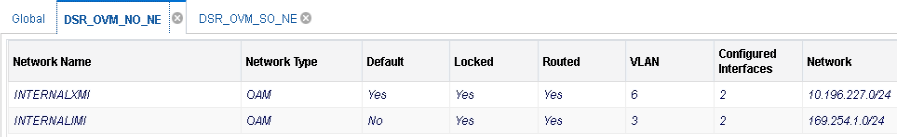
## 5. Application Configuration

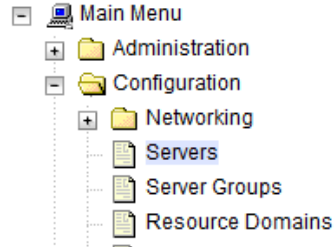
### Procedure 17. Configure the First NOAM NE and Server

STEP #	Procedure	Description
<p>This procedure configures the first NOAM VM.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <p><input type="checkbox"/></p>	<p><b>Resolve the Hostname:</b> Get the HTTPD running</p>	<p>Change Hostname from the default value using sudo:</p> <ol style="list-style-type: none"> <li>1. Edit /etc/hosts file                             <p><b>Note:</b> Remove any occurrence of "." and the "&lt;availability zone&gt;" name, such as ".novalocal" from the hostname that might have got appended.</p> <ol style="list-style-type: none"> <li>a) Append the hostname to the IPv4 line as,                                     <pre>"127.0.0.1 localhost localhost4 NOAM1"</pre> </li> <li>b) Append the hostname to the IPv6 line as,                                     <pre>"::1 localhost localhost6 NOAM1"</pre> </li> </ol> </li> <li>2. Edit /etc/syconfig/network.                             <ol style="list-style-type: none"> <li>a) Change the "HOSTNAME=XXXX" line to the new hostname.                                     <pre>"HOSTNAME=NOAM1"</pre> </li> <li>b) Set the hostname on the command line:                                     <pre>\$ sudo hostname NOAM1</pre> </li> </ol> </li> <li>3. Reboot the VM                             <pre>\$ sudo init 6</pre> </li> </ol>

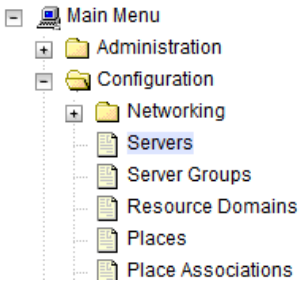
STEP #	Procedure	Description
<p>2. <input type="checkbox"/></p>	<p><b>NOAM GUI: Login</b></p>	<p>Establish a GUI session as the <b>guiadmin</b> user on the NOAM server by using the XMI IP address.</p> 



STEP #	Procedure	Description																								
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Create the NOAM network element using the XML file</p>	<p>1. Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.</p>  <p>2. Click <b>Browse</b> and type the pathname of the NOAM network XML file.</p>  <p>3. Click <b>Upload File</b> to upload the XML file. See the examples in Appendix Sample Network Element and Hardware Profiles and configure the NOAM network element.</p> <p>To create a new Network Element, upload a valid configuration file:</p>  <p>4. Once the data has been uploaded, you should see a tabs display with the name of your network element. Click on this tab which describes the individual networks that are now configured.</p>  <table border="1"> <thead> <tr> <th>Network Name</th> <th>Network Type</th> <th>Default</th> <th>Locked</th> <th>Routed</th> <th>VLAN</th> <th>Configured Interfaces</th> <th>Network</th> </tr> </thead> <tbody> <tr> <td>INTERNALXMI</td> <td>OAM</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>6</td> <td>2</td> <td>10.196.227.0/24</td> </tr> <tr> <td>INTERNALMI</td> <td>OAM</td> <td>No</td> <td>Yes</td> <td>Yes</td> <td>3</td> <td>2</td> <td>169.254.1.0/24</td> </tr> </tbody> </table>	Network Name	Network Type	Default	Locked	Routed	VLAN	Configured Interfaces	Network	INTERNALXMI	OAM	Yes	Yes	Yes	6	2	10.196.227.0/24	INTERNALMI	OAM	No	Yes	Yes	3	2	169.254.1.0/24
Network Name	Network Type	Default	Locked	Routed	VLAN	Configured Interfaces	Network																			
INTERNALXMI	OAM	Yes	Yes	Yes	6	2	10.196.227.0/24																			
INTERNALMI	OAM	No	Yes	Yes	3	2	169.254.1.0/24																			

STEP #	Procedure	Description																																																
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Map services to networks</p>	<p>1. Navigate to <b>Configuration &gt; Networking &gt; Services</b>.</p> <p>2. Click <b>Edit</b> and set the services as shown in the table below:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Intra-NE Network</th> <th>Inter-NE Network</th> </tr> </thead> <tbody> <tr> <td>OAM</td> <td>&lt;IMI Network&gt;</td> <td>&lt;XMI Network&gt;</td> </tr> <tr> <td>Replication</td> <td>&lt;IMI Network&gt;</td> <td>&lt;XMI Network&gt;</td> </tr> <tr> <td>Signaling</td> <td>Unspecified</td> <td>Unspecified</td> </tr> <tr> <td>HA_Secondary</td> <td>Unspecified</td> <td>Unspecified</td> </tr> <tr> <td>HA_MP_Secondary</td> <td>Unspecified</td> <td>Unspecified</td> </tr> <tr> <td>Replication_MP</td> <td>&lt;IMI Network&gt;</td> <td>Unspecified</td> </tr> <tr> <td>ComAgent</td> <td>&lt;IMI Network&gt;</td> <td>Unspecified</td> </tr> </tbody> </table> <p>For example, if your IMI network is named <b>IMI</b> and your XMI network is named <b>XMI</b>, then your services configuration should look like the following:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Intra-NE Network</th> <th>Inter-NE Network</th> </tr> </thead> <tbody> <tr> <td>OAM</td> <td>INTERNALIMI</td> <td>INTERNALXMI</td> </tr> <tr> <td>Replication</td> <td>INTERNALIMI</td> <td>INTERNALXMI</td> </tr> <tr> <td>Signaling</td> <td>Unspecified</td> <td>Unspecified</td> </tr> <tr> <td>HA_Secondary</td> <td>Unspecified</td> <td>Unspecified</td> </tr> <tr> <td>HA_MP_Secondary</td> <td>Unspecified</td> <td>Unspecified</td> </tr> <tr> <td>Replication_MP</td> <td>INTERNALIMI</td> <td>Unspecified</td> </tr> <tr> <td>ComAgent</td> <td>INTERNALIMI</td> <td>Unspecified</td> </tr> </tbody> </table> <p>3. Click <b>OK</b> to apply the Service-to-Network selections. Dismiss any possible popup notifications.</p>	Name	Intra-NE Network	Inter-NE Network	OAM	<IMI Network>	<XMI Network>	Replication	<IMI Network>	<XMI Network>	Signaling	Unspecified	Unspecified	HA_Secondary	Unspecified	Unspecified	HA_MP_Secondary	Unspecified	Unspecified	Replication_MP	<IMI Network>	Unspecified	ComAgent	<IMI Network>	Unspecified	Name	Intra-NE Network	Inter-NE Network	OAM	INTERNALIMI	INTERNALXMI	Replication	INTERNALIMI	INTERNALXMI	Signaling	Unspecified	Unspecified	HA_Secondary	Unspecified	Unspecified	HA_MP_Secondary	Unspecified	Unspecified	Replication_MP	INTERNALIMI	Unspecified	ComAgent	INTERNALIMI	Unspecified
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ComAgent	INTERNALIMI	Unspecified																																																
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Insert the 1st NOAM VM</p>	<p>1. Navigate to <b>Configuration &gt; Servers</b>.</p> 																																																

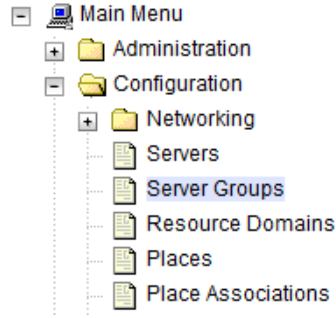
STEP #	Procedure	Description																																		
		<p>2. Click <b>Insert</b> to insert the new NOAM server into servers table (the first or server).</p> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Hostname *</td> <td><input type="text"/></td> </tr> <tr> <td>Role *</td> <td>- Select Role - <input type="button" value="v"/></td> </tr> <tr> <td>System ID</td> <td><input type="text"/></td> </tr> <tr> <td>Hardware Profile</td> <td>DSR Guest <input type="button" value="v"/></td> </tr> <tr> <td>Network Element Name *</td> <td>- Unassigned - <input type="button" value="v"/></td> </tr> <tr> <td>Location</td> <td><input type="text"/></td> </tr> </tbody> </table> <p>3. Fill in the fields as follows:</p> <p><b>Hostname:</b> &lt;Hostname&gt;  <b>Role:</b> NETWORK OAM&amp;P  <b>System ID:</b> &lt;Site System ID&gt;  <b>Hardware Profile:</b> DSR Guest  <b>Network Element Name:</b> [Select NE from drop-down list]</p> <p>The network interface fields are now available with selection choices based on the chosen hardware profile and network element.</p> <table border="1"> <thead> <tr> <th colspan="3">OAM Interfaces [At least one interface is required.]:</th> </tr> <tr> <th>Network</th> <th>IP Address</th> <th>Interface</th> </tr> </thead> <tbody> <tr> <td>INTERNALXMI (10.196.227.0/24)</td> <td>10.196.227.21</td> <td>eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (6)</td> </tr> <tr> <td>INTERNALIMI (169.254.1.0/24)</td> <td>169.254.1.21</td> <td>eth1 <input type="button" value="v"/> <input type="checkbox"/> VLAN (3)</td> </tr> </tbody> </table> <p><input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/></p> <p>4. Fill in the server IP addresses for the XMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unchecked.</p> <p>5. Fill in the server IP addresses for the IMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unchecked.</p> <p>6. Add the following NTP servers:</p> <table border="1"> <thead> <tr> <th>NTP Server</th> <th>Preferred?</th> </tr> </thead> <tbody> <tr> <td>Valid NTP Server</td> <td>Yes</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> </tbody> </table> <p>7. Click <b>OK</b> when you have completed entering all the server data.</p>	Attribute	Value	Hostname *	<input type="text"/>	Role *	- Select Role - <input type="button" value="v"/>	System ID	<input type="text"/>	Hardware Profile	DSR Guest <input type="button" value="v"/>	Network Element Name *	- Unassigned - <input type="button" value="v"/>	Location	<input type="text"/>	OAM Interfaces [At least one interface is required.]:			Network	IP Address	Interface	INTERNALXMI (10.196.227.0/24)	10.196.227.21	eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (6)	INTERNALIMI (169.254.1.0/24)	169.254.1.21	eth1 <input type="button" value="v"/> <input type="checkbox"/> VLAN (3)	NTP Server	Preferred?	Valid NTP Server	Yes	Valid NTP Server	No	Valid NTP Server	No
Attribute	Value																																			
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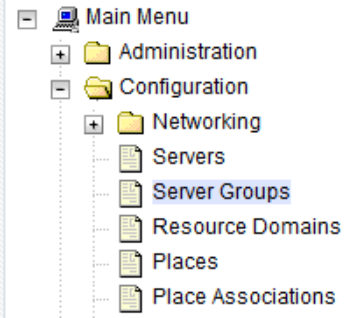
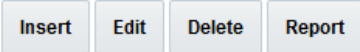
STEP #	Procedure	Description
		<p><b>Note:</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p>
<p>6.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Export the initial configuration</p>	<p>1. Navigate to <b>Configuration &gt; Servers</b>.</p>  <p>2. From the GUI screen, select the NOAM server and click <b>Export</b> to generate the initial configuration data for that server. Go to the Info tab to confirm the file has been created.</p> <div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin: 10px auto;"> <span>Insert</span> <span>Edit</span> <span>Delete</span> <span>Export</span> <span>Report</span> </div>
<p>7.</p> <p><input type="checkbox"/></p>	<p><b>NOAM Server:</b> Copy configuration file to 1<sup>st</sup> NOAM server</p>	<p>1. Obtain a terminal window to the 1<sup>st</sup> NOAM server, logging in as the <b>admusr</b> user.</p> <p>2. Copy the configuration file created in the previous step from the <b>/var/TKLC/db/filemgmt</b> directory on the 1<sup>st</sup> NOAM to the <b>/var/tmp</b> directory. The configuration file has a filename like <b>TKLCConfigData.&lt;hostname&gt;.sh</b>. The following is an example:</p> <pre style="background-color: #f0f0f0; padding: 5px;">\$ sudo cp /var/TKLC/db/filemgmt/TKLCConfigData.&lt;hostname&gt;.sh /var/tmp/TKLCConfigData.sh</pre>
<p>8.</p> <p><input type="checkbox"/></p>	<p><b>First NOAM Server:</b> Wait for configuration to complete</p>	<p>The automatic configuration daemon looks for the file named <b>TKLCConfigData.sh</b> in the <b>/var/tmp</b> directory, implements the configuration in the file, and prompts the user to reboot the server.</p> <p>If you are on the console, wait to be prompted to reboot the server, but <b>DO NOT</b> reboot the server, it is rebooted later in this procedure.</p> <p>Verify the script completed successfully by checking the following file.</p> <pre style="background-color: #f0f0f0; padding: 5px;">\$ sudo cat /var/TKLC/appw/logs/Process/install.log</pre> <p><b>Note:</b> Ignore the warning about removing the USB key since no USB key is present. No response occurs until the reboot prompt is issued.</p>

STEP #	Procedure	Description
9. <input type="checkbox"/>	<b>First NOAM Server:</b> Set the time zone (Optional) and reboot the server	<p>To change the system time zone, from the command line prompt, execute <b>set_ini_tz.pl</b>. The following command example uses the America/New_York time zone.</p> <p>Replace, as appropriate, with the time zone you have selected for this installation. For a full list of valid time zones, see Appendix B List of Frequently Used Time Zones.</p> <pre>\$ sudo /usr/TKLC/appworks/bin/set_ini_tz.pl "America/New_York" &gt;/dev/null 2&gt;&amp;1  \$ date  \$ sudo init 6</pre> <p>Wait for server to reboot.</p>
10. <input type="checkbox"/>	<b>First NOAM Server:</b> Verify server health	<ol style="list-style-type: none"> <li>Log into the NOAM1 as the <b>admusr</b> user.</li> <li>Execute the following command as admusr on the 1<sup>st</sup> NOAM server and make sure no errors are returned: <pre>\$ sudo syscheck  Running modules in class hardware OK  Running modules in class disk OK  Running modules in class net OK  Running modules in class system OK  Running modules in class proc OK  LOG LOCATION: /var/TKLC/log/syscheck/fail_log</pre> </li> </ol>

**Procedure 18. Configure the NOAM Server Group**

STEP #	Procedure	Description
<p>This procedure configures the NOAM server group.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	<b>NOAM GUI:</b> Login	<p>Establish a GUI session on the first NOAM server by using the XMI IP address of the first NOAM server. Open the web browser and type <b>http://&lt;NO1_XMI_IP_Address&gt;</b> as the URL.</p> <p>Login as the <b>guiadmin</b> user. If prompted by a security warning, click <b>Continue to this Website</b> to proceed.</p>

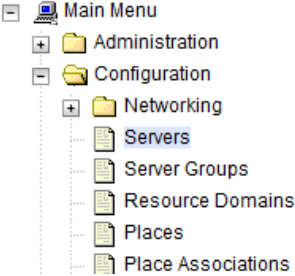
STEP #	Procedure	Description																		
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>NOAM</b>  <b>GUI:</b> Enter NOAM server group data</p>	<p>1. Navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Click <b>Insert</b> and fill in the following fields:</p> <p><b>Server Group Name:</b> [Enter Server Group Name]  <b>Level:</b> A  <b>Parent:</b> None  <b>Function:</b> DSR (Active/Standby Pair)  <b>WAN Replication Connection Count:</b> Use Default Value</p> <p><b>Adding new server group</b></p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Desc</th> </tr> </thead> <tbody> <tr> <td>Server Group Name *</td> <td>ZombieNOAM</td> <td>Uniqu requir</td> </tr> <tr> <td>Level *</td> <td>A</td> <td>Selec</td> </tr> <tr> <td>Parent *</td> <td>NONE</td> <td>Selec</td> </tr> <tr> <td>Function *</td> <td>DSR (active/standby pair)</td> <td>Selec</td> </tr> <tr> <td>WAN Replication Connection Count</td> <td>1</td> <td>Speci</td> </tr> </tbody> </table> <p>Ok Apply Cancel</p> <p>3. Click <b>OK</b> when all fields are filled in.</p>	Field	Value	Desc	Server Group Name *	ZombieNOAM	Uniqu requir	Level *	A	Selec	Parent *	NONE	Selec	Function *	DSR (active/standby pair)	Selec	WAN Replication Connection Count	1	Speci
Field	Value	Desc																		
Server Group Name *	ZombieNOAM	Uniqu requir																		
Level *	A	Selec																		
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Function *	DSR (active/standby pair)	Selec																		
WAN Replication Connection Count	1	Speci																		

STEP #	Procedure	Description									
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Edit the NOAM Server Group</p>	<p>1. Navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Select the new server group and click <b>Edit</b>.</p>  <p>Select the network element that represents the NOAM.</p> <table border="1"> <thead> <tr> <th colspan="3">Site00_noam</th> </tr> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>DsrSite00NOAM00</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>3. In the portion of the screen that lists the servers for the server group, find the NOAM server being configured. Mark the <b>Include in SG</b> checkbox.</p> <p>4. Leave the other box unchecked.</p> <p>5. Click <b>OK</b>.</p>	Site00_noam			Server	SG Inclusion	Preferred HA Role	DsrSite00NOAM00	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare
Site00_noam											
Server	SG Inclusion	Preferred HA Role									
DsrSite00NOAM00	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>NOAM Server:</b> Verify NOAM VM role</p>	<p>1. From console window of the first NOAM VM, execute the <code>ha.mystate</code> command to verify the DbReplication and VIP items under the resourceId column has a value of Active under the role column.</p> <p>You may have to wait a few minutes for it to be in that state.</p> <p>For Example:</p> <pre> [admusr@NO1 ~]\$ ha.mystate resourceId      role          node  DC  subResources  lastUpdate ----- DbReplication  Act/Act      A1348.092  *   0             0527:050750.672 VIP            Act/Act      A1348.092  *   0             0527:050750.673 CAPM_HELP_Proc Act/OOS      A1348.092  *   0             0527:050750.625 DSROAM_Proc   Act/OOS      A1348.092  *   0             0527:050755.725 CAPM_PSFS_Proc Act/Act      A1348.092  *   0             0527:050800.737 [admusr@NO1 ~]\$                     </pre>									

STEP #	Procedure	Description																								
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Restart 1<sup>st</sup> NOAM VM</p>	<p>1. From the NOAM GUI, navigate to <b>Status &amp; Manage &gt; Server</b>.</p>  <p>2. Select the first NOAM server. Click <b>Restart</b>.</p>  <p>3. Click <b>OK</b> on the confirmation screen and wait for restart to complete.</p> 																								
<p>6.</p> <p><input type="checkbox"/></p>	<p><b>NOAM Server:</b> Set sysmetric thresholds for VMs. <b>Note:</b> These commands disable the message rate threshold alarms</p>	<p>From console window of the first NOAM VM, execute the <b>iset</b> commands as <b>admusr</b>:</p> <pre>\$ sudo iset -feventNumber='-1' SysMetricThreshold where "metricId='RoutingMsgRate' and function='DIAM'"</pre> <pre>\$ sudo iset -feventNumber='-1' SysMetricThreshold where "metricId='RxRbarMsgRate' and function='RBAR'"</pre> <pre>\$ sudo iset -feventNumber='-1' SysMetricThreshold where "metricId='RxFabrMsgRate' and function='FABR'"</pre> <p>Verify, if the correct value was configured.</p> <p>For example:</p> <pre>\$ sudo iqt SysMetricThreshold   grep RxFabrIngressMsgRate</pre> <table border="1"> <tbody> <tr> <td>RxFabrMsgRate</td> <td>FABR</td> <td>*C</td> <td>RunningAvg</td> <td>-1</td> <td>38000</td> <td>36000</td> <td>3000</td> </tr> <tr> <td>RxFabrMsgRate</td> <td>FABR</td> <td>**</td> <td>RunningAvg</td> <td>-1</td> <td>32000</td> <td>28000</td> <td>3000</td> </tr> <tr> <td>RxFabrMsgRate</td> <td>FABR</td> <td>-*</td> <td>RunningAvg</td> <td>-1</td> <td>2400</td> <td>20000</td> <td>3000</td> </tr> </tbody> </table>	RxFabrMsgRate	FABR	*C	RunningAvg	-1	38000	36000	3000	RxFabrMsgRate	FABR	**	RunningAvg	-1	32000	28000	3000	RxFabrMsgRate	FABR	-*	RunningAvg	-1	2400	20000	3000
RxFabrMsgRate	FABR	*C	RunningAvg	-1	38000	36000	3000																			
RxFabrMsgRate	FABR	**	RunningAvg	-1	32000	28000	3000																			
RxFabrMsgRate	FABR	-*	RunningAvg	-1	2400	20000	3000																			



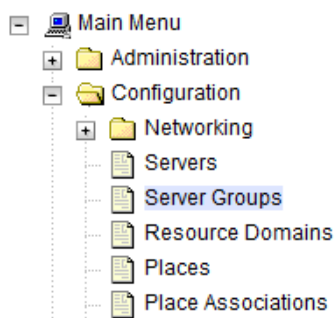
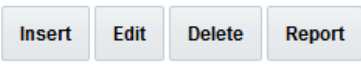
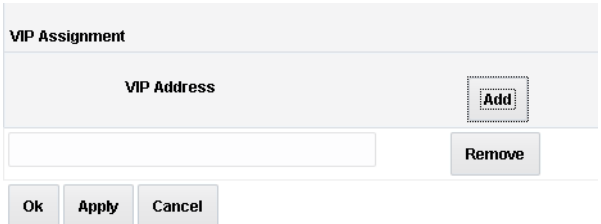
**Procedure 19. Configure the Second NOAM Server**


STEP #	Procedure	Description														
<p>This procedure configures the second NOAM server.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>																
<p>1.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Login</p>	<p>1. If not already done, establish a GUI session on the first NOAM server by using the XMI IP address of the first NOAM server. Open the web browser and type <b>http://&lt;NO1_XMI_IP_Address&gt;</b> as the URL.</p> <p>2. Login as the <b>guiadmin</b> user.</p>														
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Insert the 2nd NOAM VM</p>	<p>1. Navigate to <b>Configuration &gt; Servers</b>.</p>  <p>2. Click <b>Insert</b> to insert the new NOAM server into servers table (the first or server).</p> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Hostname *</td> <td><input type="text"/></td> </tr> <tr> <td>Role *</td> <td>- Select Role - <input type="button" value="v"/></td> </tr> <tr> <td>System ID</td> <td><input type="text"/></td> </tr> <tr> <td>Hardware Profile</td> <td>DSR Guest <input type="button" value="v"/></td> </tr> <tr> <td>Network Element Name *</td> <td>- Unassigned - <input type="button" value="v"/></td> </tr> <tr> <td>Location</td> <td><input type="text"/></td> </tr> </tbody> </table> <p>3. Fill in the fields as follows:</p> <p><b>Hostname:</b> &lt;Hostname&gt;  <b>Role:</b> NETWORK OAM&amp;P  <b>System ID:</b> &lt;Site System ID&gt;  <b>Hardware Profile:</b> DSR Guest  <b>Network Element Name:</b> [Choose NE list]</p>	Attribute	Value	Hostname *	<input type="text"/>	Role *	- Select Role - <input type="button" value="v"/>	System ID	<input type="text"/>	Hardware Profile	DSR Guest <input type="button" value="v"/>	Network Element Name *	- Unassigned - <input type="button" value="v"/>	Location	<input type="text"/>
Attribute	Value															
Hostname *	<input type="text"/>															
Role *	- Select Role - <input type="button" value="v"/>															
System ID	<input type="text"/>															
Hardware Profile	DSR Guest <input type="button" value="v"/>															
Network Element Name *	- Unassigned - <input type="button" value="v"/>															
Location	<input type="text"/>															

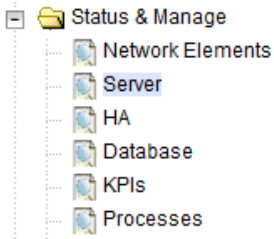
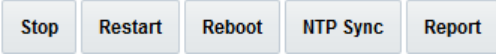
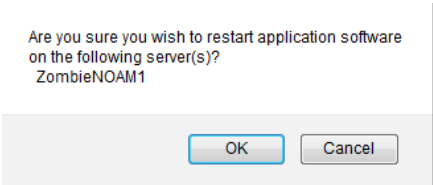
STEP #	Procedure	Description																	
		<p>The network interface fields are now available with selection choices based on the chosen hardware profile and network element.</p> <div> <p>OAM Interfaces [At least one interface is required.]:</p> <table border="1"> <thead> <tr> <th>Network</th> <th>IP Address</th> <th>Interface</th> </tr> </thead> <tbody> <tr> <td>INTERNAL.XMI (10.196.227.0/24)</td> <td>10.196.227.21</td> <td>eth0 <input type="checkbox"/> VLAN (6)</td> </tr> <tr> <td>INTERNAL.IMI (169.254.1.0/24)</td> <td>169.254.1.21</td> <td>eth1 <input type="checkbox"/> VLAN (3)</td> </tr> </tbody> </table> <p>Ok Apply Cancel</p> </div> <ol style="list-style-type: none"> <li>Fill in the server IP addresses for the XMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unmarked.</li> <li>Fill in the server IP addresses for the IMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unmarked.</li> <li>Add the following NTP servers: <div> <table border="1"> <thead> <tr> <th>NTP Server</th> <th>Preferred?</th> </tr> </thead> <tbody> <tr> <td>Valid NTP Server</td> <td>Yes</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> </tbody> </table> </div> </li> <li>Click <b>OK</b> when you have completed entering all the server data.</li> </ol> <p><b>Note:</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p>	Network	IP Address	Interface	INTERNAL.XMI (10.196.227.0/24)	10.196.227.21	eth0 <input type="checkbox"/> VLAN (6)	INTERNAL.IMI (169.254.1.0/24)	169.254.1.21	eth1 <input type="checkbox"/> VLAN (3)	NTP Server	Preferred?	Valid NTP Server	Yes	Valid NTP Server	No	Valid NTP Server	No
Network	IP Address	Interface																	
INTERNAL.XMI (10.196.227.0/24)	10.196.227.21	eth0 <input type="checkbox"/> VLAN (6)																	
INTERNAL.IMI (169.254.1.0/24)	169.254.1.21	eth1 <input type="checkbox"/> VLAN (3)																	
NTP Server	Preferred?																		
Valid NTP Server	Yes																		
Valid NTP Server	No																		
Valid NTP Server	No																		
<p>3. <input type="checkbox"/></p>	<p><b>NOAM GUI:</b> Export the initial configuration</p>	<ol style="list-style-type: none"> <li>Navigate to <b>Configuration &gt; Servers</b>. <div> <pre> Main Menu ├── Administration ├── Configuration │   ├── Networking │   │   ├── Servers │   │   ├── Server Groups │   │   ├── Resource Domains │   │   ├── Places │   │   └── Place Associations </pre> </div> </li> <li>From the GUI screen, select server just configured and click <b>Export</b> to generate the initial configuration data for that server. Go to the Info tab to confirm the file has been created. <div> <p>Insert Edit Delete Export Report</p> </div> </li> </ol>																	

STEP #	Procedure	Description
<p>4.</p> <input type="checkbox"/>	<p><b>First NOAM Server:</b> Copy configuration file to 2<sup>nd</sup> NOAM server</p>	<ol style="list-style-type: none"> <li>Obtain a terminal session to the 1<sup>st</sup> NOAM as the <b>admusr</b> user.</li> <li>Login as the <b>admusr</b> user to the NO1 shell and issue the following commands:   <pre>\$ sudo scp /var/TKLC/db/filemgmt/TKLCConfigData.&lt;hostname&gt;.sh admusr@&lt;ipaddr&gt;:/var/tmp/TKLCConfigData.sh</pre> </li> </ol> <p><b>Note:</b> ipaddr is the IP address of NOAM2 assigned to its ethx interface associated with the xmi network.</p>
<p>5.</p> <input type="checkbox"/>	<p><b>Second NOAM Server:</b> Wait for configuration to complete</p>	<ol style="list-style-type: none"> <li>Obtain a terminal session to the 2<sup>nd</sup> NOAM as the <b>admusr</b> user.  The automatic configuration daemon looks for the file named <b>TKLCConfigData.sh</b> in the <b>/var/tmp</b> directory, implements the configuration in the file, and prompts the user to reboot the server.</li> <li>If you are on the console, wait to be prompted to reboot the server, but <b>DO NOT</b> reboot the server, it is rebooted later in this procedure.</li> <li>Verify script completed successfully by checking the following file.   <pre>\$ sudo cat /var/TKLC/appw/logs/Process/install.log</pre> </li> </ol> <p><b>Note:</b> Ignore the warning about removing the USB key since no USB key is present.</p>
<p>6.</p> <input type="checkbox"/>	<p><b>Second NOAM Server:</b> Reboot the server</p>	<p>Obtain a terminal session to the 2<sup>nd</sup> NOAM as the <b>admusr</b> user.   <pre>\$ sudo init 6</pre> <p>Wait for server to reboot.</p> </p>
<p>7.</p> <input type="checkbox"/>	<p><b>Second NOAM Server:</b> Verify server health</p>	<ol style="list-style-type: none"> <li>Log into the NOAM2 as <b>admusr</b> and wait.</li> <li>Execute the following command as super-user on the 2<sup>nd</sup> NO server and make sure no errors are returned:   <pre>\$ sudo syscheck</pre> <pre>Running modules in class hardware...                                 OK</pre> <pre>Running modules in class disk...                                 OK</pre> <pre>Running modules in class net...                                 OK</pre> <pre>Running modules in class system...                                 OK</pre> <pre>Running modules in class proc...                                 OK</pre> <pre>LOG LOCATION: /var/TKLC/log/syscheck/fail_log</pre> </li> </ol>

**Procedure 20. Complete Configuring the NOAM Server Group**


STEP #	Procedure	Description									
<p>This procedure finishes configuring the NOAM Server Group.                      Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.                      If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>											
<p>1. <input type="checkbox"/></p>	<p><b>NOAM GUI:</b>                      Edit the NOAM Server Group Data</p>	<p>1. From the GUI session on the first NOAM server, navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Select the NOAM server group and click <b>Edit</b>.</p>  <p>3. Add the second NOAM server to the server group by marking the <b>Include in SG</b> checkbox for the second NOAM server. Click <b>Apply</b>.</p> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>NO1</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> <tr> <td>NO2</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>4. Click <b>Add</b> to add a NOAM VIP. Type the VIP Address and click <b>OK</b>.</p> 	Server	SG Inclusion	Preferred HA Role	NO1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare	NO2	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role									
NO1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
NO2	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									

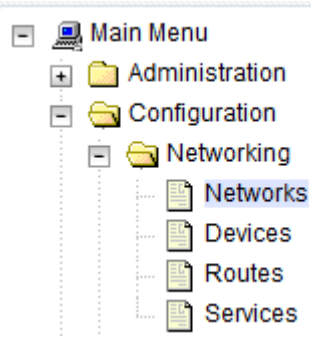


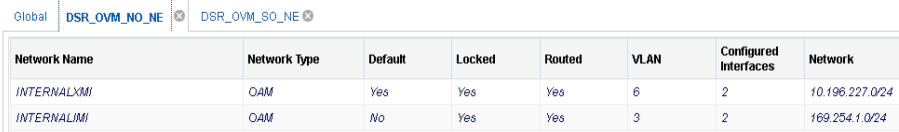
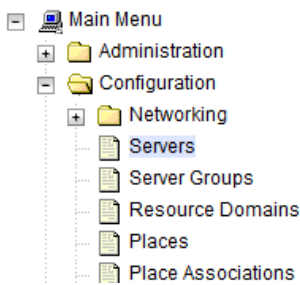
STEP #	Procedure	Description
<p>2.</p> <input type="checkbox"/>	<p>Establish GUI session on the NOAM VIP</p>	<p>Establish a GUI session on the NOAM by using the NOAM VIP address. Login as the <b>guiadmin</b> user.</p>  <p>Welcome to the Oracle System Login.</p> <p>This application is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the <a href="#">Oracle Software Web Browser Support Policy</a> for details.</p> <p>Unauthorized access is prohibited.</p> <p><small>Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.</small></p> <p><small>Copyright © 2010, 2016, <a href="#">Oracle</a> and/or its affiliates. All rights reserved.</small></p>
<p>3.</p> <input type="checkbox"/>	<p>Wait for remote database alarm to clear</p>	<p>Wait for the alarm ID 10200 <b>Remote Database re-initialization in progress</b> to be cleared before proceeding (<b>Alarms &amp; Events &gt; View Active</b>).</p>

STEP #	Procedure	Description
<p>4.</p> <input type="checkbox"/>	<p><b>NOAM GUI:</b> Restart 2<sup>nd</sup> NOAM VM</p>	<p>1. Navigate to <b>Status &amp; Manage &gt; Server</b> and select the second NOAM server.</p>  <p>2. Click <b>Restart</b>.</p>  <p>3. Click <b>OK</b> on the confirmation screen.</p>  <p>Wait approximately 3-5 minutes before proceeding to allow the system to stabilize indicated by having the <b>Appl State</b> as <b>Enabled</b>.</p> <p><b>Note:</b> In case you receive alarm, <b>10073 – Server group max allowed HA Role warning</b>, perform the following:</p> <ol style="list-style-type: none"> <li>1. Log into the SO GUI and navigate to the <b>Status &amp; Manage &gt; HA</b>.</li> <li>2. Click <b>Edit</b> and change the <b>Max Allowed HA role</b> of the current Standby SOAM to <b>Active</b>.</li> </ol>
<p>5.</p> <input type="checkbox"/>	<p>SDS can now be installed (Optional)</p>	<p>If this deployment contains SDS, SDS can now be installed. Refer to document referenced in [6] SDS SW Installation and Configuration Guide.</p>

**Procedure 21. Configure the DR NOAM NE and Server (Optional)**

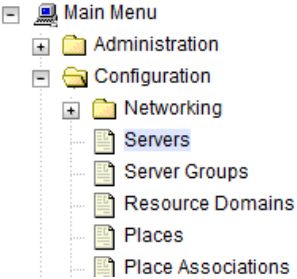
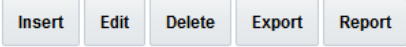
STEP #	Procedure	Description
		<p>This procedure configures the first DR NOAM VM.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
<p>1. <input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI: Login</b></p>	<p>Establish a GUI session on the primary NOAM server by using the XMI VIP IP address.</p>  <p>Welcome to the Oracle System Login.</p> <p>This application is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the <a href="#">Oracle Software Web Browser Support Policy</a> for details.</p> <p>Unauthorized access is prohibited.</p> <hr/> <p><i>Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.</i></p> <p><i>Copyright © 2010, 2016, <a href="#">Oracle</a> and/or its affiliates. All rights reserved.</i></p>

STEP #	Procedure	Description																								
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Create the DR NOAM network element using the XML file</p>	<p>1. Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.</p>  <p>2. Click <b>Browse</b> and type the pathname to the NOAM network XML file.</p>  <p>3. Click <b>Upload File</b> to upload the XML file.</p> <p>To create a new Network Element, upload a valid configuration file:</p>  <p>See the examples in Appendix Sample Network Element and Hardware Profiles and configure the NOAM network element.</p> <p>4. Once the data has been uploaded, you should see a tabs appear with the name of your network element. Click on this tab, which describes the individual networks that are now configured:</p>  <table border="1"> <thead> <tr> <th>Network Name</th> <th>Network Type</th> <th>Default</th> <th>Locked</th> <th>Routed</th> <th>VLAN</th> <th>Configured Interfaces</th> <th>Network</th> </tr> </thead> <tbody> <tr> <td>INTERNALXMI</td> <td>OAM</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>6</td> <td>2</td> <td>10.196.227.0/24</td> </tr> <tr> <td>INTERNALIMI</td> <td>OAM</td> <td>No</td> <td>Yes</td> <td>Yes</td> <td>3</td> <td>2</td> <td>169.254.1.0/24</td> </tr> </tbody> </table>	Network Name	Network Type	Default	Locked	Routed	VLAN	Configured Interfaces	Network	INTERNALXMI	OAM	Yes	Yes	Yes	6	2	10.196.227.0/24	INTERNALIMI	OAM	No	Yes	Yes	3	2	169.254.1.0/24
Network Name	Network Type	Default	Locked	Routed	VLAN	Configured Interfaces	Network																			
INTERNALXMI	OAM	Yes	Yes	Yes	6	2	10.196.227.0/24																			
INTERNALIMI	OAM	No	Yes	Yes	3	2	169.254.1.0/24																			
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Insert the 1st DR NOAM VM</p>	<p>1. Navigate to <b>Configuration &gt; Servers</b>.</p>  <p>2. Click <b>Insert</b> to insert the new NOAM server into servers table (the first or server).</p>																								



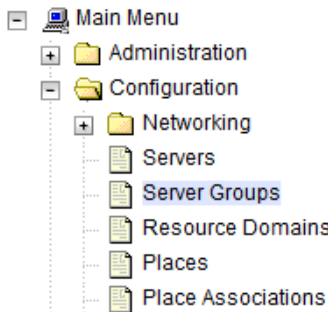
STEP #	Procedure	Description																																		
		<div> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Hostname *</td> <td><input type="text"/></td> </tr> <tr> <td>Role *</td> <td>- Select Role - <input type="button" value="v"/></td> </tr> <tr> <td>System ID</td> <td><input type="text"/></td> </tr> <tr> <td>Hardware Profile</td> <td>DSR Guest <input type="button" value="v"/></td> </tr> <tr> <td>Network Element Name *</td> <td>- Unassigned - <input type="button" value="v"/></td> </tr> <tr> <td>Location</td> <td><input type="text"/></td> </tr> </tbody> </table> </div> <p>3. Fill in the fields as follows:</p> <p><b>Hostname:</b> &lt;Hostname&gt;</p> <p><b>Role:</b> NETWORK OAM&amp;P</p> <p><b>System ID:</b> &lt;Site System ID&gt;</p> <p><b>Hardware Profile:</b> DSR Guest</p> <p><b>Network Element Name:</b> [Select NE from list]</p> <p>The network interface fields are now available with selection choices based on the chosen hardware profile and network element</p> <div> <table border="1"> <thead> <tr> <th colspan="3">OAM Interfaces [At least one interface is required.]:</th> </tr> <tr> <th>Network</th> <th>IP Address</th> <th>Interface</th> </tr> </thead> <tbody> <tr> <td>INTERNAL.XMI (10.196.227.0/24)</td> <td><input type="text" value="10.196.227.21"/></td> <td>eth0 <input type="checkbox"/> VLAN (6)</td> </tr> <tr> <td>INTERNAL.IMI (169.254.1.0/24)</td> <td><input type="text" value="169.254.1.21"/></td> <td>eth1 <input type="checkbox"/> VLAN (3)</td> </tr> </tbody> </table> <p> <input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/> </p> </div> <p>4. Fill in the server IP addresses for the XMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unchecked.</p> <p>5. Fill in the server IP addresses for the IMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unchecked.</p> <p>6. Add the following NTP servers:</p> <table border="1"> <thead> <tr> <th>NTP Server</th> <th>Preferred?</th> </tr> </thead> <tbody> <tr> <td>Valid NTP Server</td> <td>Yes</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> </tbody> </table> <p>7. Click <b>OK</b> when you have completed entering all the server data.</p>	Attribute	Value	Hostname *	<input type="text"/>	Role *	- Select Role - <input type="button" value="v"/>	System ID	<input type="text"/>	Hardware Profile	DSR Guest <input type="button" value="v"/>	Network Element Name *	- Unassigned - <input type="button" value="v"/>	Location	<input type="text"/>	OAM Interfaces [At least one interface is required.]:			Network	IP Address	Interface	INTERNAL.XMI (10.196.227.0/24)	<input type="text" value="10.196.227.21"/>	eth0 <input type="checkbox"/> VLAN (6)	INTERNAL.IMI (169.254.1.0/24)	<input type="text" value="169.254.1.21"/>	eth1 <input type="checkbox"/> VLAN (3)	NTP Server	Preferred?	Valid NTP Server	Yes	Valid NTP Server	No	Valid NTP Server	No
Attribute	Value																																			
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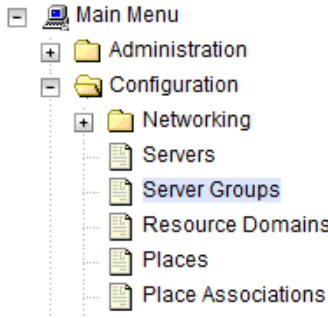
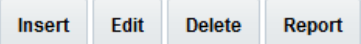
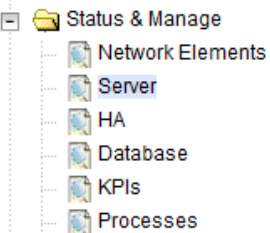
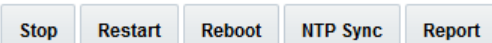
STEP #	Procedure	Description
		<p><b>Note:</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p>
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Export the initial configuration</p>	<p>1. Navigate to <b>Configuration &gt; Servers</b>.</p>  <p>2. From the GUI screen, select the NOAM server and click <b>Export</b> to generate the initial configuration data for that server. Go to the Info tab to confirm the file has been created.</p> 
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM Server:</b> Copy configuration file from the 1<sup>st</sup> Primary NOAM server to the 1<sup>st</sup> NOAM at the DR-NOAM server</p>	<p>1. Obtain a terminal window to the Primary NOAM server, logging in as the <b>admusr</b> user.</p> <p>2. Copy the configuration file created in the previous step from the <b>/var/TKLC/db/filemgmt</b> directory on the 1<sup>st</sup> NOAM at the DR-NOAM server in the <b>/var/tmp</b> directory. The configuration file has a filename like <b>TKLCConfigData.&lt;hostname&gt;.sh</b>. The following is an example:</p> <pre>\$ sudo scp /var/TKLC/db/filemgmt/TKLCConfigData.&lt;hostname&gt;.sh /var/tmp/TKLCConfigData.sh</pre>
<p>6.</p> <p><input type="checkbox"/></p>	<p><b>First DR NOAM Server:</b> Wait for configuration to complete</p>	<p>The automatic configuration daemon looks for the file named <b>TKLCConfigData.sh</b> in the <b>/var/tmp</b> directory, implements the configuration in the file, and prompts the user to reboot the server.</p> <p>If you are on the console, wait to be prompted to reboot the server, but <b>DO NOT</b> reboot the server, it is rebooted later in this procedure.</p> <p>Verify the script completed successfully by checking the following file.</p> <pre>\$ sudo cat /var/TKLC/appw/logs/Process/install.log</pre> <p><b>Note:</b> Ignore the warning about removing the USB key since no USB key is present. No response occurs until the reboot prompt is issued.</p>
<p>7.</p> <p><input type="checkbox"/></p>	<p><b>First DR NOAM Server:</b> Reboot the server</p>	<p>Obtain a terminal window to the 1<sup>st</sup> DR NOAM server, logging in as the admusr user.</p> <pre>\$ sudo init 6</pre> <p>Wait for server to reboot.</p>

STEP #	Procedure	Description
<input type="checkbox"/> 8.	<b>First DR NOAM Server:</b> Verify server health	1. Obtain a terminal window to the 1 <sup>st</sup> DR NOAM server, logging in as the <b>admusr</b> user. 2. Execute the following command as admusr and make sure that no errors are returned: <pre> \$ sudo syscheck Running modules in class hardware...                                 OK Running modules in class disk...                                 OK Running modules in class net...                                 OK Running modules in class system...                                 OK Running modules in class proc...                                 OK  LOG LOCATION: /var/TKLC/log/syscheck/fail_log                     </pre>

**Procedure 22. Configure the DR NOAM Server Group (Optional)**

STEP #	Procedure	Description
This procedure configures the DR NOAM server group. Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.		
<input type="checkbox"/> 1.	<b>Primary NOAM VIP GUI:</b> Login	1. Establish a GUI session on the primary NOAM server by using the XMI IP address of the first NOAM server. Open the web browser and type <b>http://&lt;NO1_XMI_IP_Address&gt;</b> as the URL. 2. Login as the <b>guiadmin</b> user. If prompted by a security warning, click <b>Continue to this Website</b> to proceed.

STEP #	Procedure	Description																		
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Enter DR NOAM server group data</p>	<p>1. Using the GUI session on the primary NOAM server, navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Click <b>Insert</b> and fill in the following fields:</p> <p><b>Server Group Name:</b> [Enter Server Group Name]  <b>Level:</b> A  <b>Parent:</b> None  <b>Function:</b> DSR (Active/Standby Pair)  <b>WAN Replication Connection Count:</b> Use Default Value</p> <p><b>Adding new server group</b></p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Desc</th> </tr> </thead> <tbody> <tr> <td>Server Group Name *</td> <td>ZombieNOAM</td> <td>Uniqu requir</td> </tr> <tr> <td>Level *</td> <td>A</td> <td>Selec</td> </tr> <tr> <td>Parent *</td> <td>NONE</td> <td>Selec</td> </tr> <tr> <td>Function *</td> <td>DSR (active/standby pair)</td> <td>Selec</td> </tr> <tr> <td>WAN Replication Connection Count</td> <td>1</td> <td>Speci</td> </tr> </tbody> </table> <p>Ok Apply Cancel</p> <p>3. Click <b>OK</b> when all fields are filled in.</p>	Field	Value	Desc	Server Group Name *	ZombieNOAM	Uniqu requir	Level *	A	Selec	Parent *	NONE	Selec	Function *	DSR (active/standby pair)	Selec	WAN Replication Connection Count	1	Speci
Field	Value	Desc																		
Server Group Name *	ZombieNOAM	Uniqu requir																		
Level *	A	Selec																		
Parent *	NONE	Selec																		
Function *	DSR (active/standby pair)	Selec																		
WAN Replication Connection Count	1	Speci																		

STEP #	Procedure	Description						
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Edit the DR NOAM server group</p>	<p>1. Navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Select the new server group and click <b>Edit</b>.</p>  <p>3. Select the network element that represents the DR NOAM.</p> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>DSRDRNO1</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>4. In the portion of the screen that lists the servers for the server group, find the NOAM server being configured. Mark the <b>Include in SG</b> checkbox.</p> <p>5. Leave other boxes unchecked.</p> <p>6. Click <b>OK</b>.</p>	Server	SG Inclusion	Preferred HA Role	DSRDRNO1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role						
DSRDRNO1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare						
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Restart 1<sup>st</sup> DR NOAM VM</p>	<p>1. From the NOAM GUI, navigate to <b>Status &amp; Manage &gt; Server</b>.</p>  <p>2. Select the first NOAM server. Click <b>Restart</b>.</p>  <p>3. Click <b>OK</b> on the confirmation screen and wait for restart to complete.</p> <div> <p>Are you sure you wish to restart application software on the following server(s)? ZombieNOAM1</p> <p><input type="button" value="OK"/> <input type="button" value="Cancel"/></p> </div>						

**Procedure 23. Configure the Second DR NOAM Server (Optional)**

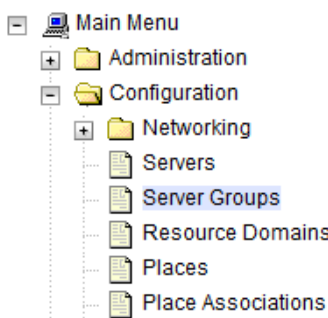
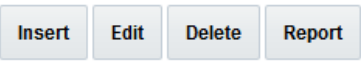
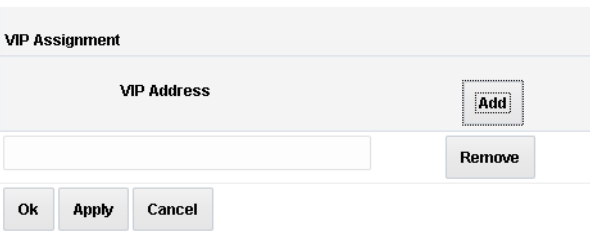
STEP #	Procedure	Description														
<p>This procedure configures the second DR NOAM server.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>																
<p>1.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI: Login</b></p>	<p>1. If not already done, establish a GUI session on the first NOAM server by using the XMI IP address of the first NOAM server. Open the web browser and type <b>http://&lt;NOAM1_XMI_IP_Address&gt;</b> as the URL.</p> <p>2. Login as the <b>guiadmin</b> user.</p>														
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI: Insert the 2nd DR NOAM VM</b></p>	<p>1. Navigate to <b>Main Menu &gt; Configuration &gt; Servers.</b></p> <div> <pre> Main Menu ├── Administration ├── Configuration │   ├── Networking │   │   ├── Servers │   │   ├── Server Groups │   │   ├── Resource Domains │   │   ├── Places │   │   └── Place Associations </pre> </div> <p>2. Click <b>Insert</b> to insert the new NOAM server into servers table (the first or second server).</p> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Hostname *</td> <td><input type="text"/></td> </tr> <tr> <td>Role *</td> <td>- Select Role - <input type="button" value="v"/></td> </tr> <tr> <td>System ID</td> <td><input type="text"/></td> </tr> <tr> <td>Hardware Profile</td> <td>DSR Guest <input type="button" value="v"/></td> </tr> <tr> <td>Network Element Name *</td> <td>- Unassigned - <input type="button" value="v"/></td> </tr> <tr> <td>Location</td> <td><input type="text"/></td> </tr> </tbody> </table> <p>3. Fill in the fields as follows:</p> <p><b>Hostname:</b> &lt;Hostname&gt;</p> <p><b>Role:</b> NETWORK OAM&amp;P</p> <p><b>System ID:</b> &lt;Site System ID&gt;</p> <p><b>Hardware Profile:</b> DSR Guest</p> <p><b>Network Element Name:</b> [Choose NE from list]</p>	Attribute	Value	Hostname *	<input type="text"/>	Role *	- Select Role - <input type="button" value="v"/>	System ID	<input type="text"/>	Hardware Profile	DSR Guest <input type="button" value="v"/>	Network Element Name *	- Unassigned - <input type="button" value="v"/>	Location	<input type="text"/>
Attribute	Value															
Hostname *	<input type="text"/>															
Role *	- Select Role - <input type="button" value="v"/>															
System ID	<input type="text"/>															
Hardware Profile	DSR Guest <input type="button" value="v"/>															
Network Element Name *	- Unassigned - <input type="button" value="v"/>															
Location	<input type="text"/>															


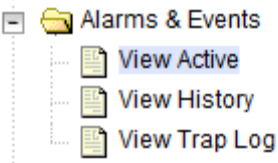
STEP #	Procedure	Description																	
		<p>The network interface fields are now available with selection choices based on the chosen hardware profile and network element.</p> <div style="border: 1px solid gray; padding: 5px;"> <p>OAM Interfaces [At least one interface is required.]:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Network</th> <th style="width: 33%;">IP Address</th> <th style="width: 34%;">Interface</th> </tr> </thead> <tbody> <tr> <td>INTERNAL.XMI (10.196.227.0/24)</td> <td>10.196.227.21</td> <td>eth0 <input type="checkbox"/> VLAN (6)</td> </tr> <tr> <td>INTERNAL.IMI (169.254.1.0/24)</td> <td>169.254.1.21</td> <td>eth1 <input type="checkbox"/> VLAN (3)</td> </tr> </tbody> </table> <p style="text-align: center;"> <input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/> </p> </div> <ol style="list-style-type: none"> <li>4. Fill in the server IP addresses for the XMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unmarked.</li> <li>5. Fill in the server IP addresses for the IMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unmarked.</li> <li>6. Add the following NTP servers:           <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 60%;">NTP Server</th> <th style="width: 40%;">Preferred?</th> </tr> </thead> <tbody> <tr> <td>Valid NTP Server</td> <td>Yes</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> </tbody> </table> </li> <li>7. Click <b>OK</b> when you have completed entering all the server data.</li> </ol> <p><b>Note:</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p>	Network	IP Address	Interface	INTERNAL.XMI (10.196.227.0/24)	10.196.227.21	eth0 <input type="checkbox"/> VLAN (6)	INTERNAL.IMI (169.254.1.0/24)	169.254.1.21	eth1 <input type="checkbox"/> VLAN (3)	NTP Server	Preferred?	Valid NTP Server	Yes	Valid NTP Server	No	Valid NTP Server	No
Network	IP Address	Interface																	
INTERNAL.XMI (10.196.227.0/24)	10.196.227.21	eth0 <input type="checkbox"/> VLAN (6)																	
INTERNAL.IMI (169.254.1.0/24)	169.254.1.21	eth1 <input type="checkbox"/> VLAN (3)																	
NTP Server	Preferred?																		
Valid NTP Server	Yes																		
Valid NTP Server	No																		
Valid NTP Server	No																		
<p>3. <input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Export the initial configuration</p>	<ol style="list-style-type: none"> <li>1. Navigate to <b>Configuration &gt; Servers</b>.           <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <ul style="list-style-type: none"> <li><input type="checkbox"/> Main Menu</li> <li><input type="checkbox"/> Administration</li> <li><input checked="" type="checkbox"/> Configuration               <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Networking                   <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Servers</li> <li>Server Groups</li> <li>Resource Domains</li> <li>Places</li> <li>Place Associations</li> </ul> </li> </ul> </li> </ul> </div></li> </ol>																	

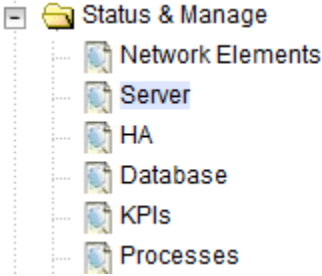
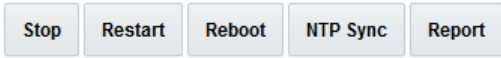
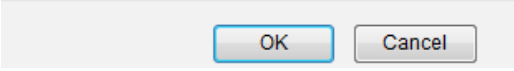
STEP #	Procedure	Description
<p>4.</p> <input type="checkbox"/>	<p><b>Primary NOAM:</b> Copy configuration file to 2<sup>nd</sup> DR NOAM server</p>	<ol style="list-style-type: none"> <li>Obtain a terminal session to the primary NOAM as the <b>admusr</b> user.</li> <li>Login as the <b>admusr</b> user to the NOAM1 shell and issue the following commands:   <pre>\$ sudo scp /var/TKLC/db/filemgmt/TKLCConfigData.&lt;hostname&gt;.sh admusr@&lt;ipaddr&gt;:/var/tmp/TKLCConfigData.sh</pre> </li> </ol> <p><b>Note:</b> ipaddr is the IP address of DR NOAM assigned to its ethx interface associated with the XML network.</p>
<p>5.</p> <input type="checkbox"/>	<p><b>Second DR NOAM Server:</b> Wait for configuration to complete</p>	<ol style="list-style-type: none"> <li>Obtain a terminal session to the 2<sup>nd</sup> DR NOAM as the <b>admusr</b> user.  The automatic configuration daemon looks for the file named <b>TKLCConfigData.sh</b> in the <b>/var/tmp</b> directory, implements the configuration in the file, and prompts the user to reboot the server.</li> <li>If you are on the console, wait to be prompted to reboot the server, but <b>DO NOT</b> reboot the server, it is rebooted later in this procedure.</li> <li>Verify script completed successfully by checking the following file.   <pre>\$ sudo cat /var/TKLC/appw/logs/Process/install.log</pre> </li> </ol> <p><b>Note:</b> Ignore the warning about removing the USB key since no USB key is present.</p>
<p>6.</p> <input type="checkbox"/>	<p><b>Second DR NOAM Server:</b> Reboot the server</p>	<p>Obtain a terminal session to the 2<sup>nd</sup> DR NOAM as the <b>admusr</b> user.   <pre>\$ sudo init 6</pre> <p>Wait for server to reboot.</p> </p>
<p>7.</p> <input type="checkbox"/>	<p><b>Second DR NO Server:</b> Verify server health</p>	<ol style="list-style-type: none"> <li>Obtain a terminal session to the 2<sup>nd</sup> DR NOAM as the <b>admusr</b> user.</li> <li>Execute the following command as super-user and make sure no errors are returned:   <pre>\$ sudo syscheck</pre> <pre>Running modules in class hardware...                                 OK</pre> <pre>Running modules in class disk...                                 OK</pre> <pre>Running modules in class net...                                 OK</pre> <pre>Running modules in class system...                                 OK</pre> <pre>Running modules in class proc...                                 OK</pre> <pre>LOG LOCATION: /var/TKLC/log/syscheck/fail_log</pre> </li> </ol>



**Procedure 24. Complete Configuring the DR NOAM Server Group (Optional)**


STEP #	Procedure	Description									
<p>This procedure finishes configuring the DR NOAM Server Group.                      Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.                      If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>											
<p>1. <input type="checkbox"/></p>	<p><b>PRIMARY NOAM VIP</b>  <b>GUI:</b> Edit the DR NOAM server group data</p>	<p>1. From the GUI session on the primary NOAM server, navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Select the NOAM server group and click <b>Edit</b>.</p>  <p>3. Add the second NOAM server to the server group by marking the <b>Include in SG</b> checkbox for the second NOAM server. Click <b>Apply</b>.</p> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>DSRDRNO1</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> <tr> <td>DSRDRNO2</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>4. Click <b>Add</b> to add an NOAM VIP. Type the <b>VIP Address</b> and click <b>OK</b>.</p> 	Server	SG Inclusion	Preferred HA Role	DSRDRNO1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare	DSRDRNO2	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role									
DSRDRNO1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
DSRDRNO2	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									

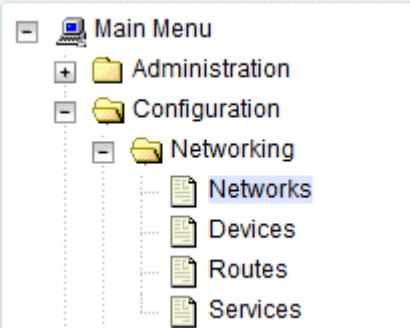
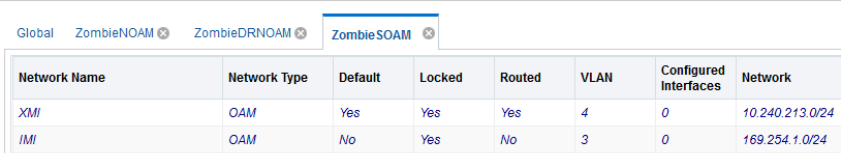
STEP #	Procedure	Description
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Establish GUI Session on the NOAM VIP</p>	<p>Establish a GUI session on the primary NOAM by using the NOAM VIP address. Login as the <b>guidadmin</b> user.</p> 
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Wait for Remote Database Alarm to Clear</p>	<p>Wait for the alarm ID 10200 <b>Remote Database re-initialization in progress</b> to be cleared before proceeding (<b>Alarms &amp; Events &gt; View Active</b>).</p> 

STEP #	Procedure	Description
4. <input type="checkbox"/>	<b>Primary NOAM VIP GUI:</b> Restart 2nd DR NOAM VM	<p>1. Navigate to <b>Status &amp; Manage &gt; Server</b> and select the second DR NOAM server.</p>  <p>2. Click <b>Restart</b>.</p>  <p>3. Answer <b>OK</b> on the confirmation screen.</p>  <p>Wait approximately 3-5 minutes before proceeding to allow the system to stabilize indicated by having the <b>Appl State</b> as <b>Enabled</b>.</p>
5. <input type="checkbox"/>	<b>Primary NOAM:</b> Modify DSR OAM process	<p>Establish an SSH session to the primary NOAM, login as the <b>admusr</b> user. Execute the following commands:</p> <p>1. Retrieve the cluster ID of the DR-NOAM:</p> <pre>\$ sudo iqt -NodeID TopologyMapping where "NodeID='&lt;DR_NOAM_Host_Name&gt;'"</pre> <pre>Server_ID  NodeID                ClusterID 1          Oahu-DSR-DR-NOAM-2          A1055</pre> <p>2. Execute the following command to start the DSR OAM process on the DR-NOAM.</p> <pre>\$ echo "&lt;clusterID&gt; DSROAM_Proc Yes"   iload -ha -xun -fcluster -fresource -foptional HaClusterResourceCfg</pre>

**Procedure 25. Configure the SOAM NE**


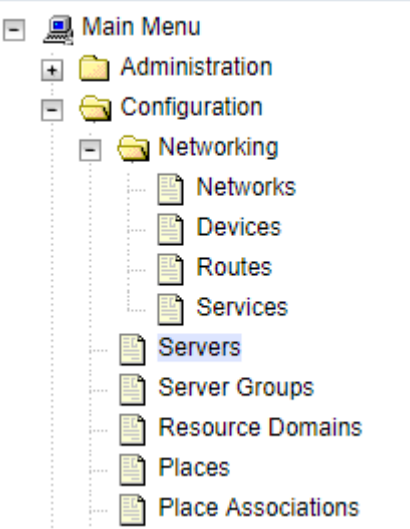
STEP #	Procedure	Description
		<p>This procedure configures the SOAM network element.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
<p>1. <input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Establish GUI session on the NOAM VIP</p>	<p>If needed, establish a GUI session on the NOAM by using the NOAM VIP address. Login as the <b>guiadmin</b> user.</p> 

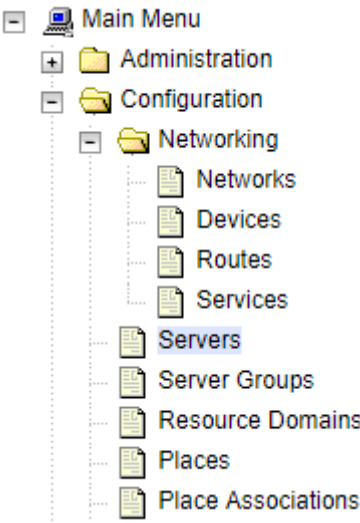

STEP #	Procedure	Description																								
2.	<p><b>Primary NOAM VIP GUI:</b> Create the SOAM network element using an XML file</p>	<p>Make sure to have an SOAM network element XML file available on the PC running the web browser. The SOAM network element XML file is similar to what was created and used in Procedure 17, but defines the SOAM network element.</p> <p>Refer to Appendix Sample Network Element and Hardware Profiles for a sample network element xml file</p> <ol style="list-style-type: none"> <li>1. Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.</li> </ol>  <ol style="list-style-type: none"> <li>2. Click <b>Browse</b> and type the path and name of the SOAM network XML file.</li> </ol> <p>To create a new Network Element, upload a valid configuration file:</p> <p><input type="button" value="Browse..."/> zombieSOAM.xml <input type="button" value="Upload File"/></p> <p><small>Copyright © 2010, 2016, Oracle and/or its affiliates. All rights reserved.</small></p> <ol style="list-style-type: none"> <li>3. Click <b>Upload</b> to upload the XML file and configure the SOAM network element.</li> </ol>  <table border="1"> <thead> <tr> <th>Network Name</th> <th>Network Type</th> <th>Default</th> <th>Locked</th> <th>Routed</th> <th>VLAN</th> <th>Configured Interfaces</th> <th>Network</th> </tr> </thead> <tbody> <tr> <td>XMI</td> <td>OAM</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>4</td> <td>0</td> <td>10.240.213.0/24</td> </tr> <tr> <td>IMI</td> <td>OAM</td> <td>No</td> <td>Yes</td> <td>No</td> <td>3</td> <td>0</td> <td>169.254.1.0/24</td> </tr> </tbody> </table>	Network Name	Network Type	Default	Locked	Routed	VLAN	Configured Interfaces	Network	XMI	OAM	Yes	Yes	Yes	4	0	10.240.213.0/24	IMI	OAM	No	Yes	No	3	0	169.254.1.0/24
Network Name	Network Type	Default	Locked	Routed	VLAN	Configured Interfaces	Network																			
XMI	OAM	Yes	Yes	Yes	4	0	10.240.213.0/24																			
IMI	OAM	No	Yes	No	3	0	169.254.1.0/24																			

**Procedure 26. Configure the SOAM Servers**

STEP #	Procedure	Description
		<p>This procedure configures the SOAM servers.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
<p>1.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Establish GUI session on the NOAM VIP</p>	<p>If needed, establish a GUI session on the NOAM by using the NOAM VIP address. Login as the <b>guidadmin</b> user.</p> 
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Insert the 1<sup>st</sup> SOAM server</p>	<p>1. Navigate to <b>Configuration &gt; Server</b>.</p>  <p>2. Click <b>Insert</b> to insert the new SOAM server into servers table.</p>

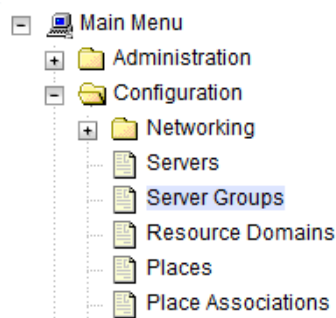
STEP #	Procedure	Description																																		
		<p>3. Fill in the fields as follows:</p> <p><b>Hostname:</b> &lt;SO1-Hostname&gt;  <b>Role:</b> SYSTEM OAM  <b>System ID:</b> &lt;Site System ID&gt;  <b>Hardware Profile:</b> <a href="#">DSR Guest</a>  <b>Network Element Name:</b> [Choose <b>NE</b> from list]</p> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Hostname *</td> <td><input type="text"/></td> </tr> <tr> <td>Role *</td> <td>- Select Role - <input type="button" value="v"/></td> </tr> <tr> <td>System ID</td> <td><input type="text"/></td> </tr> <tr> <td>Hardware Profile</td> <td>DSR Guest <input type="button" value="v"/></td> </tr> <tr> <td>Network Element Name *</td> <td>- Unassigned - <input type="button" value="v"/></td> </tr> <tr> <td>Location</td> <td><input type="text"/></td> </tr> </tbody> </table> <p>The network interface fields are now available with selection choices based on the chosen hardware profile and network element.</p> <table border="1"> <thead> <tr> <th colspan="3">OAM Interfaces [At least one interface is required.]:</th> </tr> <tr> <th>Network</th> <th>IP Address</th> <th>Interface</th> </tr> </thead> <tbody> <tr> <td>INTERNALXMI (10.196.227.0/24)</td> <td><input type="text" value="10.196.227.23"/></td> <td>eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (6)</td> </tr> <tr> <td>INTERNALIMI (169.254.1.0/24)</td> <td><input type="text" value="169.254.1.23"/></td> <td>eth1 <input type="button" value="v"/> <input type="checkbox"/> VLAN (3)</td> </tr> </tbody> </table> <p><input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/></p> <p>4. Fill in the server IP addresses for the XMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unmarked.</p> <p>5. Fill in the server IP addresses for the IMI network. Select <b>ethX</b> for the interface. Leave the <b>VLAN</b> checkbox unmarked.</p> <p>6. Add the following NTP servers:</p> <table border="1"> <thead> <tr> <th>NTP Server</th> <th>Preferred?</th> </tr> </thead> <tbody> <tr> <td>Valid NTP Server</td> <td>Yes</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> <tr> <td>Valid NTP Server</td> <td>No</td> </tr> </tbody> </table> <p>7. Click <b>OK</b> when you have completed entering the server data.</p>	Attribute	Value	Hostname *	<input type="text"/>	Role *	- Select Role - <input type="button" value="v"/>	System ID	<input type="text"/>	Hardware Profile	DSR Guest <input type="button" value="v"/>	Network Element Name *	- Unassigned - <input type="button" value="v"/>	Location	<input type="text"/>	OAM Interfaces [At least one interface is required.]:			Network	IP Address	Interface	INTERNALXMI (10.196.227.0/24)	<input type="text" value="10.196.227.23"/>	eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (6)	INTERNALIMI (169.254.1.0/24)	<input type="text" value="169.254.1.23"/>	eth1 <input type="button" value="v"/> <input type="checkbox"/> VLAN (3)	NTP Server	Preferred?	Valid NTP Server	Yes	Valid NTP Server	No	Valid NTP Server	No
Attribute	Value																																			
Hostname *	<input type="text"/>																																			
Role *	- Select Role - <input type="button" value="v"/>																																			
System ID	<input type="text"/>																																			
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Valid NTP Server	Yes																																			
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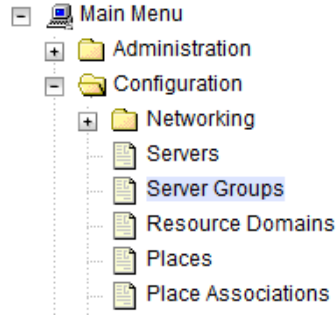
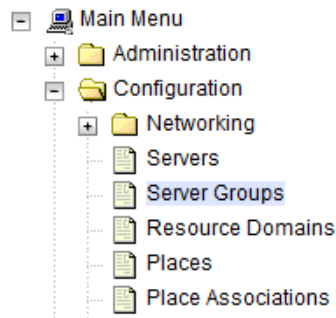
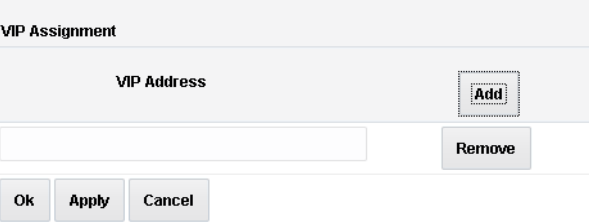
STEP #	Procedure	Description
		<p><b>Note</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p>
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Export the initial configuration</p>	<p>1. Navigate to <b>Configuration &gt; Server</b>.</p>  <p>2. From the GUI screen, select the desired server and click <b>Export</b> to generate the initial configuration data for that server.</p>  <p>3. Go to the Info tab to confirm the file has been created.</p>
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM:</b> Copy configuration file to the 1<sup>st</sup> SOAM server</p>	<p>Login as the <b>admusr</b> user to the NOAM1 shell and issue the commands:</p> <pre>\$ sudo scp /var/TKLC/db/filemgmt/TKLCConfigData.&lt;hostname&gt;.sh admusr@&lt;ipaddr&gt;:/var/tmp/TKLCConfigData.sh</pre>
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>First SOAM Server:</b> Wait for configuration to complete</p>	<p>1. Obtain a terminal session on the 1<sup>st</sup> SOAM as the <b>admusr</b> user.</p> <p>The automatic configuration daemon looks for the file named <b>TKLCConfigData.sh</b> in the /var/tmp directory, implements the configuration in the file, and prompts the user to reboot the server.</p> <p>2. If you are on the console wait to be prompted to reboot the server, but <b>DO NOT</b> reboot the server, it is rebooted later in this procedure.</p> <p>3. Verify script completed successfully by checking the following file.</p> <pre>\$ sudo cat /var/TKLC/appw/logs/Process/install.log</pre> <p><b>Note:</b> Ignore the warning about removing the USB key since no USB key is present.</p>

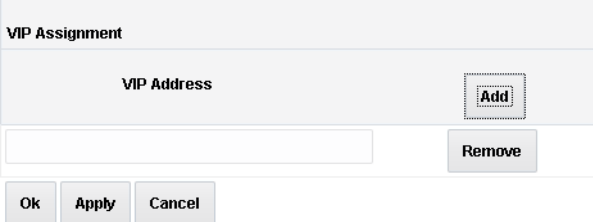
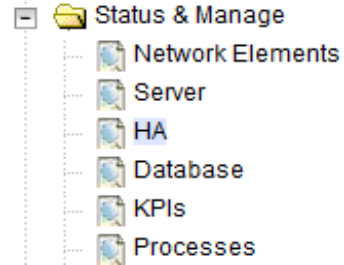


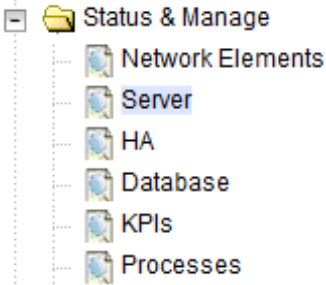
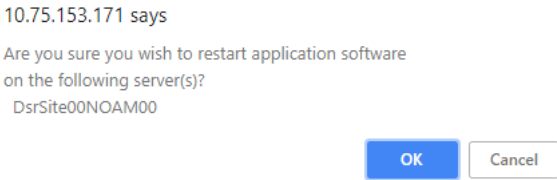
STEP #	Procedure	Description
<p>6.</p> <input type="checkbox"/>	<p><b>First SOAM Server:</b> Reboot the server</p>	<p>Obtain a terminal session to the 1<sup>st</sup> SOAM as the <b>admusr</b> user.</p> <pre>\$ sudo init 6</pre> <p>Wait for server to reboot.</p>
<p>7.</p> <input type="checkbox"/>	<p><b>First SOAM Server:</b> Verify Server Health</p>	<ol style="list-style-type: none"> <li>After the system reboots, login again as the <b>admusr</b> user.</li> <li>Execute the following command and make sure that no errors are returned: <pre># sudo syscheck</pre> <pre>Running modules in class hardware...                                 OK</pre> <pre>Running modules in class disk...                                 OK</pre> <pre>Running modules in class net...                                 OK</pre> <pre>Running modules in class system...                                 OK</pre> <pre>Running modules in class proc...                                 OK</pre> <pre>LOG LOCATION: /var/TKLC/log/syscheck/fail_log</pre> </li> </ol>
<p>8.</p> <input type="checkbox"/>	<p>Insert and Configure the 2<sup>nd</sup> SOAM server, repeat steps 1 through 7 for 2<sup>nd</sup> SOAM</p>	<ol style="list-style-type: none"> <li>Repeat this procedure to insert and configure the 2<sup>nd</sup> SOAM server. Enter the network data for the 2<sup>nd</sup> SOAM server, transfer the <b>TKLCConfigData</b> file to the 2<sup>nd</sup> SOAM server, and reboot the 2<sup>nd</sup> SOAM server when asked at a terminal window.</li> <li>Wait approximately 5 minutes for the 2<sup>nd</sup> SOAM server to reboot.</li> </ol> <p><b>Note:</b> For DSR mated sites, repeat this step for additional/spare SOAM server for mated site.</p>

**Procedure 27. Configure the SOAM Server Group**

STEP #	Procedure	Description
<p>This procedure configures the SOAM server group.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1. <input type="checkbox"/></p>	<p><b>Primary NOAM VIP</b>  <b>GUI:</b> Enter SOAM server group data</p>	<p>1. From the GUI session on the NOAM VIP address, navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Click <b>Insert</b> and add the SOAM server group name along with the values for the following fields:</p> <div style="border: 1px solid gray; padding: 5px; width: fit-content; margin: 10px auto;"> <span>Insert</span> <span>Edit</span> <span>Delete</span> <span>Report</span> </div> <p>Name: [Enter Server Group Name]  Level: B  Parent: [Select the NOAM Server Group]  Function: DSR (Active/Standby Pair)  WAN Replication Connection Count: Use Default Value</p> <p>3. Click <b>OK</b> when all fields are filled.</p> <p><b>Note:</b> For DSR mated sites, repeat this step for additional SOAM server groups where the preferred SOAM spares may be entered before the active/standby SOAMs.</p>

STEP #	Procedure	Description									
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Edit the SOAM server group and add VIP</p>	<p>1. Navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Select the new <b>SOAM</b> server group and click <b>Edit</b>.</p> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>S01</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> <tr> <td>S02</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>3. Add both SOAM servers to the server group primary site by marking the <b>Include in SG</b> checkbox.</p> <p>4. Click <b>Apply</b>.</p>	Server	SG Inclusion	Preferred HA Role	S01	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare	S02	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role									
S01	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
S02	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Add the SOAM VIP</p>	<p>1. Navigate to <b>Configuration &gt; Server Groups</b>.</p>  <p>2. Select the new <b>SOAM</b> server group and click <b>Edit</b>.</p> <p>3. Click <b>Add</b> to add a SOAM VIP. Type the <b>VIP Address</b> and click <b>OK</b>.</p> 									

STEP #	Procedure	Description									
<p>4.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Edit the SOAM server group and add preferred spares for site redundancy (Optional)</p>	<p>If the two-site redundancy feature is wanted for the SOAM server group, add an SOAM server located in its server group secondary site by marking the <b>Include in SG</b> and <b>Preferred Spare</b> checkboxes.</p> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>S01</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> <tr> <td>S02</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input checked="" type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>For more information about server group secondary site or site redundancy, see the Terminology section.</p>	Server	SG Inclusion	Preferred HA Role	S01	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare	S02	<input checked="" type="checkbox"/> Include in SG	<input checked="" type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role									
S01	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
S02	<input checked="" type="checkbox"/> Include in SG	<input checked="" type="checkbox"/> Prefer server as spare									
<p>5.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Edit the SOAM server group and add additional SOAM VIPs (Optional)</p>	<p>1. Click <b>Add</b> to add SOAM VIPs.                  2. Type the <b>VIP Address</b> and click <b>OK</b>.</p> <p><b>Note:</b> Additional SOAM VIPs only apply to SOAM server groups with preferred spare SOAMs.</p> 									
<p>6.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Wait for replication</p>	<p>After replication, the server status should be active (<b>Status &amp; Manage &gt; HA</b>).</p>  <p><b>Note:</b> This may take up to 5 minutes while the servers figure out master/slave relationship.</p> <p>Look for the alarm ID 10200 <b>Remote Database re-initialization in progress</b> to be cleared before proceeding (<b>Alarms &gt; View Active</b>).</p>									

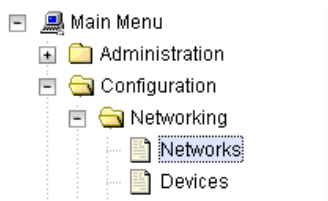
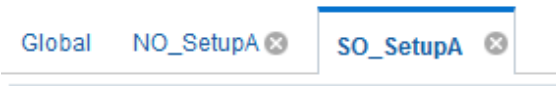

STEP #	Procedure	Description
<p><input type="checkbox"/> 7.</p>	<p><b>Primary NOAM VIP GUI:</b> Restart 1<sup>st</sup> SOAM server</p>	<p>1. From the NOAM GUI, navigate to <b>Status &amp; Manage &gt; Server</b> and select the 1<sup>st</sup> <b>SOAM</b> server.</p>  <p>2. Click <b>Restart</b>.</p> <p>3. Click <b>OK</b> on the confirmation screen.</p>  <p>Wait for restart to complete. Wait for the Appl State to change to Enabled, and all other columns to Norm.</p>
<p><input type="checkbox"/> 8.</p>	<p><b>Primary NOAM VIP GUI:</b> Restart 2<sup>nd</sup> SOAM server</p>	<p>Repeat step 7 for the second SOAM.</p>
<p><input type="checkbox"/> 9.</p>	<p><b>Primary NOAM VIP GUI:</b> Restart all preferred spare SOAM servers (Optional)</p>	<p>1. If additional preferred spare servers are configured for secondary sites, navigate to <b>Status &amp; Manage &gt; Server</b> and select all <b>Preferred Spare</b> SOAM servers.</p> <p>2. Click <b>Restart</b>. Click <b>OK</b> to the confirmation popup. Wait for the Appl State to change to <b>Enabled</b> and all other columns to change to <b>Norm</b>.</p>

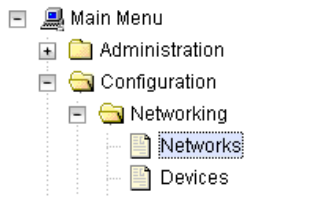

**Procedure 28. Activate PCA/DCA (PCA/DCA Only)**

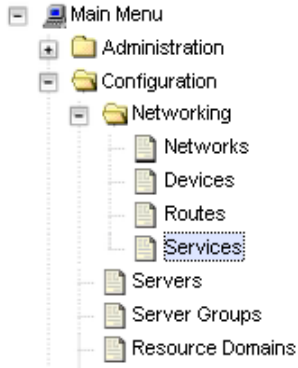
STEP #	Procedure	Description
		<p>This procedure activates PCA/DCA.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
1. <input type="checkbox"/>	(PCA Only) activate PCA feature	If you are installing PCA, execute the applicable procedures (Added SOAM site activation or complete system activation) of the DSR PCA Activation Guide [2] to activate PCA.  <b>Note:</b> If not all SOAM sites are ready at this point, then you should repeat activation for each new SOAM site that comes online.  <b>Note:</b> Ignore steps to restart DA-MPs and SBRs that have yet to be configured.
2. <input type="checkbox"/>	(DCA Only) activate DCA feature	If you are installing PCA, execute [21] DCA Framework and Application Activation and Deactivation Guide to activate the DCA framework and feature.  <b>Note:</b> If not all SOAM sites are ready at this point, then you should repeat activation for each new SOAM site that comes online.  <b>Note:</b> Ignore steps to restart DA-MPs and SBRs that have yet to be configured.

**Procedure 29. Configure the MP Virtual Machines**

STEP #	Procedure	Description
<p>This procedure configures MP VMs (IPFE, SBR, DA-MP, and vSTP). Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	<b>Primary NOAM VIP GUI:</b> Establish GUI Session on the NOAM VIP	<ol style="list-style-type: none"> <li>If needed, establish a GUI session on the NOAM by using the NOAM VIP address.</li> <li>Login as the <b>guiadmin</b> user.</li> </ol>
2. <input type="checkbox"/>	<b>Primary NOAM VIP GUI:</b> Navigate to the signaling network configuration screen	<ol style="list-style-type: none"> <li>Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.   </li> <li>Navigate to the <b>SO Network Element</b> tab under which the MPs are to be configured.   </li> <li>Click <b>Insert</b> in the lower left corner.   </li> </ol>

STEP #	Procedure	Description																											
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI: Add signaling networks</b></p>	<p>The following screen displays:</p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Network Name *</td> <td>XSI2</td> <td>The name of this network. [Default = N/A. Range = Alphanumeric string up to 31 chars, starting with a letter.][A value is required.]</td> </tr> <tr> <td>Network Type</td> <td>Signaling</td> <td>The type of this network.</td> </tr> <tr> <td>VLAN ID *</td> <td>7</td> <td>The VLAN ID to use for this network. [Default = N/A. Range = 1-4094.][A value is required.]</td> </tr> <tr> <td>Network Address *</td> <td>10.196.226.0</td> <td>The network address of this network. [Default = N/A. Range = Valid Network Address of the network in dotted decimal (IPv4) or colon</td> </tr> <tr> <td>Netmask *</td> <td>255.255.255.0</td> <td>Subnetting to apply to servers within this network. [Default = N/A. Range = Valid Netmask for the network in prefix length (IPv4 or IPv6);</td> </tr> <tr> <td>Router IP</td> <td></td> <td>The IP address of a router on this network. If this is a default network, this will be used as the gateway address of the default route or enabled, this address will be the one monitored.</td> </tr> <tr> <td>Default Network</td> <td><input type="radio"/> Yes <input checked="" type="radio"/> No</td> <td>A selection indicating whether this is the network with a default gateway.</td> </tr> <tr> <td>Routed</td> <td><input checked="" type="radio"/> Yes <input type="radio"/> No</td> <td>Whether or not this network is routed outside its network element. If it is not assigned to a network element, it is assumed to be possible.</td> </tr> </tbody> </table> <p>1. Type the <b>Network Name</b>, <b>Network Type</b>, <b>VLAN ID</b>, <b>Network Address</b>, <b>Netmask</b>, and <b>Router IP</b> that matches the signaling network.</p> <p><b>Note:</b> Even if the network does not use VLAN tagging, you should type the correct VLAN ID here as indicated by the NAPD.</p> <ol style="list-style-type: none"> <li>Select <b>Signaling</b> for Network Type.</li> <li>Select <b>No</b> for Default Network.</li> <li>Select <b>Yes</b> for Routable.</li> </ol> <p>2. Click <b>OK</b> if you are finished adding signaling networks</p> <p><b>-OR-</b></p> <p>Click <b>Apply</b> to save this signaling network and repeat this step to enter additional signaling networks.</p>	Field	Value	Description	Network Name *	XSI2	The name of this network. [Default = N/A. Range = Alphanumeric string up to 31 chars, starting with a letter.][A value is required.]	Network Type	Signaling	The type of this network.	VLAN ID *	7	The VLAN ID to use for this network. [Default = N/A. Range = 1-4094.][A value is required.]	Network Address *	10.196.226.0	The network address of this network. [Default = N/A. Range = Valid Network Address of the network in dotted decimal (IPv4) or colon	Netmask *	255.255.255.0	Subnetting to apply to servers within this network. [Default = N/A. Range = Valid Netmask for the network in prefix length (IPv4 or IPv6);	Router IP		The IP address of a router on this network. If this is a default network, this will be used as the gateway address of the default route or enabled, this address will be the one monitored.	Default Network	<input type="radio"/> Yes <input checked="" type="radio"/> No	A selection indicating whether this is the network with a default gateway.	Routed	<input checked="" type="radio"/> Yes <input type="radio"/> No	Whether or not this network is routed outside its network element. If it is not assigned to a network element, it is assumed to be possible.
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<p>4.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI: (PCA/DCA only)</b> Navigate to signaling network configuration screen</p>	<p><b>Note:</b> Execute this step only if you are defining a separate, dedicated network for SBR Replication.</p> <p>1. Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.</p>  <p>2. Click <b>Insert</b> in the lower left corner.</p> 																											

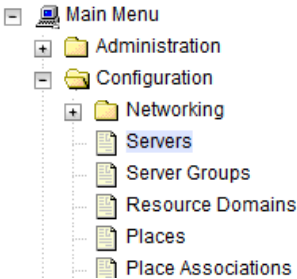

STEP #	Procedure	Description																											
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> (PCA only) Define SBR DB replication network</p>	<p><b>Note:</b> Execute this step only if you are defining a separate, dedicated network for SBR replication.</p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Network Name *</td> <td>Replication</td> <td>The name of this network. [Default = N/A. Range = Alphanumeric string up to 31 chars, starting with a letter.]</td> </tr> <tr> <td>Network Type</td> <td>Signaling</td> <td>The type of this network.</td> </tr> <tr> <td>VLAN ID *</td> <td>9</td> <td>The VLAN ID to use for this network. [Default = N/A. Range = 1-4094.] [A value is required.]</td> </tr> <tr> <td>Network Address *</td> <td>10.196.224.1</td> <td>The network address of this network. [Default = N/A. Range = Valid Network Address of the network in dotted decimal notation.]</td> </tr> <tr> <td>Netmask *</td> <td>255.255.255.0</td> <td>Subnetting to apply to servers within this network. [Default = N/A. Range = Valid Netmask for the network in dotted decimal notation.]</td> </tr> <tr> <td>Router IP</td> <td></td> <td>The IP address of a router on this network. If this is a default network, this will be used as the gateway address. If this is not a default network and routing is enabled, this address will be the one monitored.</td> </tr> <tr> <td>Default Network</td> <td><input type="radio"/> Yes <input checked="" type="radio"/> No</td> <td>A selection indicating whether this is the network with a default gateway.</td> </tr> <tr> <td>Routed</td> <td><input checked="" type="radio"/> Yes <input type="radio"/> No</td> <td>Whether or not this network is routed outside its network element. If it is not assigned to a network element, it will not be routed.</td> </tr> </tbody> </table> <p><input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/></p> <ol style="list-style-type: none"> <li>1. Type the <b>Network Name</b>, <b>Network Type</b>, <b>VLAN ID</b>, <b>Network Address</b>, <b>Netmask</b>, and <b>Router IP</b> that matches the SBR DB replication network.                     <p><b>Note:</b> Even if the network does not use VLAN tagging, you should type the correct VLAN ID here as indicated by the NAPD.</p> <ol style="list-style-type: none"> <li>a. Select <b>No</b> for Default Network.</li> <li>b. Select <b>Yes</b> for Routable.</li> </ol> </li> <li>2. Click <b>OK</b> if you are finished adding signaling networks.</li> </ol> <p><b>-OR-</b></p> <p>Click <b>Apply</b> to save this signaling network and repeat this step to enter additional signaling networks.</p>	Field	Value	Description	Network Name *	Replication	The name of this network. [Default = N/A. Range = Alphanumeric string up to 31 chars, starting with a letter.]	Network Type	Signaling	The type of this network.	VLAN ID *	9	The VLAN ID to use for this network. [Default = N/A. Range = 1-4094.] [A value is required.]	Network Address *	10.196.224.1	The network address of this network. [Default = N/A. Range = Valid Network Address of the network in dotted decimal notation.]	Netmask *	255.255.255.0	Subnetting to apply to servers within this network. [Default = N/A. Range = Valid Netmask for the network in dotted decimal notation.]	Router IP		The IP address of a router on this network. If this is a default network, this will be used as the gateway address. If this is not a default network and routing is enabled, this address will be the one monitored.	Default Network	<input type="radio"/> Yes <input checked="" type="radio"/> No	A selection indicating whether this is the network with a default gateway.	Routed	<input checked="" type="radio"/> Yes <input type="radio"/> No	Whether or not this network is routed outside its network element. If it is not assigned to a network element, it will not be routed.
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<p>6.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> (PCA only) Perform additional service to networks mapping</p>	<p><b>Note:</b> Execute this step only if you are defining a separate, dedicated network for SBR replication.</p> <ol style="list-style-type: none"> <li>1. Navigate to <b>Configuration &gt; Networking &gt; Services</b>.                      </li> <li>2. Click <b>Edit</b>.</li> </ol>																											



STEP #	Procedure	Description																																	
		<div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> <span style="border: 1px solid gray; padding: 2px 5px; margin-right: 5px;">Edit</span> <span style="border: 1px solid gray; padding: 2px 5px;">Report</span> </div> <p>3. Set the services using one of the following scenarios:</p> <ul style="list-style-type: none"> <li> <b>If the dual-path HA configuration is required:</b> <p>For HA_MP_Secondary, Oracle recommends the inter-NE network is set as the XMI network and intra-NE network is set as the IMI network. If the primary interface (Replication_MP) SBR DB Replication Network interface goes down, use the secondary network for sharing HA status to reduce the likelihood of a split brain. This leads to DSR mate isolation from the active SBR and results in traffic loss until SBR DB Replication Network is down.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Name</th> <th style="width: 33%;">Intra-NE Network</th> <th style="width: 33%;">Inter-NE Network</th> </tr> </thead> <tbody> <tr> <td>HA_MP_Secondary</td> <td>&lt;IMI Network&gt;</td> <td>&lt;XMI Network&gt;</td> </tr> <tr> <td>Replication_MP</td> <td>&lt;IMI Network&gt;</td> <td>&lt;SBR DB Replication Network&gt;</td> </tr> <tr> <td>ComAgent</td> <td>&lt;IMI Network&gt;</td> <td>&lt;SBR DB Replication Network&gt;</td> </tr> </tbody> </table> <div style="margin-top: 10px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">HA_MP_Secondary</td> <td style="width: 35%;">INTERNALIMI <input type="text"/></td> <td style="width: 35%;">INTERNALXMI <input type="text"/></td> </tr> <tr> <td>Replication_MP</td> <td>INTERNALIMI <input type="text"/></td> <td>Replication <input type="text"/></td> </tr> <tr> <td>ComAgent</td> <td>INTERNALIMI <input type="text"/></td> <td>Replication <input type="text"/></td> </tr> </table> </div> </li> <li> <b>If the dual-path HA configuration is NOT required:</b> <p>The intra-NE network is set as the IMI network and inter-NE network is set as the PCA replication network (configured in step 5. This may lead to a split database scenario in case the SBR DB Replication Network interface goes down. Due to this, an active SBR server in each site is in effect.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Name</th> <th style="width: 33%;">Intra-NE Network</th> <th style="width: 33%;">Inter-NE Network</th> </tr> </thead> <tbody> <tr> <td>HA_MP_Secondary</td> <td>&lt;IMI Network&gt;</td> <td>&lt;SBR DB Replication Network&gt;</td> </tr> <tr> <td>Replication_MP</td> <td>&lt;IMI Network&gt;</td> <td>&lt;SBR DB Replication Network&gt;</td> </tr> <tr> <td>ComAgent</td> <td>&lt;IMI Network&gt;</td> <td>&lt;SBR DB Replication Network&gt;</td> </tr> </tbody> </table> </li> </ul>	Name	Intra-NE Network	Inter-NE Network	HA_MP_Secondary	<IMI Network>	<XMI Network>	Replication_MP	<IMI Network>	<SBR DB Replication Network>	ComAgent	<IMI Network>	<SBR DB Replication Network>	HA_MP_Secondary	INTERNALIMI <input type="text"/>	INTERNALXMI <input type="text"/>	Replication_MP	INTERNALIMI <input type="text"/>	Replication <input type="text"/>	ComAgent	INTERNALIMI <input type="text"/>	Replication <input type="text"/>	Name	Intra-NE Network	Inter-NE Network	HA_MP_Secondary	<IMI Network>	<SBR DB Replication Network>	Replication_MP	<IMI Network>	<SBR DB Replication Network>	ComAgent	<IMI Network>	<SBR DB Replication Network>
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HA_MP_Secondary	INTERNALIMI ▼	Replication ▼									
Replication_MP	INTERNALIMI ▼	Replication ▼									
ComAgent	INTERNALIMI ▼	Replication ▼									
<p>7. <input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Insert the MP or IPFE server – Part 1</p>	<p>1. Navigate to <b>Configuration &gt; Servers</b>.</p> <div style="border: 1px solid gray; padding: 5px;"> <ul style="list-style-type: none"> <li>[-] Main Menu           <ul style="list-style-type: none"> <li>[+] Administration</li> <li>[-] Configuration               <ul style="list-style-type: none"> <li>[+] Networking                   <ul style="list-style-type: none"> <li>Servers</li> <li>Server Groups</li> <li>Resource Domains</li> <li>Places</li> <li>Place Associations</li> </ul> </li> </ul> </li> </ul> </li> </ul> </div> <p>2. Click <b>Insert</b> to add the new MP or IPFE server into servers table.</p> <div style="border: 1px solid gray; padding: 5px; width: fit-content; margin: 5px auto;"> <span style="border: 1px solid gray; padding: 2px 5px; margin-right: 5px;">Insert</span> <span style="border: 1px solid gray; padding: 2px 5px; margin-right: 5px;">Edit</span> <span style="border: 1px solid gray; padding: 2px 5px; margin-right: 5px;">Delete</span> <span style="border: 1px solid gray; padding: 2px 5px; margin-right: 5px;">Export</span> <span style="border: 1px solid gray; padding: 2px 5px;">Report</span> </div> <p>3. Fill in the following values:</p>									

STEP #	Procedure	Description																																
		<table border="1"> <thead> <tr> <th>Attribute</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Hostname *</td> <td><input type="text"/></td> </tr> <tr> <td>Role *</td> <td>- Select Role - <input type="button" value="v"/></td> </tr> <tr> <td>System ID</td> <td><input type="text"/></td> </tr> <tr> <td>Hardware Profile</td> <td>DSR Guest <input type="button" value="v"/></td> </tr> <tr> <td>Network Element Name *</td> <td>- Unassigned - <input type="button" value="v"/></td> </tr> <tr> <td>Location</td> <td><input type="text"/></td> </tr> </tbody> </table> <p>4. Fill in the fields as follows:</p> <p><b>Hostname:</b> &lt;Hostname&gt;</p> <p><b>Role:</b> <a href="#">MP</a></p> <p><b>System ID:</b> &lt;Site System ID&gt;</p> <p><b>Hardware Profile:</b> <a href="#">DSR Guest</a></p> <p><b>Network Element Name:</b> [Choose <b>NE</b> from list]</p> <table border="1"> <thead> <tr> <th colspan="3">OAM Interfaces [At least one interface is required.]</th> </tr> <tr> <th>Network</th> <th>IP Address</th> <th>Interface</th> </tr> </thead> <tbody> <tr> <td>INTERNALXMI (10.196.227.0/24)</td> <td><input type="text" value="10.196.227."/></td> <td>eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (6)</td> </tr> <tr> <td>INTERNALIMI (169.254.1.0/24)</td> <td><input type="text" value="169.254.1."/></td> <td>eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (3)</td> </tr> <tr> <td>XSI-1 (10.196.228.0/25)</td> <td><input type="text" value="10.196.228."/></td> <td>eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (26)</td> </tr> <tr> <td>XSI-2 (10.196.128.0/25)</td> <td><input type="text" value="10.196.228."/></td> <td>eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (27)</td> </tr> </tbody> </table> <p>5. For the XMI network, type the MP's XMI IP address. Select the correct interface.</p> <p>6. Leave the <b>VLAN</b> checkbox unmarked.</p>	Attribute	Value	Hostname *	<input type="text"/>	Role *	- Select Role - <input type="button" value="v"/>	System ID	<input type="text"/>	Hardware Profile	DSR Guest <input type="button" value="v"/>	Network Element Name *	- Unassigned - <input type="button" value="v"/>	Location	<input type="text"/>	OAM Interfaces [At least one interface is required.]			Network	IP Address	Interface	INTERNALXMI (10.196.227.0/24)	<input type="text" value="10.196.227."/>	eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (6)	INTERNALIMI (169.254.1.0/24)	<input type="text" value="169.254.1."/>	eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (3)	XSI-1 (10.196.228.0/25)	<input type="text" value="10.196.228."/>	eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (26)	XSI-2 (10.196.128.0/25)	<input type="text" value="10.196.228."/>	eth0 <input type="button" value="v"/> <input type="checkbox"/> VLAN (27)
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STEP #	Procedure	Description								
		<p>7. For the IMI network, type the MP's <b>IMI IP address</b>. Select the correct interface.</p> <ol style="list-style-type: none"> <li>Leave the <b>VLAN</b> checkbox unmarked.</li> <li>For the Replication network, type the MP's <b>XSI2 IP address</b>. This is the IP address should be used from the name defined in step 5 above. This name would be the same name that is referred to as <b>SBR DB Replication Network</b> in step 6). Select the correct interface. Leave the <b>VLAN</b> checkbox unmarked.</li> </ol> <p>8. For the XSI1 network, type the MP's <b>XSI1 IP address</b>. Select the correct interface.</p> <ol style="list-style-type: none"> <li>Leave the <b>VLAN</b> checkbox unmarked.</li> </ol> <p>9. For the XSI2 network, type the MP's <b>XSI2 IP address</b>. Select the correct interface.</p> <ol style="list-style-type: none"> <li>Leave the <b>VLAN</b> checkbox unmarked.</li> </ol> <p><b>Note:</b> If more XSI networks are configured, follow the same method of entry as XSI1 and XSI2. All interfaces need to be added sequentially for any server.</p> <p>10. Add the following NTP servers:</p> <table border="1"> <thead> <tr> <th>NTP Server</th> <th>Preferred?</th> </tr> </thead> <tbody> <tr> <td>Valid NTP server</td> <td>Yes</td> </tr> <tr> <td>Valid NTP server</td> <td>No</td> </tr> <tr> <td>Valid NTP server</td> <td>No</td> </tr> </tbody> </table> <p>11. Click <b>OK</b> when all fields are filled in to finish MP server insertion.</p> <p><b>Note:</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p>	NTP Server	Preferred?	Valid NTP server	Yes	Valid NTP server	No	Valid NTP server	No
NTP Server	Preferred?									
Valid NTP server	Yes									
Valid NTP server	No									
Valid NTP server	No									
<p>8.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Export the initial configuration</p>	<p>1. Navigate to <b>Configuration &gt; Networking &gt; Servers</b>.</p>  <p>2. From the GUI screen, select the server that was just configured and click <b>Export</b> to generate the initial configuration data for that server.</p>  <p>3. Go to the Info tab to confirm the file has been created.</p>								

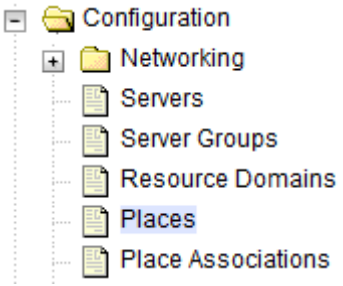
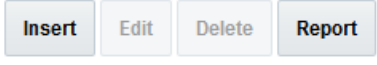
STEP #	Procedure	Description
9. <input type="checkbox"/>	<b>MP Server:</b> Log into the MP	Obtain a terminal window connection on the MP or IPFE server.
10. <input type="checkbox"/>	<b>Primary NOAM VIP GUI:</b> Copy configuration file to MP or IPFE server	From the active NOAM console, login as the <b>admusr</b> user.  <pre>\$ sudo scp /var/TKLC/db/filemgmt/TKLCConfigData.&lt;hostname&gt;.sh admusr@&lt;ipaddr&gt;:/var/tmp/TKLCConfigData.sh</pre> <p><b>Note:</b> ipaddr is the XMI IP address of the MP or IPFE.</p>
11. <input type="checkbox"/>	<b>MP Server:</b> Wait for configuration to complete	<ol style="list-style-type: none"> <li>Obtain a terminal session on the <b>MP or IPFE</b> as the <b>admusr</b> user. The automatic configuration daemon looks for the file named <b>TKLCConfigData.sh</b> in the /var/tmp directory, implements the configuration in the file, and prompts the user to reboot the server.</li> <li>If you are on the console, wait to be prompted to reboot the server, but <b>DO NOT</b> reboot the server, it is rebooted later in this procedure.</li> <li>Verify script completed successfully by checking the following file.   <pre>\$ sudo cat /var/TKLC/appw/logs/Process/install.log</pre> </li> </ol> <p><b>Note:</b> Ignore the warning about removing the USB key since no USB key is present.</p>
12. <input type="checkbox"/>	<b>MP Server:</b> Reboot the server	Obtain a terminal session on the <b>MP or IPFE</b> as the <b>admusr</b> user.  <pre>\$ sudo init 6</pre> <p>Wait for server to reboot.</p>
13. <input type="checkbox"/>	<b>MP Server:</b> Verify server health	<ol style="list-style-type: none"> <li>After the reboot, login as the <b>admusr</b> user.</li> <li>Execute the following command as super-user on the server and make sure that no errors are returned:   <pre>\$ sudo syscheck</pre> <pre>Running modules in class hardware...                                 OK</pre> <pre>Running modules in class disk...                                 OK</pre> <pre>Running modules in class net...                                 OK</pre> <pre>Running modules in class system...                                 OK</pre> <pre>Running modules in class proc...                                 OK</pre> <pre>LOG LOCATION: /var/TKLC/log/syscheck/fail_log</pre> </li> </ol>
14.	<b>MP Server:</b> Delete Auto-	<b>Note:</b> THIS STEP IS <b>OPTIONAL</b> AND SHOULD ONLY BE EXECUTED IF YOU PLAN TO CONFIGURE A <b>DEFAULT ROUTE</b> ON YOUR MP

STEP #	Procedure	Description																		
□	Configured Default Route on MP and Replace it with a Network Route using the XMI Network Network (Optional)	<p>THAT USES A SIGNALING (XSI) NETWORK INSTEAD OF THE XMI NETWORK. Not executing this step means a default route is not configurable on this MP and you have to create separate network routes for each signaling network destination.</p> <ol style="list-style-type: none"> <li>1. Log into the MP as the <b>admusr</b> user. (Alternatively, you can log into the VM's console.)</li> <li>2. Determine &lt;XMI_Gateway_IP&gt; from your SO site network element information.</li> <li>3. Gather the following items:                      &lt;NO_XMI_Network_Address&gt;                      &lt;NO_XMI_Network_Netmask&gt;                 </li> </ol> <p><b>Note:</b> You can either consult the XML files you imported earlier, or go to the NO GUI and view these values from the <b>Configuration &gt; Networking &gt; Networks</b> menu.</p> <ol style="list-style-type: none"> <li>4. Create network routes to the NO's XMI (OAM) network:                     <ol style="list-style-type: none"> <li>a. Navigate to NOAM VIP GUI <b>Configuration &gt; Networking &gt; Routes</b>.</li> <li>b. Select the Specific MP.</li> <li>c. Click <b>Insert</b>.</li> <li>d. Enter details.</li> <li>e. Click <b>OK</b>.</li> </ol> <p style="text-align: center;"><b>Insert Route on DAMP</b></p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>De</th> </tr> </thead> <tbody> <tr> <td>Route Type *</td> <td> <input type="radio"/> Net  <input type="radio"/> Default  <input type="radio"/> Host                 </td> <td>Sel</td> </tr> <tr> <td>Device *</td> <td>- Select Device - ▾</td> <td>Sel Pro</td> </tr> <tr> <td>Destination</td> <td><input type="text"/></td> <td>The</td> </tr> <tr> <td>Netmask</td> <td><input type="text"/></td> <td>A vt</td> </tr> <tr> <td>Gateway IP *</td> <td><input type="text"/></td> <td>The</td> </tr> </tbody> </table> <p style="text-align: center;">Ok   Apply   Cancel</p> </li> <li>5. (Optional) [MP console] If sending SNMP traps from individual servers, create host routes to customer SNMP trap destinations on the XMI network:                     <pre>\$ sudo /usr/TKLC/plat/bin/netAdm add --route=host --address=&lt;Customer_NMS_IP&gt; --gateway=&lt;MP_XMI_Gateway_IP_Address&gt;</pre> </li> </ol>	Field	Value	De	Route Type *	<input type="radio"/> Net <input type="radio"/> Default <input type="radio"/> Host	Sel	Device *	- Select Device - ▾	Sel Pro	Destination	<input type="text"/>	The	Netmask	<input type="text"/>	A vt	Gateway IP *	<input type="text"/>	The
Field	Value	De																		
Route Type *	<input type="radio"/> Net <input type="radio"/> Default <input type="radio"/> Host	Sel																		
Device *	- Select Device - ▾	Sel Pro																		
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Netmask	<input type="text"/>	A vt																		
Gateway IP *	<input type="text"/>	The																		

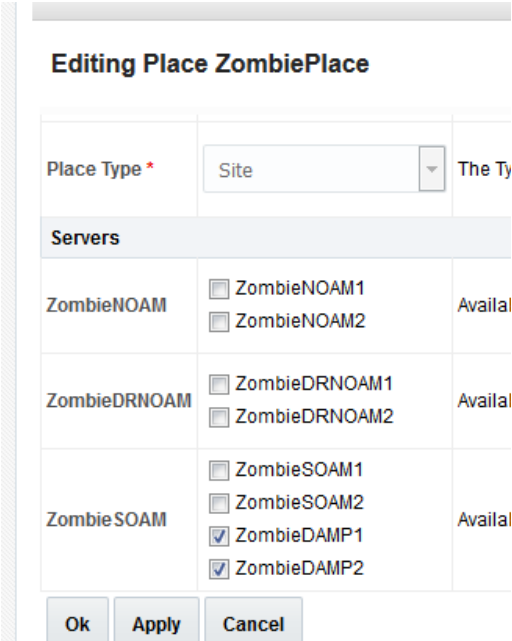
STEP #	Procedure	Description
		<pre>--device=&lt;MP_XMI_Interface&gt;</pre> <p>6. Route to &lt;MP_XMI_Interface&gt; added.</p> <p>7. Repeat for any existing customer NMS stations.</p> <p>8. Delete the existing default route:</p> <pre>\$ sudo /usr/TKLC/plat/bin/netAdm delete -- route=default --gateway=&lt;MP_XMI_Gateway_IP&gt; -- device=&lt;MP_XMI_Interface&gt;</pre> <p>Route to &lt;MP_XMI_Interface&gt; removed.</p> <p>9. [MP Console] Ping active NO XMI IP address to verify connectivity:</p> <pre>\$ ping &lt;ACTIVE_NO_XMI_IP_Address&gt;</pre> <pre>PING 10.240.108.6 (10.240.108.6) 56(84) bytes of data. 64 bytes from 10.240.108.6: icmp_seq=1 ttl=64 time=0.342 ms 64 bytes from 10.240.108.6: icmp_seq=2 ttl=64 time=0.247 ms</pre> <p>10. (Optional) [MP Console] Ping Customer NMS Station(s):</p> <pre>\$ ping &lt;Customer_NMS_IP&gt;</pre> <pre>PING 172.4.116.8 (172.4.118.8) 56(84) bytes of data. 64 bytes from 172.4.116.8: icmp_seq=1 ttl=64 time=0.342 ms 64 bytes from 172.4.116.8: icmp_seq=2 ttl=64 time=0.247 ms</pre> <p>11. If you do not get a response, then verify your network configuration. If you continue to get failures, then halt the installation and contact Oracle customer support.</p>
15. <input type="checkbox"/>	Repeat for remaining MPs and IPFEs	Repeat steps 7 through 14 for all remaining MP (SBR, DA-MP, IPFE and vSTP) servers.

**Procedure 30. Configure Places and Assign MP Servers to Places (PCA and DCA Only)**

STEP #	Procedure	Description
		<p>This procedure adds places in the PCA, and DCA networks.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description															
<p>1.</p> <p><input type="checkbox"/></p>	<p>(PCA Only)  <b>Primary NOAM VIP GUI:</b>            Configure Places</p>	<ol style="list-style-type: none"> <li>Establish a GUI session on the NOAM by using the XMI VIP address. Login as the <b>guiadmin</b> user.</li> <li>Navigate to <b>Configuration &gt; Networking &gt; Places</b>.           <div style="margin-left: 20px;">  </div> </li> <li>Click <b>Insert</b>.           <div style="margin-left: 20px;">  </div> </li> <li>Fill in the fields as follows:           <div style="margin-left: 20px;"> <p><b>Inserting a new Place</b></p> <table border="1"> <thead> <tr> <th colspan="3">Place</th> </tr> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Place Name *</td> <td>ZombiePlace</td> <td>Unique identifier used to label a Place. [Default and space.] [A value is required.]</td> </tr> <tr> <td>Parent *</td> <td>NONE</td> <td>The Parent of this Place [A value is required.]</td> </tr> <tr> <td>Place Type *</td> <td>Site</td> <td>The Type of this Place [A value is required.]</td> </tr> </tbody> </table> <p><b>Place Name:</b> &lt;Site Name&gt;  <b>Parent:</b> NONE  <b>Place Type:</b> Site</p> </div> </li> <li>Repeat this step for each of the PCA/DCA Places (Sites) in the network. See the Terminology section for more information on Sites &amp; Places.</li> </ol>	Place			Field	Value	Description	Place Name *	ZombiePlace	Unique identifier used to label a Place. [Default and space.] [A value is required.]	Parent *	NONE	The Parent of this Place [A value is required.]	Place Type *	Site	The Type of this Place [A value is required.]
Place																	
Field	Value	Description															
Place Name *	ZombiePlace	Unique identifier used to label a Place. [Default and space.] [A value is required.]															
Parent *	NONE	The Parent of this Place [A value is required.]															
Place Type *	Site	The Type of this Place [A value is required.]															



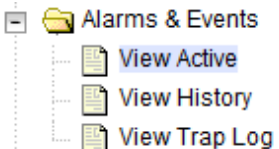
STEP #	Procedure	Description
2. <input type="checkbox"/>	<b>NOAM VIP GUI:</b> Assign MP server to places	<p>1. Select the place configured in step 1 and click <b>Edit</b>.</p>  <p>2. Mark all the checkboxes for PCA/DCA DA-MP and SBR servers that are assigned to this place.</p> <p>3. Repeat this step for all other DA-MP or SBR servers you wish to assign to places.</p> <p><b>Note:</b> All <b>DA-MPs</b> and <b>SBR</b> servers must be added to the <b>Site Place</b> that corresponds to the physical location of the server.</p> <p>See the Terminology section for more information on Sites &amp; Places.</p>

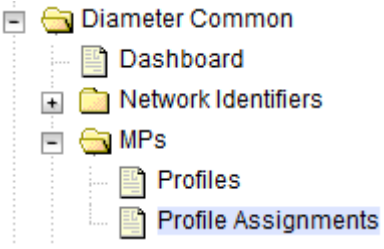
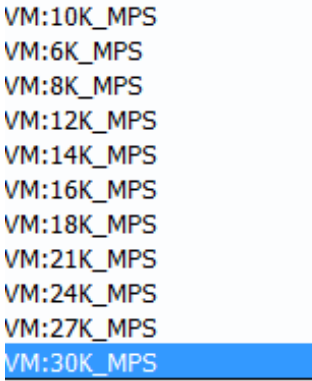
**Procedure 31. Configure the MP Server Group(s) and Profiles**

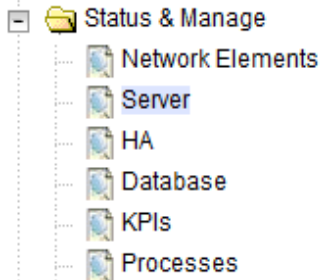
STEP #	Procedure	Description
<p>This procedure configures MP server groups.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	<b>Primary NOAM VIP GUI:</b> Enter MP Server Group Data Applicable to all C level servers (DAMP, IPFE,	<p>1. From the GUI session on the NOAM VIP address, navigate to <b>Configuration &gt; Server Groups</b>.</p>

STEP #	Procedure	Description																					
	VSTP, SBRs)	<div> </div> <p>2. Click <b>Insert</b> and fill out the following fields:</p> <p><b>Server Group Name:</b> [Server Group Name]</p> <p><b>Level:</b> C</p> <p><b>Parent:</b> [SOAM Server Group That is Parent To this MP]</p> <p><b>Function:</b> Select the Proper Function for this MP Server Group:</p> <table border="1"> <thead> <tr> <th>Server Group Function</th> <th>MPs Will Run</th> <th>Redundancy Model</th> </tr> </thead> <tbody> <tr> <td>DSR (multi-active cluster)</td> <td>Diameter Relay and Application Services</td> <td>Multiple MPs Active per SG</td> </tr> <tr> <td>DSR (active-standby pair)</td> <td>Diameter Relay and Application Services</td> <td>1 Active MP and 1 Standby MP/Per SG</td> </tr> <tr> <td>IP Front End</td> <td>IPFE application</td> <td>1 Active MP Per SG</td> </tr> <tr> <td>SBR</td> <td>Policy and Charging Session/or Policy Binding Function/Universal SBR</td> <td>1 Active MP, 1 Standby MP, 2 Optional Spare Per SG</td> </tr> <tr> <td>STP</td> <td>vSTP</td> <td>Multiple vSTP MP per SG</td> </tr> <tr> <td>STPService</td> <td>vSTP</td> <td>MP for the SMS Home Router feature.</td> </tr> </tbody> </table> <p><b>For vSTP:</b></p> <p>If configuring only vSTP application, ignore all other IPFE configuration. Currently, there is no specific MP profile for vSTP MP.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• IPFE interaction with vSTP MP is <b>NOT</b> supported. There is no support of TSA/Auto selection for vSTP MPs.</li> <li>• vSTP MP can co-exist with DA-MP under a SOAM but different server group.</li> <li>• vSTP MP requires 8 GB of RAM.</li> <li>• vSTP STPService MP must be configured if the SMS Home Router feature is activated by the user after the installation is complete.</li> </ul> <p><b>For PCA application:</b></p>	Server Group Function	MPs Will Run	Redundancy Model	DSR (multi-active cluster)	Diameter Relay and Application Services	Multiple MPs Active per SG	DSR (active-standby pair)	Diameter Relay and Application Services	1 Active MP and 1 Standby MP/Per SG	IP Front End	IPFE application	1 Active MP Per SG	SBR	Policy and Charging Session/or Policy Binding Function/Universal SBR	1 Active MP, 1 Standby MP, 2 Optional Spare Per SG	STP	vSTP	Multiple vSTP MP per SG	STPService	vSTP	MP for the SMS Home Router feature.
Server Group Function	MPs Will Run	Redundancy Model																					
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DSR (active-standby pair)	Diameter Relay and Application Services	1 Active MP and 1 Standby MP/Per SG																					
IP Front End	IPFE application	1 Active MP Per SG																					
SBR	Policy and Charging Session/or Policy Binding Function/Universal SBR	1 Active MP, 1 Standby MP, 2 Optional Spare Per SG																					
STP	vSTP	Multiple vSTP MP per SG																					
STPService	vSTP	MP for the SMS Home Router feature.																					

STEP #	Procedure	Description									
		<ul style="list-style-type: none"> <li>Online Charging function(only) At least one MP Server Group with the <b>SBR</b> function must be configured. At least one MP Server Group with the <b>DSR (multi-active cluster)</b> function must be configured.</li> <li>Policy DRA function At least two MP Server Groups with the <b>SBR</b> function must be configured. One stores session data and one stores binding data. At least one MP Server Group with the <b>DSR (multi-active cluster)</b> function must be configured.</li> </ul> <p><b>WAN Replication Connection Count:</b> For non-Policy and Charging SBR Server Groups: <a href="#">Default Value</a> For Policy and Charging Server Groups: <b>8</b></p> <p><b>For the PCA application, the following types of MP Server Groups must be configured:</b> DA-MP (Function: DSR (multi-active cluster)) SBR (Function: SBR) IPFE (Function: IP Front End)</p> <p>3. Click <b>OK</b> when all fields are filled in.</p>									
<p>2.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Repeat for additional server groups</p>	<p>Repeat step 1 for any remaining MP and IPFE server groups you wish to create. For instance, when installing an IPFE, you need to create an IP front end server group for each IPFE server.</p>									
<p>3.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Edit the MP server groups to include MPs</p>	<ol style="list-style-type: none"> <li>Navigate to <b>Configuration &gt; Server Groups</b>, select a server group that you just created, and click <b>Edit</b>.</li> <li>Select the network element representing the MP server group you wish to edit.</li> <li>Mark the <b>Include in SG</b> checkbox for every MP server you wish to include in this server group. Leave other checkboxes blank.</li> </ol> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>DAMP1</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> <tr> <td>DAMP2</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p><b>Note:</b> Each <b>IPFE</b>, and <b>vSTP-MP</b> server should be in its own server group.</p> <p>4. Click <b>OK</b>.</p>	Server	SG Inclusion	Preferred HA Role	DAMP1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare	DAMP2	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role									
DAMP1	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									
DAMP2	<input checked="" type="checkbox"/> Include in SG	<input type="checkbox"/> Prefer server as spare									

STEP #	Procedure	Description						
<p>4.</p> <input type="checkbox"/>	<p>(PCA only)  <b>Primary NOAM VIP GUI:</b> Edit the MP server group and add preferred spares for site redundancy (Optional)</p>	<p>If two-site redundancy for the Policy and Charging SBR Server Group is wanted, add a MP server that is physically located in a separate site (location) to the server group by marking the <b>Include in SG</b> checkbox and also mark the <b>Preferred Spare</b> checkbox.</p> <table border="1"> <thead> <tr> <th>Server</th> <th>SG Inclusion</th> <th>Preferred HA Role</th> </tr> </thead> <tbody> <tr> <td>SBR1</td> <td><input checked="" type="checkbox"/> Include in SG</td> <td><input checked="" type="checkbox"/> Prefer server as spare</td> </tr> </tbody> </table> <p>If three-site redundancy for the SBR MP server group is wanted, add two SBR MP servers that are both physically located in separate sites (location) to the server group by marking the <b>Include in SG</b> and <b>Preferred Spare</b> checkboxes for both servers.</p> <p><b>Note:</b> The preferred spare servers should be different sites from the original server. There should be servers from three separate sites (locations).</p> <p><b>Note:</b> There must first be non-preferred spare present in the server group before adding the preferred spare.</p> <p>For more information about site redundancy for Policy and Charging SBR Server Groups, see the <b>Terminology</b> section.</p> <p>Click <b>OK</b> to save.</p>	Server	SG Inclusion	Preferred HA Role	SBR1	<input checked="" type="checkbox"/> Include in SG	<input checked="" type="checkbox"/> Prefer server as spare
Server	SG Inclusion	Preferred HA Role						
SBR1	<input checked="" type="checkbox"/> Include in SG	<input checked="" type="checkbox"/> Prefer server as spare						
<p>5.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Repeat For additional server groups</p>	<p>Repeat steps 1 through 4 for any remaining MP and IPFE server groups you need to create.</p>						
<p>6.</p> <input type="checkbox"/>	<p><b>Primary NOAM VIP GUI:</b> Wait for replication to complete on all MPs</p>	<p>Wait for the alarm 10200: <b>Remote Database re-initialization in progress</b> to be cleared (<b>Alarms &amp; Events &gt; Active Alarms</b>).</p>  <p>This should happen shortly after you have verified the <b>Norm</b> DB status in the previous step.</p>						

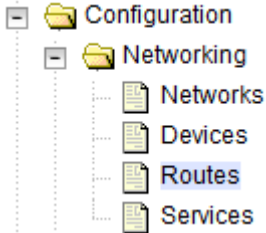
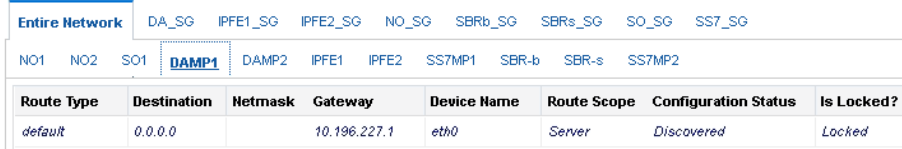

STEP #	Procedure	Description				
<p>7.</p> <p><input type="checkbox"/></p>	<p><b>SOAM VIP GUI:</b> Assign profiles to DA-MPs from SOAM GUI</p>	<ol style="list-style-type: none"> <li>Log into the GUI of the active SOAM server as the <b>guiadmin</b> user.</li> <li>From the SO GUI, navigate to <b>Diameter Common &gt; MPs &gt; Profiles Assignments</b>.                     <div style="margin-left: 20px;">  </div> <div style="margin-left: 20px;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">DA-MP</th> <th style="width: 80%;">MP Profile</th> </tr> </thead> <tbody> <tr> <td>DA1</td> <td>VM:30K_MPS</td> </tr> </tbody> </table> </div> </li> <li>For each MP, select the proper profile assignment based on the MP's type and the function it serves:                     <div style="margin-left: 20px;">  </div> </li> <li>When finished, click <b>Assign</b>.</li> </ol>	DA-MP	MP Profile	DA1	VM:30K_MPS
DA-MP	MP Profile					
DA1	VM:30K_MPS					

STEP #	Procedure	Description
<p>8.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Restart MP VM</p>	<p>1. From the NOAM GUI, navigate to <b>Status &amp; Manage &gt; Server</b>.</p> <div style="margin-left: 20px;">  <p>The screenshot shows a tree view under 'Status &amp; Manage'. The 'Server' item is highlighted in blue. Other items listed are Network Elements, HA, Database, KPIs, and Processes.</p> </div> <p>2. For each MP server:</p> <ol style="list-style-type: none"> <li>a. Select the MP server.</li> <li>b. Click <b>Restart</b>.</li> <li>c. Click <b>OK</b> on the confirmation screen. Wait for the message that tells you that the restart was successful.</li> </ol> <p><b>Policy and Charging DRA/DCA Installations:</b> You may continue to see alarms related to ComAgent until you complete PCA/DCA installation.</p>

## 5.1 Configure Signaling Network Routes

### Procedure 32. Configure the Signaling Network Routes

STEP #	Procedure	Description
<p>This procedure configures signaling network routes on MP-type servers (DA-MP, IPFE, SBR, etc.). Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1. <input type="checkbox"/></p>	<p>Establish GUI session on the NOAM VIP</p>	<p>Establish a GUI session on the NOAM by using the NOAM VIP address. Login as the <b>guiadmin</b> user.</p>  <p>Welcome to the Oracle System Login.</p> <p>This application is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the <a href="#">Oracle Software Web Browser Support Policy</a> for details.</p> <p>Unauthorized access is prohibited.</p> <p>Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.</p> <p>Copyright © 2010, 2016, <a href="#">Oracle</a> and/or its affiliates. All rights reserved.</p>

STEP #	Procedure	Description																
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>NOAM VIP:</b> Navigate to routes configuration screen</p>	<p>1. Navigate to <b>Configuration &gt; Networking &gt; Network &gt; Routes</b>.</p>  <p>2. Select the first MP Server you see listed on the first row of tabs as shown and click the <b>Entire Server Group</b> link. Initially, no routes should display.</p>  <table border="1"> <thead> <tr> <th>Route Type</th> <th>Destination</th> <th>Netmask</th> <th>Gateway</th> <th>Device Name</th> <th>Route Scope</th> <th>Configuration Status</th> <th>Is Locked?</th> </tr> </thead> <tbody> <tr> <td>default</td> <td>0.0.0.0</td> <td></td> <td>10.196.227.1</td> <td>eth0</td> <td>Server</td> <td>Discovered</td> <td>Locked</td> </tr> </tbody> </table>	Route Type	Destination	Netmask	Gateway	Device Name	Route Scope	Configuration Status	Is Locked?	default	0.0.0.0		10.196.227.1	eth0	Server	Discovered	Locked
Route Type	Destination	Netmask	Gateway	Device Name	Route Scope	Configuration Status	Is Locked?											
default	0.0.0.0		10.196.227.1	eth0	Server	Discovered	Locked											
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>NOAM VIP:</b> Add route</p>	<p>Click <b>Insert</b> at the bottom of the screen to add additional routes.</p> 																
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Add default route for MPs going through signaling network gateway (Optional)</p>	<p><b>***OPTIONAL</b> — Only execute this step if you performed Procedure 29, step 14. , that you have deleted default XMI route and plan to replace it with default XSI routes.</p> <p><b>To delete the existing default route:</b></p> <ol style="list-style-type: none"> <li>1. Log into the PRIMARY NOAM VIP GUI.</li> <li>2. Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.</li> <li>3. Select the specific SO tab.</li> <li>4. Select the XMI network and click <b>Unlock</b>. Click <b>OK</b>.</li> <li>5. Navigate to <b>Configuration &gt; Networking &gt; Routes</b>.</li> <li>6. Select the Specific MP XMI route and click <b>Delete</b>.</li> <li>7. Click <b>OK</b>.</li> <li>8. Repeat the above steps for all required MPs to delete the XMI routes.</li> <li>9. Navigate to <b>Configuration &gt; Networking &gt; Networks</b>.</li> <li>10. Select the respective SOAM tab.</li> <li>11. Select the XMI network and click <b>Lock</b>.</li> <li>12. Click <b>OK</b>.</li> </ol> <p>If your MP servers no longer have a default route, then you can insert a default route here, which uses one of the signaling network gateways.</p>																



STEP #	Procedure	Description																		
		<p><b>Insert Route on DAMP1</b></p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Route Type *</td> <td> <input type="radio"/> Net  <input checked="" type="radio"/> Default  <input type="radio"/> Host                 </td> <td>Select a route type. [Default = N/A. Options = Net,</td> </tr> <tr> <td>Device *</td> <td>eth3</td> <td>Select the network device name through which tra [A value is required.]</td> </tr> <tr> <td>Destination</td> <td></td> <td>The destination network address. [Default = N/A. F</td> </tr> <tr> <td>Netmask</td> <td></td> <td>A valid netmask for the network route destination I</td> </tr> <tr> <td>Gateway IP *</td> <td></td> <td>The IP address of the gateway for this route. [Def:</td> </tr> </tbody> </table> <p> <input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/> </p> <p> <b>Route Type:</b> <a href="#">Default</a>  <b>Device:</b> Select the signaling device directly attached to the network where the XSI default gateway resides.  <b>Gateway IP:</b> The XSI gateway you wish to use for default signaling network access.                 </p> <p>13. Click <b>OK</b>.</p>	Field	Value	Description	Route Type *	<input type="radio"/> Net <input checked="" type="radio"/> Default <input type="radio"/> Host	Select a route type. [Default = N/A. Options = Net,	Device *	eth3	Select the network device name through which tra [A value is required.]	Destination		The destination network address. [Default = N/A. F	Netmask		A valid netmask for the network route destination I	Gateway IP *		The IP address of the gateway for this route. [Def:
Field	Value	Description																		
Route Type *	<input type="radio"/> Net <input checked="" type="radio"/> Default <input type="radio"/> Host	Select a route type. [Default = N/A. Options = Net,																		
Device *	eth3	Select the network device name through which tra [A value is required.]																		
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Netmask		A valid netmask for the network route destination I																		
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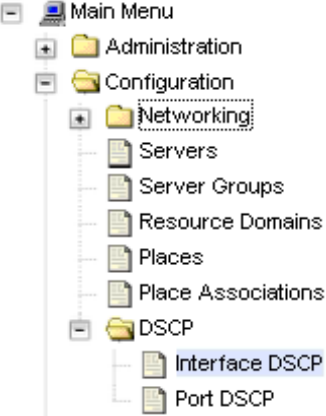


STEP #	Procedure	Description																		
5. <input type="checkbox"/>	<b>Primary NOAM VIP GUI:</b> Add network routes for Diameter peers	<p>1. Use this step to add IP4 and/or IPv6 routes to <b>Diameter</b> peer destination networks. The goal for this step is to ensure Diameter traffic uses the gateway(s) on the signaling networks.</p> <p>Insert Route on BuenosAires-DAMP1</p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Route Type</td> <td> <input checked="" type="radio"/> Net  <input type="radio"/> Default  <input type="radio"/> Host *                 </td> <td>Select a route type. [Default = N/A. Options = Net, Default, Host. You can configure at most one IPV4 default route and one IPV6 default route on a given target machine.]</td> </tr> <tr> <td>Device</td> <td>eth2 *</td> <td>Select the network device name through which traffic is being routed. The selection of AUTO will result in the device being selected automatically, if possible. [Default = N/A. Range = Provisioned devices on the selected server.]</td> </tr> <tr> <td>Destination</td> <td></td> <td>The destination network address. [Default = N/A. Range = Valid Network Address of the network in dotted decimal (IPv4) or colon hex (IPv6) format.]</td> </tr> <tr> <td>Netmask</td> <td></td> <td>A valid netmask for the network route destination IP address. [Default = N/A. Range = Valid Netmask for the network in prefix length (IPv4 or IPv6) or dotted decimal (IPv4) format.]</td> </tr> <tr> <td>Gateway IP</td> <td></td> <td>The IP address of the gateway for this route. [Default = N/A. Range = Valid IP address of the gateway in dotted decimal (IPv4) or colon hex (IPv6) format.]</td> </tr> </tbody> </table> <p style="text-align: center;"><input type="button" value="Ok"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/></p> <p><b>Route Type:</b> Net</p> <p><b>Device:</b> Select the appropriate signaling interface that is used to connect to that network</p> <p><b>Destination:</b> Type the <b>Network ID</b> of network to which the peer node is connected to</p> <p><b>Netmask:</b> Type the corresponding Netmask</p> <p><b>Gateway IP:</b> Type the <b>IP</b> of the customer gateway.</p> <p>2. If you have more routes to enter, click <b>Apply</b> to save the current route entry. Repeat this step to enter more routes.</p> <p>3. If you have finished entering routes, click <b>OK</b> to save the latest route and leave this screen.</p>	Field	Value	Description	Route Type	<input checked="" type="radio"/> Net <input type="radio"/> Default <input type="radio"/> Host *	Select a route type. [Default = N/A. Options = Net, Default, Host. You can configure at most one IPV4 default route and one IPV6 default route on a given target machine.]	Device	eth2 *	Select the network device name through which traffic is being routed. The selection of AUTO will result in the device being selected automatically, if possible. [Default = N/A. Range = Provisioned devices on the selected server.]	Destination		The destination network address. [Default = N/A. Range = Valid Network Address of the network in dotted decimal (IPv4) or colon hex (IPv6) format.]	Netmask		A valid netmask for the network route destination IP address. [Default = N/A. Range = Valid Netmask for the network in prefix length (IPv4 or IPv6) or dotted decimal (IPv4) format.]	Gateway IP		The IP address of the gateway for this route. [Default = N/A. Range = Valid IP address of the gateway in dotted decimal (IPv4) or colon hex (IPv6) format.]
Field	Value	Description																		
Route Type	<input checked="" type="radio"/> Net <input type="radio"/> Default <input type="radio"/> Host *	Select a route type. [Default = N/A. Options = Net, Default, Host. You can configure at most one IPV4 default route and one IPV6 default route on a given target machine.]																		
Device	eth2 *	Select the network device name through which traffic is being routed. The selection of AUTO will result in the device being selected automatically, if possible. [Default = N/A. Range = Provisioned devices on the selected server.]																		
Destination		The destination network address. [Default = N/A. Range = Valid Network Address of the network in dotted decimal (IPv4) or colon hex (IPv6) format.]																		
Netmask		A valid netmask for the network route destination IP address. [Default = N/A. Range = Valid Netmask for the network in prefix length (IPv4 or IPv6) or dotted decimal (IPv4) format.]																		
Gateway IP		The IP address of the gateway for this route. [Default = N/A. Range = Valid IP address of the gateway in dotted decimal (IPv4) or colon hex (IPv6) format.]																		
6. <input type="checkbox"/>	Repeat steps 2-5 for all other MP server groups	The routes entered in this procedure should now be configured on <b>all</b> MPs in the server group for the first MP you selected. If you have additional MP server groups, repeat from step 2 but this time, select an MP from the next MP server group. Continue until you have covered all MP server groups.																		


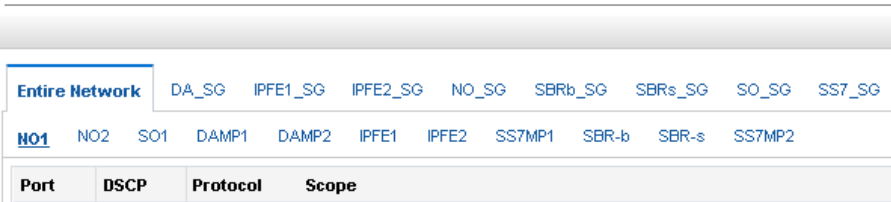
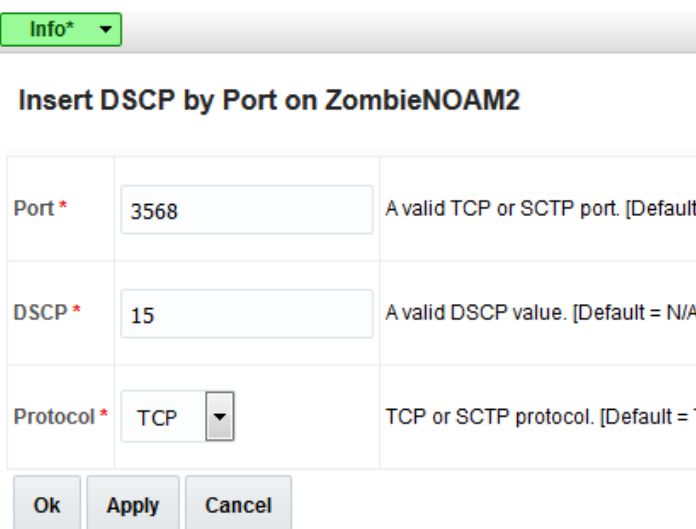
## 5.2 Configure DSCP (Optional)

### Procedure 33. Configure DSCP Values for Outgoing Traffic (Optional)

STEP #	Procedure	Description
		<p>This procedure configures the DSCP values for outgoing packets on servers. DSCP values can be applied to an outbound interface as a whole, or to all outbound traffic using a specific TCP or SCTP source port. This step is optional and should only be executed if has been decided that your network uses packet DSCP markings for Quality-of-Service purposes.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

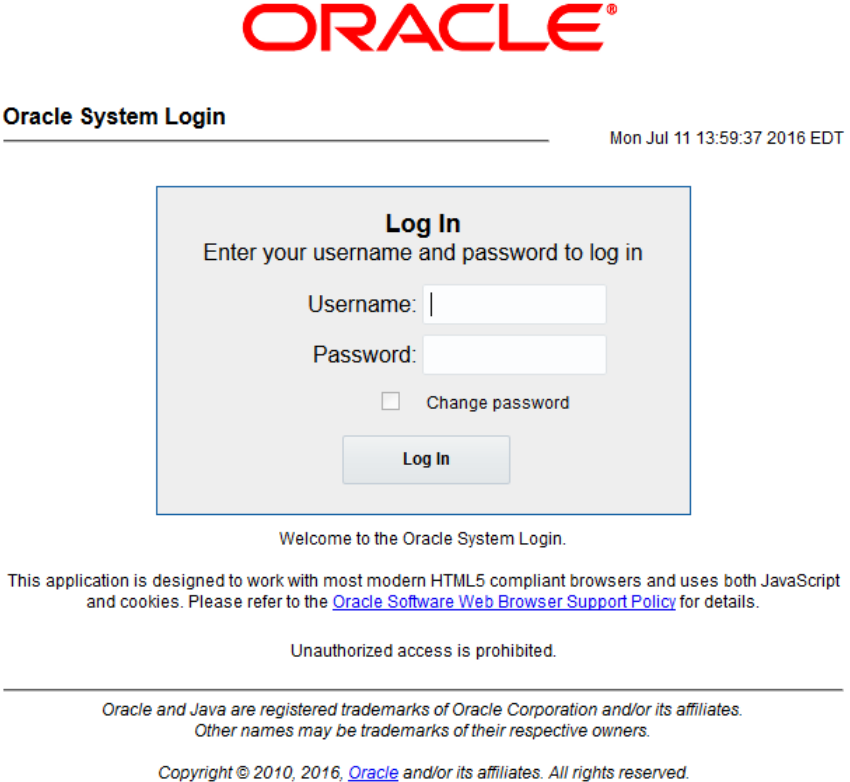
STEP #	Procedure	Description
<p>1. <input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Establish GUI session on the NOAM VIP</p>	<p>Establish a GUI session on the NOAM by using the NOAM VIP address. Login as the <b>guiadmin</b> user.</p>  <p>Welcome to the Oracle System Login.</p> <p>This application is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the <a href="#">Oracle Software Web Browser Support Policy</a> for details.</p> <p>Unauthorized access is prohibited.</p> <hr/> <p><i>Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.</i></p> <p><i>Copyright © 2010, 2016, <a href="#">Oracle</a> and/or its affiliates. All rights reserved.</i></p>

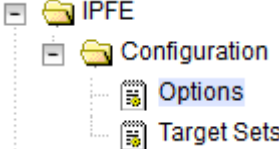
STEP #	Procedure	Description
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Option 1: Configure interface DSCP</p>	<p><b>Note:</b> The values displayed in the screenshots are for demonstration purposes only. The exact DSCP values for your site will vary.</p> <ol style="list-style-type: none"> <li>1. Navigate to <b>Configuration &gt; Networking&gt;DSCP &gt; Interface DSCP</b>.</li> </ol>  <ol style="list-style-type: none"> <li>2. Select the server to configure from the list of servers on the 2<sup>nd</sup> line. You can view all servers with <b>Entire Network</b> selected; or limit yourself to a particular server group by clicking on the server group name's tab.</li> <li>3. Click <b>Insert</b>.</li> </ol>  <ol style="list-style-type: none"> <li>4. Select the network <b>Interface</b> from the list, and type the <b>DSCP</b> value to apply to packets leaving this interface.</li> </ol>  <ol style="list-style-type: none"> <li>5. Click <b>OK</b> if there are no more interfaces on this server to configure, or <b>Apply</b> to finish this interface and continue with more interfaces by selecting them from the list and typing their <b>DSCP</b> values.</li> </ol>

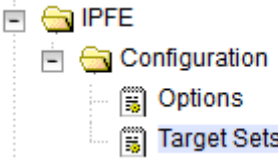
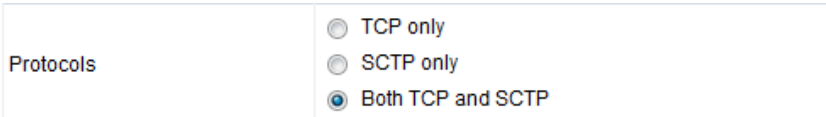


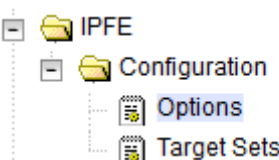
STEP #	Procedure	Description
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>Primary NOAM VIP GUI:</b> Option 2: Configure port DSCP</p>	<p><b>Note:</b> The values displayed in the screenshots are for demonstration purposes only. The exact DSCP values for your site will vary.</p> <ol style="list-style-type: none"> <li>1. Navigate to <b>Configuration &gt; Networking &gt; DSCP &gt; Port DSCP</b>.</li> </ol>  <ol style="list-style-type: none"> <li>2. Select the server to configure from the list of servers on the 2<sup>nd</sup> line. You can view all servers with <b>Entire Network</b> selected; or limit yourself to a particular server group by clicking on the server group name's tab.</li> <li>3. Click <b>Insert</b>.</li> </ol> <p>Main Menu: Configuration -&gt; DSCP -&gt; Port DSCP</p>  <ol style="list-style-type: none"> <li>4. Type the source <b>Port</b> and <b>DSCP</b> value, and select the transport <b>Protocol</b>.</li> </ol> <p>Main Menu: Configuration -&gt; DSCP -&gt; Port DSCP</p>  <ol style="list-style-type: none"> <li>5. Click <b>OK</b> if there are no more port DSCPs on this server to configure, or <b>Apply</b> to finish this port entry and continue entering more port <b>DSCP mappings</b>.</li> </ol>
<p>4.</p> <p><input type="checkbox"/></p>	<p>Repeat for additional servers</p>	<p>Repeat steps 2-3 for all remaining servers.</p>

### 5.3 Configure IP Front End (Optional)

#### Procedure 34. IP Front End (IPFE) Configuration

STEP #	Procedure	Description
<p>This procedure configures IP Front End (IPFE) and optimizes performance. Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1. <input type="checkbox"/></p>	<p><b>SOAM VIP: Login</b></p>	<p>Log into the <b>SOAM VIP</b> GUI as the <b>guidadmin</b> user.</p> 

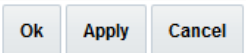
STEP #	Procedure	Description																		
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>SOAM VIP:</b> Configuration of replication IPFE association data</p>	<p>1. Navigate to <b>IPFE &gt; Configuration &gt; Options</b>.</p>  <p>2. Type the IP address of the <b>1<sup>st</sup> IPFE</b> in the <b>IPFE-A1 IP Address</b> field and the IP address of the <b>2<sup>nd</sup> IPFE</b> in the <b>IPFE-A2 IP Address</b> field.</p> <p>3. If applicable, type the address of the <b>3<sup>d</sup></b> and <b>4<sup>th</sup></b> IPFE servers in <b>IPFE-B1 IP Address</b> and <b>IPFE-B2 IP Address</b> fields.</p> <table border="1"> <thead> <tr> <th>Variable</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td colspan="3"><b>Inter-IPFE Synchronization</b></td> </tr> <tr> <td>IPFE-A1 IP Address</td> <td>169.254.1.26 - IPFE1</td> <td>IPv4 or IPv6 address of IPFE-A1. This selection is disabled when a Target Set has IPFE-A1 selected as Active.</td> </tr> <tr> <td>IPFE-A2 IP Address</td> <td>169.254.1.27 - IPFE2</td> <td>IPv4 or IPv6 address of IPFE-A2. This selection is disabled when a Target Set has IPFE-A2 selected as Active.</td> </tr> <tr> <td>IPFE-B1 IP Address</td> <td>&lt;unset&gt;</td> <td>IPv4 or IPv6 address of IPFE-B1. This selection is disabled when a Target Set has IPFE-B1 selected as Active.</td> </tr> <tr> <td>IPFE-B2 IP Address</td> <td>&lt;unset&gt;</td> <td>IPv4 or IPv6 address of IPFE-B2. This selection is disabled when a Target Set has IPFE-B2 selected as Active.</td> </tr> </tbody> </table> <p><b>Note:</b> It is recommended the address reside on the <b>IMI (Internal Management Interface)</b> network.</p> <p><b>Note:</b> <b>IPFE-A1</b> and <b>IPFE-A2</b> must have connectivity between each other using these addresses. The same applies with <b>IPFE-B1</b> and <b>IPFE-B2</b>.</p>	Variable	Value	Description	<b>Inter-IPFE Synchronization</b>			IPFE-A1 IP Address	169.254.1.26 - IPFE1	IPv4 or IPv6 address of IPFE-A1. This selection is disabled when a Target Set has IPFE-A1 selected as Active.	IPFE-A2 IP Address	169.254.1.27 - IPFE2	IPv4 or IPv6 address of IPFE-A2. This selection is disabled when a Target Set has IPFE-A2 selected as Active.	IPFE-B1 IP Address	<unset>	IPv4 or IPv6 address of IPFE-B1. This selection is disabled when a Target Set has IPFE-B1 selected as Active.	IPFE-B2 IP Address	<unset>	IPv4 or IPv6 address of IPFE-B2. This selection is disabled when a Target Set has IPFE-B2 selected as Active.
Variable	Value	Description																		
<b>Inter-IPFE Synchronization</b>																				
IPFE-A1 IP Address	169.254.1.26 - IPFE1	IPv4 or IPv6 address of IPFE-A1. This selection is disabled when a Target Set has IPFE-A1 selected as Active.																		
IPFE-A2 IP Address	169.254.1.27 - IPFE2	IPv4 or IPv6 address of IPFE-A2. This selection is disabled when a Target Set has IPFE-A2 selected as Active.																		
IPFE-B1 IP Address	<unset>	IPv4 or IPv6 address of IPFE-B1. This selection is disabled when a Target Set has IPFE-B1 selected as Active.																		
IPFE-B2 IP Address	<unset>	IPv4 or IPv6 address of IPFE-B2. This selection is disabled when a Target Set has IPFE-B2 selected as Active.																		

STEP #	Procedure	Description
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>SOAM VIP:</b> Configuration of IPFE target sets (Part 1)</p>	<ol style="list-style-type: none"> <li>Log into the <b>SOAM VIP</b> GUI as the <b>guiadmin</b> user.</li> <li>Navigate to <b>IPFE &gt; Configuration &gt; Target Sets</b>.                     <div style="margin-left: 20px;">  </div> </li> <li>Click either <b>Insert IPv4</b> or <b>Insert IPv6</b> depending on the IP version of the target set you plan to use.                     <p>This screen displays the following configurable settings:</p> <p><b>Protocols:</b> Protocols the target set supports.</p> <div style="margin-left: 20px;">  </div> <p><b>Delete Age:</b> Specifies when the IPFE should remove its association data for a connection. Any packets presenting a source IP address/port combination that had been previously stored as association state but have been idle longer than the <b>Delete Age</b> configuration is treated as a new connection and does not automatically go to the same application server.</p> <div style="margin-left: 20px;">  </div> <p><b>Load Balance Algorithm:</b> Hash or Least Load options.</p> <div style="margin-left: 20px;">  </div> <p><b>Note:</b> For the IPFE to provide Least Load distribution, navigate to <b>IPFE &gt; Configuration &gt; Options</b>, Monitoring Protocol must be set to Heartbeat so the application servers can provide the load information the IPFE uses to select the least-loaded server for connections.</p> <div style="margin-left: 20px;">  </div> <p><b>Note:</b> The Least Load option is the default setting, and is the recommended option with exception of unique backward compatibility scenarios.</p> </li> </ol>
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>SOAM VIP:</b> Configuration of IPFE target sets (Part 2)</p>	<ol style="list-style-type: none"> <li>Navigate to <b>IPFE &gt; Configuration &gt; Target Sets</b>.</li> </ol>



STEP #	Procedure	Description
		<div> </div> <p><b>(Optional):</b> If you have selected the <b>Least Load</b> algorithm, then you may configure the following fields to adjust the algorithm's behavior:</p> <p><b>MPS Factor:</b> Messages per Second (MPS) is one component of the least load algorithm. This field allows you to set it from 0 (not used in load calculations) to 100 (the only component used for load calculations). It is recommended that IPFE connections have Reserved Ingress MPS set to something other than the default, which is 0. To configure <b>Reserved Ingress MPS</b>, navigate to <b>Main Menu &gt; Diameter &gt; Configuration &gt; Configuration Sets &gt; Capacity Configuration</b>. If you choose not to use <b>Reserved Ingress MPS</b>, set <b>MPS Factor</b> to 0, and <b>Connection Count Factor</b>, described below, to 100.</p> <p><b>Connection Count Factor:</b> This is the other component of the <b>least load</b> algorithm. This field allows you to set it from 0 (not used in load calculations) to 100 (the only component used for load calculations). Increase this setting if connection storms (the arrival of many connections at a very rapid rate) are a concern.</p> <div> <p>MPS Factor * <input type="text" value="50"/></p> </div> <div> <p>Connection Count Factor * <input type="text" value="50"/></p> </div> <p><b>Allowed Deviation:</b> Percentage within which two application server's load calculation results are considered to be equal. If very short, intense connection bursts are expected to occur, increase the value to smooth out the distribution.</p> <div> <p>Allowed Deviation * <input type="text" value="5"/></p> </div> <p><b>Primary Public IP Address:</b> IP address for the target set.</p> <div> <p><b>Public IP Address</b></p> <p>Address * <input type="text"/></p> <p>Active IPFE</p> <p><input checked="" type="radio"/> IPFE A1 ..... <input type="radio"/> IPFE A2</p> <p><input type="radio"/> IPFE B1 ..... <input type="radio"/> IPFE B2</p> </div> <p><b>Note:</b> This address must reside on the XSI (External Signaling Interface) network because it is used by the application clients to reach the</p>

STEP #	Procedure	Description								
		<p>application servers. This address <b>MUST NOT</b> be a real interface address (that is, must not be associated with a network interface card).</p> <p><b>Active IPFE:</b> IPFE to handle the traffic for the target set address.</p> <p><b>Secondary Public IP Address:</b> If this target set supports either multi-homed SCTP or Both TCP and SCTP, provide a Secondary IP Address.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p><b>Alternate Public IP Address<sup>†</sup></b></p> <p>Alternate Address <input type="text"/></p> <hr/> <p>Active IPFE for alternate address</p> <p> <input checked="" type="radio"/> IPFE A1 ----- IPFE A2 <input type="radio"/>  <input type="radio"/> IPFE B1 ----- IPFE B2 <input type="radio"/> </p> </div> <p><b>Note:</b> A secondary address is required to support SCTP multi-homing. A secondary address can support TCP, but the TCP connections are not multi-homed.</p> <p><b>Note:</b> If SCTP multi-homing is to be supported, select the mate IPFE of the Active IPFE for the Active IPFE for secondary address to ensure SCTP failover functions as designed.</p> <p><b>Target Set IP List:</b> Select an IP address, a secondary IP address if supporting <b>SCTP multi-homing</b>, a description, and a weight for the application server.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p><b>Target Set IP List</b></p> <table border="1"> <thead> <tr> <th>IP Address</th> <th>Alternate IP Address</th> <th>Description</th> <th>Weighting</th> </tr> </thead> <tbody> <tr> <td>01 - Select -</td> <td>- Select -</td> <td></td> <td>100 X</td> </tr> </tbody> </table> <p>Add <span style="float: right;">Weighting range is 0 - 65535.</span></p> </div> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>The IP address must be on the XSI network since they must be on the same network as the target set address. This address must also match the IP version of the target set address (IPv4 or IPv6). If the Secondary Public IP Address is configured, it must reside on the same application server as the first IP address.</li> <li>A port must be created to associate the IP that needs to be used as TSA IP in cloud. Create a port using the following command:  <pre>neutron port-create &lt;xsi network-id&gt;</pre>                     The command results in an IP that can be used as TSA IP.</li> </ul> <p><b>Note:</b> If all application servers have an equal weight (for example, 100, which is the default), they have an equal chance of being selected. Application servers with larger weights have a greater chance of being selected.</p> <p>2. Click <b>Add</b> to add more application servers (up to 16).</p>	IP Address	Alternate IP Address	Description	Weighting	01 - Select -	- Select -		100 X
IP Address	Alternate IP Address	Description	Weighting							
01 - Select -	- Select -		100 X							

STEP #	Procedure	Description
		3. Click <b>Apply</b> . 
5. <input type="checkbox"/>	<b>SOAM VIP:</b> Repeat for additional configuration of IPFE target sets	Repeat for steps 3 and 4 for each target set (up to 16). At least one target set must be configured.

### 5.4 Configure the Desired MTU value

By default DSR defines MTU size of all its management and/or signaling networks as 1500 bytes. If the configured virtual network(s) on cloud is VXLAN based and MTU size defined/negotiated on it is 1500 bytes, then we need to accommodate VXLAN header (size 65 bytes) within these 1500 bytes.

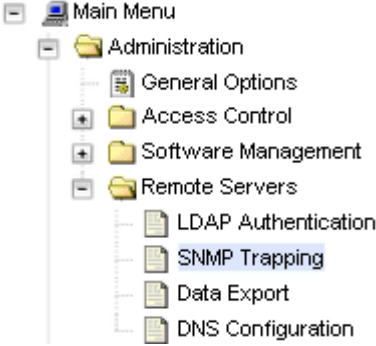
STEP #	Procedure	Description
<p>This procedure configures the desired MTU value.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <p><input type="checkbox"/></p>	<p>Verify the MTU on DSR system</p>	<p>Verify the MTU on DSR system, by executing:</p> <pre>iqt -pE NetworkDeviceOption</pre> <p>Sample output:</p> <pre>DeviceOption_ID=0 Keyword=MTU Device_ID=0 Value=1500 DeviceOption_ID=1 Keyword=bootProto Device_ID=0 Value=none DeviceOption_ID=2 Keyword=onboot Device_ID=0 Value=yes DeviceOption_ID=3 Keyword=MTU Device_ID=1 Value=1500 DeviceOption_ID=4 Keyword=bootProto Device_ID=1 Value=none DeviceOption_ID=5 Keyword=onboot Device_ID=1 Value=yes DeviceOption_ID=6 Keyword=MTU Device_ID=2 Value=1500 DeviceOption_ID=7 Keyword=bootProto Device_ID=2 Value=none DeviceOption_ID=8 Keyword=onboot Device_ID=2 Value=yes DeviceOption_ID=9 Keyword=MTU Device_ID=3 Value=1500 DeviceOption_ID=10 Keyword=bootProto Device_ID=3 Value=none DeviceOption_ID=11 Keyword=onboot Device_ID=3 Value=yes DeviceOption_ID=12 Keyword=MTU Device_ID=4 Value=1500 DeviceOption_ID=13 Keyword=bootProto Device_ID=4 Value=none DeviceOption_ID=14 Keyword=onboot Device_ID=4 Value=yes</pre>
<p>2.</p> <p><input type="checkbox"/></p>	<p>Change the MTU value on DSR system (Optional)</p>	<p>If the MTU value is 1500 bytes, change it to 1435 bytes, by executing:</p> <pre>sudo iset -fValue=1435 NetworkDeviceOption where "Keyword='MTU'"</pre> <p>=== changed 256 records ===</p> <p>Wait for few minutes.</p>

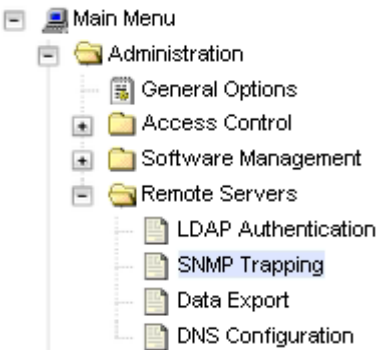

<p>3.</p>	<p>Verify the MTU value</p>	<p>Verify the MTU value on DSR system by executing:</p> <pre>ip addr</pre> <p>Sample output:</p> <pre>1: lo: &lt;LOOPBACK,UP,LOWER_UP&gt; mtu 65536 qdisc noqueue state UNKNOWN link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00 inet 127.0.0.1/8 scope host lo inet6 ::1/128 scope host valid_lft forever preferred_lft forever 2: control: &lt;BROADCAST,MULTICAST,UP,LOWER_UP&gt; mtu 1450 qdisc pfifo_fast state UP qlen 1000 link/ether 02:79:b5:f7:65:0e brd ff:ff:ff:ff:ff:ff inet 192.168.1.32/24 brd 192.168.1.255 scope global control inet6 fe80::79:b5ff:fe7:650e/64 scope link valid_lft forever preferred_lft forever 3: xmi: &lt;BROADCAST,MULTICAST,UP,LOWER_UP&gt; mtu 1435 qdisc pfifo_fast state UP qlen 1000 link/ether 02:90:04:c6:3b:e1 brd ff:ff:ff:ff:ff:ff inet 10.75.198.37/25 brd 10.75.198.127 scope global xmi inet 10.75.198.4/25 scope global secondary xmi inet6 2606:b400:605:b821:90:4ff:fec6:3be1/64 scope global dynamic valid_lft 2591870sec preferred_lft 604670sec inet6 fe80::90:4ff:fec6:3be1/64 scope link valid_lft forever preferred_lft forever 4: imi: &lt;BROADCAST,MULTICAST,UP,LOWER_UP&gt; mtu 1435 qdisc pfifo_fast state UP qlen 1000 link/ether 02:3b:48:96:3c:61 brd ff:ff:ff:ff:ff:ff inet 192.168.100.32/24 brd 192.168.100.255 scope global imi inet6 fe80::3b:48ff:fe96:3c61/64 scope link valid_lft forever preferred_lft forever</pre> <p>Verify on all nodes:</p> <pre>iqt -pE NetworkDeviceOption</pre> <p>Sample output:</p> <pre>DeviceOption_ID=0 Keyword=MTU Device_ID=0 Value=1435 DeviceOption_ID=1 Keyword=bootProto Device_ID=0 Value=none DeviceOption_ID=2 Keyword=onboot Device_ID=0 Value=yes DeviceOption_ID=3 Keyword=MTU Device_ID=1 Value=1435 DeviceOption_ID=4 Keyword=bootProto Device_ID=1 Value=none DeviceOption_ID=5 Keyword=onboot Device_ID=1 Value=yes DeviceOption_ID=6 Keyword=MTU Device_ID=2 Value=1435 DeviceOption_ID=7 Keyword=bootProto Device_ID=2 Value=none DeviceOption_ID=8 Keyword=onboot Device_ID=2 Value=yes DeviceOption_ID=9 Keyword=MTU Device_ID=3 Value=1435 DeviceOption_ID=10 Keyword=bootProto Device_ID=3 Value=none DeviceOption_ID=11 Keyword=onboot Device_ID=3 Value=yes DeviceOption_ID=12 Keyword=MTU Device_ID=4 Value=1435 DeviceOption_ID=13 Keyword=bootProto Device_ID=4 Value=none DeviceOption_ID=14 Keyword=onboot Device_ID=4 Value=yes</pre>
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### 5.5 SNMP Configuration (Optional)

#### Procedure 35. Configure SNMP Trap Receiver(s) (Optional)

STEP #	Procedure	Description
		This procedure configures forwarding of SNMP.

STEP #	Procedure	Description
<p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>4. <input type="checkbox"/></p>	<p><b>NOAM VIP:</b> Configure system-wide SNMP trap receiver(s)</p>	<ol style="list-style-type: none"> <li>Using a web browser, log into the NOAM VIP as the <b>guiadmin</b> user. Navigate to <b>Administration &gt; SNMP</b>.</li> </ol>  <ol style="list-style-type: none"> <li>Click <b>Insert</b>.</li> <li>Type the <b>IP address</b> or <b>Hostname</b> of the Network Management Station (NMS) to forward traps to. This IP should be reachable from the NOAM's <b>XMI</b> network.</li> <li>Continue to add secondary manager IPs in the corresponding fields, if needed.</li> </ol> <p><b>Manager 1</b> <input type="text"/></p> <p><b>Traps Enabled</b> checkboxes can be marked on a per manager basis.</p> <p><b>Traps Enabled</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Manager 1</li> <li><input type="checkbox"/> Manager 2</li> <li><input type="checkbox"/> Manager 3</li> <li><input type="checkbox"/> Manager 4</li> <li><input type="checkbox"/> Manager 5</li> </ul> <p>Type the <b>SNMP Community Name</b>.</p> <p><b>SNMPv2c Read-Only Community Name</b> <input type="text" value="....."/></p> <p><b>SNMPv2c Read-Write Community Name</b> <input type="text"/></p> <ol style="list-style-type: none"> <li>Leave all other fields with their default values.</li> <li>Click <b>OK</b>.</li> </ol>
<p>5. <input type="checkbox"/></p>	<p><b>NOAM VIP:</b> Enable traps from individual servers (Optional)</p>	<p><b>Note:</b> By default, SNMP traps from MPs are aggregated and displayed at the active NOAM. If instead, you want every server to send its own traps directly to the NMS, then execute this procedure.</p> <p>This procedure requires all servers, including MPs, have an XMI interface on which the customer SNMP Target server (NMS) is reachable.</p>

STEP #	Procedure	Description
		<p>1. Using a web browser, log into the NOAM VIP as the <b>guiadmin</b> user. Navigate to <b>Administration &gt; SNMP</b>.</p>  <p>2. Make sure the <b>Enabled</b> checkbox is marked, if not, mark it as shown below:</p>  <p>3. Click <b>Apply</b> and verify the data is committed.</p>

## 5.6 Create iDIH Virtual Machines - VMware (Optional)

### Procedure 36. (VMware only) Create iDIH Oracle, Mediation, and Application VMs (Optional)

STEP #	Procedure	Description
<p>This procedure creates the iDIH Oracle, Mediation, and Application guest.</p> <p><b>Needed material:</b> iDIH Oracle OVA, iDIH Mediation OVA, and iDIH Application OVA.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <input type="checkbox"/>	<p>Add the iDIH Oracle OVA to VMware</p>	<p>1. Launch the VMware client of your choice.</p> <p>2. Add the <b>iDIH Oracle OVA</b> image to the VMware catalog or repository. Follow the instructions provided by the Cloud solutions manufacturer.</p>
<p>2.</p> <input type="checkbox"/>	<p>Create the Oracle VM from the OVA image</p>	<p>1. Browse the library or repository that you placed the <b>iDIH Oracle OVA</b> image.</p> <p>2. Deploy the OVA Image using vSphere Client or the vSphere Web Client.</p> <p>3. Name the <b>iDIH Oracle VM</b> and select the data store.</p>

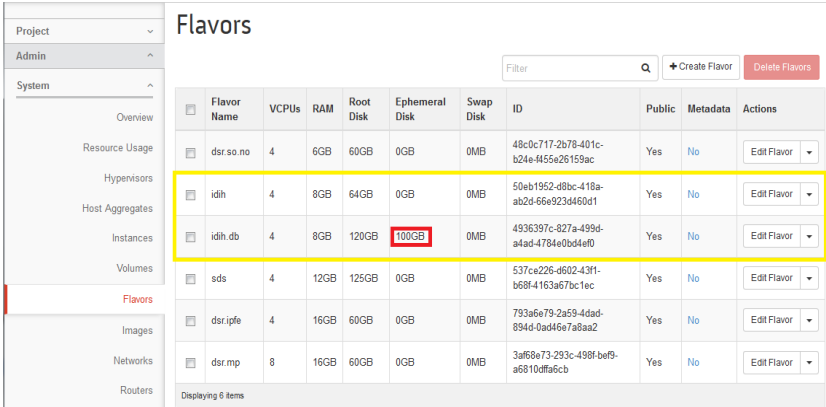
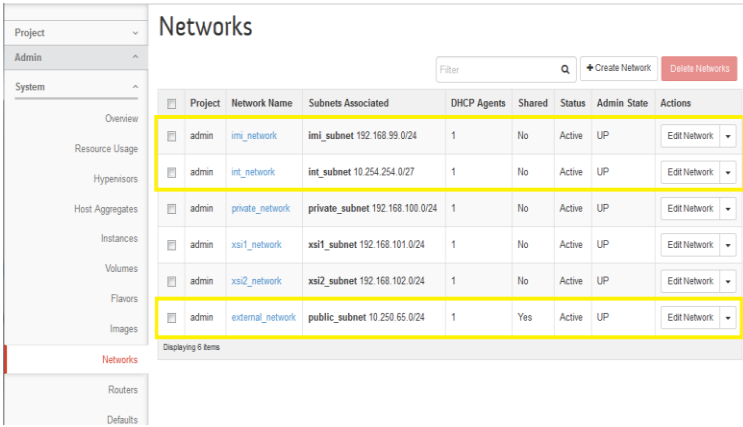
STEP #	Procedure	Description
<input type="checkbox"/> 3.	Configure resources for the iDIH Oracle VM	1. Configure the <b>iDIH Oracle VM</b> per the resource profiles defined in [24] DSR Cloud Benchmarking Guide using the vSphere client or the vSphere web client. 2. Record the Ethernet addresses associated with each interface and the virtual network with which it is associated.  <b>Note:</b> Make sure the order of the interface creation is XMI, INT, and then IMI, if there is any. Only the Mediation VM requires the IMI interface.
<input type="checkbox"/> 4.	iDIH Oracle VM Only: Create a raw storage block device (external device)	<b>Note:</b> This step is <b>ONLY</b> required for iDIH Oracle VM. Create an extra disk for the Oracle VM. Add the second disk using the vSphere client or the vSphere web client.
<input type="checkbox"/> 5.	Power on the iDIH Oracle VM	Use the <b>vSphere client</b> or <b>vSphere web client</b> to power on the <b>iDIH Oracle VM</b> .
<input type="checkbox"/> 6.	iDIH Oracle VM Only: Verify the extra/second disk exists	<b>Note:</b> This step is <b>ONLY</b> required for iDIH Oracle VM. Check if the raw storage block device (external disk) added in step 3 exists by executing any of these commands: <pre>\$ ls /dev/[sv]db \$ fdisk -l \$ df -h</pre> <b>Note:</b> Please DO NOT mount or format the added raw block device. Oracle ASM (Automatic Storage Management) automatically manages it. If you see it has been mounted, unmount it and make sure to completely <b>remove the entry in the /etc/fstab.</b>
<input type="checkbox"/> 7.	Repeat	Repeat steps 1 through 6 for the following VMs. Use unique labels for the VM names: iDIH Application iDIH Mediation



## 5.7 Create iDIH Virtual Machines - KVM/OpenStack (Optional)

### Procedure 37. (KVM/OpenStack Only) Create iDIH Oracle, Mediation, and Application VMs (Optional)

STEP #	Procedure	Description
<p>This procedure creates the iDIH Oracle, Mediation, and Application guest.</p> <p><b>Needed material:</b> iDIH Oracle OVA, iDIH Mediation OVA, and iDIH Application OVA</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <p><input type="checkbox"/></p>	<p>Add the iDIH Oracle OVA to KVM/Open Stack</p>	<ol style="list-style-type: none"> <li>Copy the OVA file to the OpenStack control node.                     <pre>\$ scp oracle-8.5.x.x.x.ova admusr@node:~</pre> </li> <li>Log into the OpenStack control node.                     <pre>\$ ssh admusr@node</pre> </li> <li>In an empty directory, unpack the OVA file using <b>tar</b>.                     <pre>\$ tar xvf oracle-8.5.x.x.x.ova</pre> </li> <li>One of the unpacked files has a <b>.vmdk</b> suffix. This is the VM image file that must be imported.                     <pre>oracle-8.5.x.x-disk1.vmdk</pre> <p><b>Note:</b> The OVA format only supports files with a max size of 8GB, so a vmdk file larger than that is split. You should be able to concatenate the files together to merge them back into one file:</p> <pre>\$ cat ORA-80_x_x.vmdk.000000000 ORA-80_x_x.vmdk.000000001 &gt; ORA-80_x_x.vmdk</pre> </li> <li>Source the OpenStack <b>admin</b> user credentials.                     <pre>\$ . keystone_admin</pre> </li> <li>Select an informative name for the new image.                     <pre>ORA-8.5_x_x</pre> </li> <li>Import the image using the <b>glance</b> utility from the command line.                     <pre>\$ glance image-create --name oracle-8.5.x.x.x-original --visibility public --protected false --progress --container-format bare --disk-format vmdk --file oracle-8.5.x.x.x-disk1.vmdk</pre> <p>This process takes about 5 minutes depending on the underlying infrastructure.</p> </li> <li>(Optional – Steps 8 and 9 are not needed if VMDK is used.) Convert VMDK to QCOW2 format.                     <p>Use the <code>qemu-img</code> tool to create a qcow2 image file using this command.</p> <pre>qemu-img convert -f vmdk -O qcow2 &lt;VMDK filename&gt; &lt;QCOW2 filename&gt;</pre> <p>For example:</p> <pre>qemu-img convert -f vmdk -O qcow2 DSR-82_12_0.vmdk DSR-82_12_0.qcow2</pre> </li> </ol>

STEP #	Procedure	Description																																																																						
		<p>Install the qemu-img tool (if not already installed) using this yum command.</p> <pre>sudo yum install qemu-img</pre> <p>9. Import the converted qcow2 image using the <b>glance</b> utility from the command line.</p> <pre>\$ glance image-create --name dsr-x.x.x-original --is-public True --is-protected False --progress --container-format bare --disk-format qcow2 --file DSR-x.x.x-disk1.qcow2</pre> <p>This process take about 5 minutes depending on the underlying infrastructure.</p>																																																																						
<p>2.</p> <p><input type="checkbox"/></p>	<p>Create flavors for iDIH</p>	<p>Examine the storage recommendations in the resource profiles defined in [24] DSR Cloud Benchmarking Guide. A block storage must be created and attached for the Oracle VM. For example, create an idih.db for the Oracle database with a 100GB ephemeral disk.</p>  <table border="1"> <caption>Flavors</caption> <thead> <tr> <th>Flavor Name</th> <th>VCPUs</th> <th>RAM</th> <th>Root Disk</th> <th>Ephemeral Disk</th> <th>Swap Disk</th> <th>ID</th> <th>Public</th> <th>Metadata</th> <th>Actions</th> </tr> </thead> <tbody> <tr> <td>dsr.so.no</td> <td>4</td> <td>6GB</td> <td>60GB</td> <td>0GB</td> <td>0MB</td> <td>48c0c717-2b78-401c-b24e-4455a26159ac</td> <td>Yes</td> <td>No</td> <td>Edit Flavor</td> </tr> <tr style="border: 2px solid yellow;"> <td>idih</td> <td>4</td> <td>8GB</td> <td>64GB</td> <td>0GB</td> <td>0MB</td> <td>50eb1952-d8bc-418a-ab2d-66e923d460d1</td> <td>Yes</td> <td>No</td> <td>Edit Flavor</td> </tr> <tr style="border: 2px solid yellow;"> <td>idih.db</td> <td>4</td> <td>8GB</td> <td>120GB</td> <td>100GB</td> <td>0MB</td> <td>4936397c-827a-499d-a4ad-4784e0bd4ef0</td> <td>Yes</td> <td>No</td> <td>Edit Flavor</td> </tr> <tr> <td>sds</td> <td>4</td> <td>12GB</td> <td>125GB</td> <td>0GB</td> <td>0MB</td> <td>537ce226-4602-43f1-b68f4163a67bc1ec</td> <td>Yes</td> <td>No</td> <td>Edit Flavor</td> </tr> <tr> <td>dsr.ipfe</td> <td>4</td> <td>16GB</td> <td>60GB</td> <td>0GB</td> <td>0MB</td> <td>793a6e79-2a59-4dad-894d-0ad46e7a8aa2</td> <td>Yes</td> <td>No</td> <td>Edit Flavor</td> </tr> <tr> <td>dsr.mp</td> <td>8</td> <td>16GB</td> <td>60GB</td> <td>0GB</td> <td>0MB</td> <td>3af69e73-293c-498f-bef9-a6810dffa5c-b</td> <td>Yes</td> <td>No</td> <td>Edit Flavor</td> </tr> </tbody> </table>	Flavor Name	VCPUs	RAM	Root Disk	Ephemeral Disk	Swap Disk	ID	Public	Metadata	Actions	dsr.so.no	4	6GB	60GB	0GB	0MB	48c0c717-2b78-401c-b24e-4455a26159ac	Yes	No	Edit Flavor	idih	4	8GB	64GB	0GB	0MB	50eb1952-d8bc-418a-ab2d-66e923d460d1	Yes	No	Edit Flavor	idih.db	4	8GB	120GB	100GB	0MB	4936397c-827a-499d-a4ad-4784e0bd4ef0	Yes	No	Edit Flavor	sds	4	12GB	125GB	0GB	0MB	537ce226-4602-43f1-b68f4163a67bc1ec	Yes	No	Edit Flavor	dsr.ipfe	4	16GB	60GB	0GB	0MB	793a6e79-2a59-4dad-894d-0ad46e7a8aa2	Yes	No	Edit Flavor	dsr.mp	8	16GB	60GB	0GB	0MB	3af69e73-293c-498f-bef9-a6810dffa5c-b	Yes	No	Edit Flavor
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<p>3.</p> <p><input type="checkbox"/></p>	<p>Create network interfaces</p>	<p>Examine the network interface recommendations defined in [24] DSR Cloud Benchmarking Guide. Network ports must be created for each recommended interface. For example:</p>  <table border="1"> <caption>Networks</caption> <thead> <tr> <th>Project</th> <th>Network Name</th> <th>Subnets Associated</th> <th>DHCP Agents</th> <th>Shared</th> <th>Status</th> <th>Admin State</th> <th>Actions</th> </tr> </thead> <tbody> <tr style="border: 2px solid yellow;"> <td>admin</td> <td>im_network</td> <td>imi_subnet 192.168.99.0/24</td> <td>1</td> <td>No</td> <td>Active</td> <td>UP</td> <td>Edit Network</td> </tr> <tr style="border: 2px solid yellow;"> <td>admin</td> <td>int_network</td> <td>int_subnet 10.254.254.0/27</td> <td>1</td> <td>No</td> <td>Active</td> <td>UP</td> <td>Edit Network</td> </tr> <tr> <td>admin</td> <td>private_network</td> <td>private_subnet 192.168.100.0/24</td> <td>1</td> <td>No</td> <td>Active</td> <td>UP</td> <td>Edit Network</td> </tr> <tr> <td>admin</td> <td>xs1_network</td> <td>xs1_subnet 192.168.101.0/24</td> <td>1</td> <td>No</td> <td>Active</td> <td>UP</td> <td>Edit Network</td> </tr> <tr> <td>admin</td> <td>xs2_network</td> <td>xs2_subnet 192.168.102.0/24</td> <td>1</td> <td>No</td> <td>Active</td> <td>UP</td> <td>Edit Network</td> </tr> <tr style="border: 2px solid yellow;"> <td>admin</td> <td>external_network</td> <td>public_subnet 10.250.65.0/24</td> <td>1</td> <td>Yes</td> <td>Active</td> <td>UP</td> <td>Edit Network</td> </tr> </tbody> </table>	Project	Network Name	Subnets Associated	DHCP Agents	Shared	Status	Admin State	Actions	admin	im_network	imi_subnet 192.168.99.0/24	1	No	Active	UP	Edit Network	admin	int_network	int_subnet 10.254.254.0/27	1	No	Active	UP	Edit Network	admin	private_network	private_subnet 192.168.100.0/24	1	No	Active	UP	Edit Network	admin	xs1_network	xs1_subnet 192.168.101.0/24	1	No	Active	UP	Edit Network	admin	xs2_network	xs2_subnet 192.168.102.0/24	1	No	Active	UP	Edit Network	admin	external_network	public_subnet 10.250.65.0/24	1	Yes	Active	UP	Edit Network														
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admin	external_network	public_subnet 10.250.65.0/24	1	Yes	Active	UP	Edit Network																																																																	
<p>4.</p> <p><input type="checkbox"/></p>	<p>Create and boot the iDIH VM instance from the</p>	<p>1. Get the following configuration values.</p> <p>The image ID.</p> <pre>\$ glance image-list</pre> <p>The flavor ID.</p>																																																																						

STEP #	Procedure	Description
	glance image	<pre>\$ nova flavor-list</pre> <p>The network ID(s)</p> <pre>\$ neutron net-list</pre> <p>An informative name for the instance.</p> <ul style="list-style-type: none"> <li>iDIH-Oracle</li> <li>iDIH-Mediation</li> <li>iDIH-Application</li> </ul> <p>2. Create and boot the VM instance.</p> <p>The instance must be owned by the DSR tenant user, not the admin user. Source the credentials of the DSR tenant user and issue the following command. Use one <b>--nic</b> argument for each IP/interface. Number of IP/interfaces for each VM type must conform with the interface-to-network mappings defined in [24] DSR Cloud Benchmarking Guide.</p> <p><b>Note:</b> IPv6 addresses should use the <b>v6-fixed-ip</b> argument instead of <b>v4-fixed-ip</b>.</p> <p><b>For Oracle VM Only</b></p> <p>Create the ephemeral storage for only the Oracle VM.</p> <pre>\$ nova boot --image &lt;image ID&gt; --flavor &lt;flavor id or name&gt; --nic net-id=&lt;xmi network id&gt;,v4-fixed-ip=&lt;xmi ip address&gt; --nic net-id=&lt;int network id&gt;,v4-fixed-ip=&lt;int ip address&gt; --ephemeral size=100 --config-drive true &lt;instance name&gt;</pre> <p>For example:</p> <pre>\$ nova boot --image 7e881048-190c-4b66-b26e-dc5b9dc3c07f --flavor idih.db --nic net-id=e96cb10a-9514-4702-b0c5-64fc99eb3fdd,v4-fixed-ip=10.250.65.161 --nic net-id=674b8461-ffed-4818-8dea-7544f9c06e5f,v4-fixed-ip=10.254.254.2 --ephemeral size=100 -config-drive true iDIH-Oracle</pre> <p><b>For Application VM Only</b></p> <pre>\$ nova boot --image &lt;image ID&gt; --flavor &lt;flavor id or name&gt; --nic net-id=&lt;xmi network id&gt;,v4-fixed-ip=&lt;xmi ip address&gt; --nic net-id=&lt;int network id&gt;,v4-fixed-ip=&lt;int ip address&gt; --config-drive true &lt;instance name&gt;</pre> <p>For example:</p> <pre>\$ nova boot --image 7e881048-190c-4b66-b26e-dc5b9dc3c07f --flavor idih.db --nic net-id=e96cb10a-9514-4702-b0c5-64fc99eb3fdd,v4-fixed-ip=10.250.65.161 --nic net-id=674b8461-ffed-4818-8dea-7544f9c06e5f,v4-fixed-ip=10.254.254.4 -config-drive true iDIH-App</pre> <p><b>For Mediation VM Only</b></p> <p>For Mediation, add the IMI interface as the IMI interface.</p> <pre>\$ nova boot --image &lt;image ID&gt; --flavor &lt;flavor id or name&gt; --nic net-id=&lt;xmi network id&gt;,v4-fixed-ip=&lt;xmi ip address&gt; --nic net-id=&lt;int network id&gt;,v4-fixed-ip=&lt;int</pre>

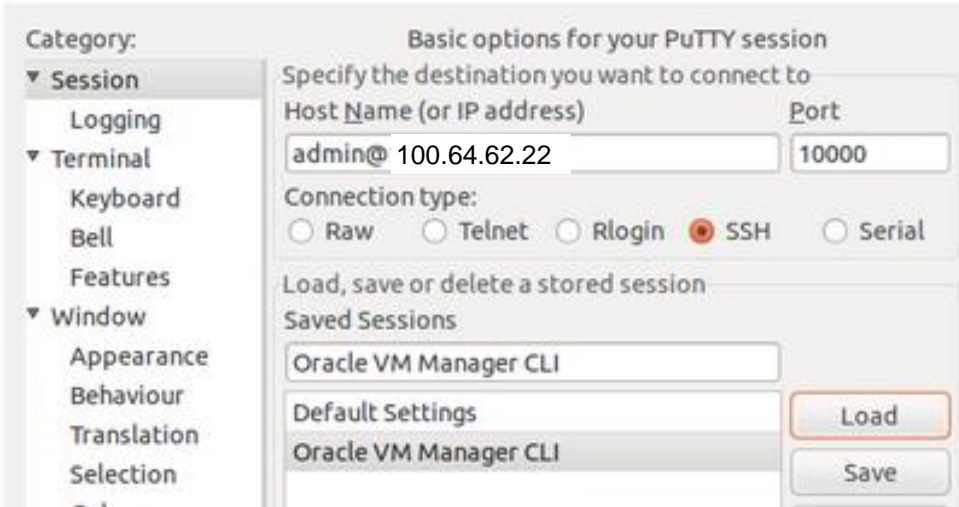
STEP #	Procedure	Description
		<pre>ip address&gt; --nic net-id=&lt;imi network id&gt;,v4-fixed- ip=&lt;imi ip address&gt; -config-drive true &lt;instance name&gt;</pre> <p>For example:</p> <pre>\$ nova boot --image f548c2cd-1ddd-4c56-b619- b49a69af8801 --flavor idih --nic net-id=e96cb10a-9514- 4702-b0c5-64fc99eb3fdd,v4-fixed-ip=10.250.65.162 --nic net-id=674b8461-ffed-4818-8dea-7544f9c06e5f,v4-fixed- ip=10.254.254.3 --nic net-id=3d9b9da8-96ad-4f29-9f82- 98b00ea30446,v4-fixed-ip=192.168.99.3 -config-drive true iDIH-Mediation</pre> <p>3. View the newly created instance using the nova tool.</p> <pre>\$ nova list --all-tenants</pre> <p>The VM takes approximately 5 minutes to boot and may be accessed through both network interfaces and the Horizon console tool.</p>
<p>5. <input type="checkbox"/></p>	<p>Verify configured interface</p>	<p>If DHCP is enabled on the Neutron subnet, VM configures the VNIC with the IP address provided in step 4. To verify, ping the XMI IP address provided with the <b>nova boot...</b> command from step 4:</p> <pre>\$ ping &lt;XMI-IP-Provided-During-Nova-Boot&gt;</pre> <p>If successfully pinging, ignore the step 6 to manually configuring the interface.</p>

STEP #	Procedure	Description
<p>6.</p> <p><input type="checkbox"/></p>	<p>Manually configure interface, if not already done (Optional)</p>	<p><b>Note:</b> If the instance is already configured with an interface and has successfully pinged (step 5), then <b>ignore</b> this step to configure the interface manually.</p> <ol style="list-style-type: none"> <li>1. Log into the <b>Horizon</b> GUI as the DSR tenant user.</li> <li>2. Go to the Compute/Instances section.</li> <li>3. Click the <b>Name</b> field of the newly created instance.</li> <li>4. Select the Console tab.</li> <li>5. Login as the <b>admusr</b> user.</li> <li>6. Configure the network interfaces, conforming with the interface-to-network mappings defined in [24] DSR Cloud Benchmarking Guide.</li> </ol> <pre>\$ sudo netAdm add --onboot=yes --device=eth0 -- address=&lt;xmi ip&gt; --netmask=&lt;xmi net mask&gt;  \$ sudo netAdm add --onboot=yes --device=eth1 -- address=&lt;int ip&gt; --netmask=&lt;int net mask&gt;  \$ sudo netAdm add --route=default --device=eth0 -- gateway=&lt;xmi gateway ip&gt;</pre> <p>An additional interface eth2 needs to be configured <b>ONLY</b> for Mediation VM. To configure the eth2:</p> <pre>\$ sudo netAdm add --onboot=yes --device=eth2 -- address=&lt;imi ip&gt; --netmask=&lt;imi net mask&gt;</pre> <ol style="list-style-type: none"> <li>7. Reboot the VM. It takes approximately 5 minutes for the VM to complete rebooting.</li> </ol> <pre>\$ sudo init 6</pre> <p>The new VM should now be accessible using both network and Horizon consoles.</p>
<p>7.</p> <p><input type="checkbox"/></p>	<p>Repeat</p>	<p>Repeat steps 1 through 4 for the following VMs. Use unique labels for the VM names:</p> <ul style="list-style-type: none"> <li>iDIH-Application</li> <li>iDIH-Mediation</li> </ul>

## 5.8 Create IDIH Virtual Machines - OVM-S/OVM-M (Optional)

### Procedure 38. (OVM-S/OVM-M). Import Three IDIH OVAs and Create and Configure a VM for Each

STEP #	Procedure	Description
		<p>This procedure imports the IDIH image and creates/configures a VM. Repeat this procedure three times for:</p> <ul style="list-style-type: none"> <li>• IDIH-Oracle (db)</li> <li>• IDIH-Application (app)</li> <li>• IDIH-Mediation (med)</li> </ul> <p>Replace XXX in variable names with the different suffix – when repeating.</p> <p>This procedure requires values for these variables:</p> <ul style="list-style-type: none"> <li>• &lt;OVM-M IP&gt; = IP address to access a sh prompt on the OVM server</li> <li>• &lt;URL to IDIH-XXX OVA&gt;= link(s) to a source for each IDIH product image (.ova)</li> <li>• &lt;MyRepository name&gt; = name of the repository in the OVM to hold the product images (.ova)</li> <li>• &lt;ServerPool name&gt;</li> <li>• &lt;VM name&gt;</li> <li>• &lt;OVM network ID for XMI&gt;</li> <li>• &lt;OVM network ID for IDIH Internal&gt;</li> <li>• &lt;OVM network ID for IMI&gt;</li> </ul> <p>Execution of this procedure will discover and use the values of these variables:</p> <ul style="list-style-type: none"> <li>• &lt;Virtual Appliance IDIH-XXX OVA ID&gt;</li> <li>• &lt;IDIH-XXX-OVA VM name_vm_vm&gt;</li> <li>• &lt;VM id&gt;</li> <li>• &lt;vCPUs Production&gt;</li> <li>• &lt;Vnic 1 id&gt;</li> <li>• &lt;size in GB&gt;</li> <li>• &lt;VirtualDiskId&gt;</li> <li>• &lt;VirtualDiskName&gt;</li> <li>• &lt;Slot#&gt;</li> </ul> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
<p>1.</p> <p>□</p>	<p><b>Preparation:</b> Access command line of OVM</p>	<p>Refer to Common OVM Manager Tasks (CLI) for setting up the platform.</p> <p>1. Use the respective value for &lt;OVM-M IP&gt; into the command.</p> <pre>ssh -l admin &lt;OVM-M IP&gt; -p 10000</pre> <p>Example: <code>ssh -l admin 100.64.62.221 -p 10000</code></p> <p>Alternate: use a terminal emulation tool like putty.</p> 

STEP #	Procedure	Description
<p>2.</p> <p>□</p>	<p><b>OVM-M CLI:</b> Import the VirtualAppliance/OVA for IDIH-XXX</p>	<ol style="list-style-type: none"> <li>Use the respective values for &lt;MyRepository name&gt; and &lt;URL to IDIH-XXX OVA&gt; into the command.                     <pre>OVM&gt;importVirtualAppliance Repository name='&lt;MyRepository name&gt;' url=&lt;URL to IDIH-XXX OVA&gt;</pre> <p>Example:</p> <pre>OVM&gt; importVirtualAppliance Repository name='XLab Utility Repo01' url=http://10.240.155.70/iso/IDIH/8.2/ova/oracle- 8.2.3.0.0_82.40.0.ova</pre> </li> <li>Execute the command and validate success.</li> <li>Examine the screen results to find site-specific text for <b>variables</b> in these locations:                     <pre>Command: importVirtualAppliance Repository name='XLab Utility Repo01' url=http://10.240.155.70/iso/DSR/8.5/ova/DSR- 8.5.0.0.0_90.11.0.ova</pre> <p>Status: Success</p> <p>Time: 2017-04-18 15:23:31,044 EDT</p> <p>JobId: 1492543363365</p> <p>Data:</p> <pre>ID: 1128a1c6ce name: DSR-8.5.0.0.0_90.11.0.ova</pre> </li> <li>Use the respective values for values for these variables (overwrite example).                     <pre>&lt;Virtual Appliance IDIH-XXX OVA ID&gt; = 1128a1c6ce</pre> </li> </ol>



STEP #	Procedure	Description
3. □	<b>OVM-M CLI:</b> Get the virtual appliance name. It is used in <IDIH-XXX OVA VM name> in later steps	<p>1. Use the respective values for &lt;Virtual Appliance IDIH-XXX OVA ID&gt; in the command.</p> <pre>OVM&gt; show VirtualAppliance id=&lt;Virtual Appliance IDIH-XXX OVA id&gt;</pre> <p>Example:</p> <pre>OVM&gt; show VirtualAppliance id=1128a1c6ce</pre> <p>2. Execute the command and validate success.</p> <p>3. Examine the screen results to find site-specific text for <b>variables</b> in these locations:</p> <pre>Command: show VirtualAppliance id=1128a1c6ce Status: Success Time: 2017-04-18 15:23:53,534 EDT Data:   Origin = http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova   Repository = 0004fb0000030000da5738315337bfc7 [XLab Utility Repo01]   Virtual Appliance Vm 1 = 11145510c0_vm_vm [vm]   Virtual Appliance VirtualDisk 1 = 11145510c0_disk_disk1 [disk1]   Id = 11145510c0 [DSR-8.5.0.0.0_90.11.0.ova]   Name = DSR-8.5.0.0.0_90.11.0.ova   Description = Import URL: http://10.240.155.70/iso/DSR/8.5/ova/DSR-8.5.0.0.0_90.11.0.ova   Locked = false</pre> <p>4. Use the respective values for these variables (overwrite example). &lt;IDIH-XXX-OVA VM name_vm_vm&gt; = 11145510c0_vm_vm</p>

STEP #	Procedure	Description
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create a VM for IDIH-XXX OVA VM</p>	<p><b>Create a virtual machine from the virtual machine in the OVA virtual appliance.</b></p> <ol style="list-style-type: none"> <li>1. Use the respective value for &lt;IDIH-db-OVA VM name_vm_vm&gt; into the command.   <pre>OVM&gt; createVmFromVirtualApplianceVm VirtualApplianceVm name=&lt;IDIH-XXX-OVA VM name_vm_vm&gt;</pre> <p>Example:  <pre>OVM&gt; createVmFromVirtualApplianceVm VirtualApplianceVm name=11145510c0_vm_vm</pre></p> </li> <li>2. Execute the command and validate success.</li> <li>3. Examine the screen results to find site-specific text for <b>variables</b> in these locations:   <p>Command: <pre>createVmFromVirtualApplianceVm VirtualApplianceVm name=11145510c0_vm_vm</pre>  Status: Success   Time: 2017-04-18 16:02:09,141 EDT   JobId: 1492545641976   Data:  <pre>id: 0004fb00000600004a0e02bdf9fc1bcd name: oracle-8.5.0.0.0_90.11.0.ova</pre></p> </li> <li>4. Use the respective values for these variables (overwrite example).   <pre>&lt;VM id&gt; = 0004fb00000600004a0e02bdf9fc1bcd</pre></li> </ol>
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Add the VM to the server pool</p>	<ol style="list-style-type: none"> <li>1. Use the respective values for &lt;VM ID&gt; and &lt;ServerPool name&gt; into the command.   <pre>OVM&gt; add Vm id=&lt;VM id&gt; to ServerPool name="&lt;ServerPool name&gt;"</pre> <p>Example:  <pre>OVM&gt; add Vm id=0004fb00000600004a0e02bdf9fc1bcd to ServerPool name="XLab Pool 01"</pre></p> </li> <li>2. Execute the command and validate success.</li> </ol> <p><b>Note:</b> Refer Server Pool section in Appendix D.2 for further information on Server Pool.</p>

STEP #	Procedure	Description																
6. <input type="checkbox"/>	<b>OVM-M CLI:</b> Edit VM to apply required profile/resources	<p>1. Refer to [24] DSR Cloud Benchmarking Guide for recommended resource.</p> <table border="1"> <thead> <tr> <th>VM Name</th> <th>vCPUs Lab</th> <th>RAM (GB) Lab</th> <th>vCPUs Production</th> <th>RAM (GB) Production</th> <th>Storage (GB) Lab and Production</th> </tr> </thead> <tbody> <tr> <td>Type of guest host</td> <td>#</td> <td>#</td> <td>#</td> <td>#</td> <td>#</td> </tr> </tbody> </table> <p>2. Use the respective values for &lt;VM ID&gt;, &lt;VM name&gt;, and &lt;vCPUs Production&gt; into the command.</p> <pre>OVM&gt; edit Vm id=&lt;VM id&gt; name=&lt;VM name&gt; memory=6144 memoryLimit=6144 cpuCountLimit=&lt;vCPUs Production&gt; cpuCount=&lt;vCPUs Production&gt; domainType=XEN_HVM description="&lt;VM name&gt;"</pre> <p>Example:</p> <pre>OVM&gt; edit Vm id=0004fb00000600004a0e02bdf9fc1bcd name= na_idih-db memory=6144 memoryLimit=6144 cpuCountLimit=4 cpuCount=4 domainType=XEN_HVM description="na_idih-db"</pre> <p>3. Execute the command and validate success.</p> <p>Now, the VM has a name and resources.</p>	VM Name	vCPUs Lab	RAM (GB) Lab	vCPUs Production	RAM (GB) Production	Storage (GB) Lab and Production	Type of guest host	#	#	#	#	#				
VM Name	vCPUs Lab	RAM (GB) Lab	vCPUs Production	RAM (GB) Production	Storage (GB) Lab and Production													
Type of guest host	#	#	#	#	#													
7. <input type="checkbox"/>	<b>OVM-M CLI:</b> Determine VNIC ID	<p>1. Use the respective value for &lt;VM name&gt; in the command.</p> <pre>OVM&gt; show Vm name=&lt;VM name&gt;</pre> <p>Example:</p> <pre>OVM&gt; show Vm name= na_idih-db</pre> <p>2. Execute the command and validate success.</p> <p>3. Examine the screen results to find site-specific text for <b>variables</b> in these locations:</p> <pre>Vnic 1 = 0004fb0000070000091e1ab5ae291d8a</pre> <p>4. Use the respective values for these variables (overwrite example).</p> <pre>&lt;Vnic 1 ID&gt; = 0004fb0000070000091e1ab5ae291d8a</pre>																
8. <input type="checkbox"/>	Determine network interfaces for the type of guest host	<p>Refer to [24] DSR Cloud Benchmarking Guide to learn which network interfaces need to be configured for each guest type. The table looks like this:</p> <table border="1"> <thead> <tr> <th></th> <th>OAM (XMI)</th> <th>Loca I (IMI)</th> <th>Sig A (XS11)</th> <th>Sig B (XS12)</th> <th>Sig C (XS13-16)</th> <th>Rep (SBR)</th> <th>DIH Internat I</th> </tr> </thead> <tbody> <tr> <td>Type of guest host</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> <td>eth#</td> </tr> </tbody> </table> <p><b>Note:</b> The VNICs need to be created in the correct order so the interfaces are associated with the correct network.</p>		OAM (XMI)	Loca I (IMI)	Sig A (XS11)	Sig B (XS12)	Sig C (XS13-16)	Rep (SBR)	DIH Internat I	Type of guest host	eth#	eth#	eth#	eth#	eth#	eth#	eth#
	OAM (XMI)	Loca I (IMI)	Sig A (XS11)	Sig B (XS12)	Sig C (XS13-16)	Rep (SBR)	DIH Internat I											
Type of guest host	eth#	eth#	eth#	eth#	eth#	eth#	eth#											

STEP #	Procedure	Description
9. <input type="checkbox"/>	<b>OVM-M CLI:</b> Add (attach) XMI VNIC ID of the XMI network to VM (if required by guest host type)	<ol style="list-style-type: none"> <li>Use the respective values for &lt;Vnic 1 ID&gt; and &lt;OVM network ID for XMI&gt; into the command  <pre>OVM&gt; add Vnic ID=&lt;Vnic 1 ID&gt; to Network name=&lt;OVM network ID for XMI&gt;</pre> <p>Example:  <pre>OVM&gt; add Vnic ID=0004fb0000070000091e1ab5ae291d8a to Network name=10345112c9</pre></p> </li> <li>Execute the command and validate success.</li> </ol>
10. <input type="checkbox"/>	<b>OVM-M CLI:</b> Create and attach IDIH Internal VNIC to VM (if required by guest host type)	<ol style="list-style-type: none"> <li>Use the respective values for &lt;OVM network ID for IDIH Internal&gt; and &lt;VM name&gt; into the command  <pre>OVM&gt; create Vnic network=&lt;OVM network id for IDIH Internal&gt; name=&lt;VM name&gt;-int on Vm name=&lt;VM name&gt;</pre> <p>Example:  <pre>OVM&gt; create Vnic network=DIH Internal name=na_idih-db-int on Vm name=na_idih-db</pre></p> </li> <li>Execute the command and validate success</li> </ol>
11. <input type="checkbox"/>	<b>OVM-M CLI:</b> Create and attach IMI VNIC ID to VM (if required by guest host type)	<ol style="list-style-type: none"> <li>Use the respective values for &lt;OVM network ID for IMI&gt; and &lt;VM name&gt; into the command.  <pre>OVM&gt; create Vnic network=&lt;OVM network ID for IMI&gt; name=&lt;VM name&gt;-IMI on VM name=&lt;VM name&gt;</pre> <p>Example:  <pre>OVM&gt; create Vnic network=102e89a481 name= na_idih-db-IMI on Vm name= na_idih-db</pre></p> </li> <li>Execute the command and validate success.</li> </ol>

STEP #	Procedure	Description
<p>12. □</p>	<p><b>[iDIH Oracle VM Only] OVM-M CLI:</b> Create a raw storage block device (external device)</p>	<p><b>Create an extra virtual disk (only required on IDIH-Oracle (db) if the system is using OVM).</b></p> <ol style="list-style-type: none"> <li>1. Decide on a name for the virtual disk: &lt;VirtualDiskName&gt;</li> <li>2. Refer the resource profiles defined in [24] DSR Cloud Benchmarking Guide to learn the required GB of Storage for the IDIH type: &lt;size in GB&gt;</li> <li>3. Use the respective value for &lt;MyRepository Name&gt; into the command.  <pre>OVM&gt; create VirtualDisk name='&lt;VirtualDiskName&gt;' size=&lt;size in GB&gt; sparse=&lt;Yes/No&gt; shareable=&lt;Yes/No&gt; on Repository name='&lt;MyRepository Name&gt;'</pre> <p><b>Example:</b></p> <pre>OVM&gt; create VirtualDisk name=idih-db_disk1 size=100 sparse=No shareable=No on Repository name='XLab Utility Repo01'</pre> </li> <li>4. Examine the screen results to find site-specific text for <b>variables</b> in these locations:  <pre>Command: create VirtualDisk name=idih-db_disk size=100 sparse=No shareable=No on Repository name='XLab Utility Repo01'</pre> <pre>Status: Success</pre> <pre>Time: 2017-04-24 15:29:12,502 EDT</pre> <pre>JobId: 1493061481113</pre> <pre>Data:</pre> <pre>id:0004fb00001200001bae7adbe6b20e19.img name:idih- db_disk</pre> </li> <li>5. Use the respective values for these variables (overwrite example).  <pre>&lt;VirtualDiskId&gt; = 0004fb00001200001bae7adbe6b20e19.img &lt;VirtualDiskName&gt; = idih-db_disk</pre> </li> </ol>

STEP #	Procedure	Description
13. <input type="checkbox"/>	<b>[iDIH Oracle VM Only] OVM-M CLI:</b> Map the created virtual disk to a slot on the VM	<ol style="list-style-type: none"> <li>Decide on a slot for the virtual disk: &lt;Slot#&gt;</li> <li>Use the respective values for &lt;Slot#&gt; &amp; &lt;VirtualDiskId&gt; &amp; &lt;VirtualDiskName&gt; &amp; &lt;VM name&gt; into the command.   <pre>OVM&gt; create VmDiskMapping slot=&lt;Slot#&gt; virtualDisk=&lt;VirtualDiskId&gt; name="&lt;VirtualDiskName&gt;" on Vm name=&lt;VM name&gt;</pre> <p>Example:  <pre>OVM&gt; create VmDiskMapping slot=2 virtualDisk=0004fb00001200001bae7adbe6b20e19.img name='idih-db_disk' on Vm name=na_idih-db</pre></p> </li> <li>Execute the command and validate success.   <pre>Command: create VmDiskMapping slot=2 virtualDisk=0004fb00001200001bae7adbe6b20e19.img name='idih-db_disk' on Vm name=na_idih-db</pre> <p>Status: Success  Time: 2017-04-24 15:32:50,875 EDT  JobId: 1493062370724  Data:  id:0004fb000013000057ab9b00e6d47add name:idih-db_disk </p></li> </ol>
14. <input type="checkbox"/>	<b>OVM-M CLI:</b> Start VM	<ol style="list-style-type: none"> <li>Use the respective value for &lt;VM name&gt; into the command   <pre>OVM&gt; start Vm name=&lt;VM name&gt;</pre> <p>Example:  <pre>OVM&gt; start Vm name= na_idih-db</pre></p> </li> <li>Execute the command and validate success</li> </ol>
15. <input type="checkbox"/>	Repeat	Repeat steps 2 through 14 for the following VMs. Use Unique labels for the VM names: iDIH-Application iDIH-Mediation

## 5.9 Configure iDIH Virtual Machines (Optional)

### Procedure 39. Configure iDIH VM Networks (Optional)

STEP #	Procedure	Description
<p>This procedure configures the iDIH guest VM external management networks.  Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.  If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	Log into the Oracle VM console	<ol style="list-style-type: none"> <li>Access the iDIH Oracle VM console.</li> <li>Login as the <b>admusr</b> user.</li> </ol>

<p>2.</p> <p><input type="checkbox"/></p>	<p>(Oracle VM only) Verify the extra/second disk exists</p>	<p><b>Note:</b> This step is required <b>ONLY</b> for the Oracle VM.</p> <p>Check if the raw storage block device (external disk) exists by executing any of below commands (similar to the screenshot):</p> <pre>\$ ls /dev/[sv]db</pre> <p><b>Note:</b> The command [sv] db means, <code>sdb</code> and <code>vdb</code>, depending on the hardware.</p> <p>Example using, <code>\$ ls /dev/sdb</code></p> <pre>Disk /dev/sdb: 107.4 GB, 107374182400 bytes 255 heads, 63 sectors/track, 13054 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x00000000</pre> <pre>\$ sudo fdisk -l</pre> <pre>Disk /dev/vda: 75.2 GB, 75161927680 bytes 16 heads, 63 sectors/track, 145635 cylinders Units = cylinders of 1008 * 512 = 516096 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x000af813</pre> <table border="1"> <thead> <tr> <th>Device</th> <th>Boot</th> <th>Start</th> <th>End</th> <th>Blocks</th> <th>Id</th> <th>System</th> </tr> </thead> <tbody> <tr> <td>/dev/vda1</td> <td>*</td> <td>3</td> <td>1043</td> <td>524288</td> <td>83</td> <td>Linux</td> </tr> <tr> <td>/dev/vda2</td> <td></td> <td>1043</td> <td>145636</td> <td>72875008</td> <td>8e</td> <td>Linux LVM</td> </tr> </tbody> </table> <pre>Disk /dev/mapper/vgroot-plat_root: 1073 MB, 1073741824 bytes 255 heads, 63 sectors/track, 130 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x00000000</pre> <pre>\$ df -h</pre> <pre>[admusr@DsrSite00NOAM00 ~]\$ df -h Filesystem      Size  Used Avail Use% Mounted on /dev/mapper/vgroot-plat_root                 976M  289M  637M  32% / tmpfs           2.9G   0  2.9G   0% /dev/shm /dev/vda1       488M   38M  426M   9% /boot /dev/mapper/vgroot-plat_tmp                 976M   1.6M  924M   1% /tmp /dev/mapper/vgroot-plat_usr                 4.8G   3.0G   1.6G  66% /usr /dev/mapper/vgroot-plat_var                 976M  427M  499M  47% /var /dev/mapper/vgroot-plat_var_tklc                 3.9G  189M   3.5G   6% /var/TKLC /dev/mapper/vgroot-apw_tmp                 8.3G   20M   7.8G   1% /tmp/appworks_temp /dev/mapper/vgroot-netbackup_lv                 4.8G   10M   4.6G   1% /usr/opencv /dev/mapper/vgroot-logs_process                 3.3G   11M   3.2G   1% /var/TKLC/appw/logs/Process /dev/mapper/vgroot-logs_security                 488M  396K  462M   1% /var/TKLC/appw/logs/Security /dev/mapper/vgroot-filemgmt                 14G   42M   14G   1% /var/TKLC/db/filemgmt /dev/mapper/vgroot-run_db                 8.3G  230M   7.6G   3% /var/TKLC/rundb</pre>	Device	Boot	Start	End	Blocks	Id	System	/dev/vda1	*	3	1043	524288	83	Linux	/dev/vda2		1043	145636	72875008	8e	Linux LVM
Device	Boot	Start	End	Blocks	Id	System																	
/dev/vda1	*	3	1043	524288	83	Linux																	
/dev/vda2		1043	145636	72875008	8e	Linux LVM																	

STEP #	Procedure	Description
		<p>If the extra disk does not exist, revisit the procedures for respective hypervisors. (Procedure 36 for VMware, Procedure 37 for KVM, and Procedure 38 for OVM-M).</p> <p><b>Note:</b> Please DO NOT mount or format the added raw block device. Oracle ASM (Automatic Storage Management) automatically manages it. To verify it, execute the following command:</p> <pre>\$ df</pre> <p>If you see it has been mounted, unmount it and completely remove the entry in the /etc/fstab.</p> <p><b>For example:</b></p> <ol style="list-style-type: none"> <li>1. If any external drive (such as, /dev/vdb) is mounted, then unmount the external drive by executing the following command on oracle server: <code>umount /dev/vdb</code></li> <li>2. Edit the /etc/fstab file on oracle server and if any entry for /dev/vdb is present in the file, then remove the entry and save the file.</li> </ol>
<p>3.</p> <input type="checkbox"/>	<p>Delete the eth0 interface</p>	<pre>\$ sudo netAdm delete --device=eth0</pre> <p><b>Note:</b> Note down the MAC address before the eth0 is deleted. This helps in identifying the MAC address of eth0 in case the persistence net rules file is not generated.</p>
<p>4.</p> <input type="checkbox"/>	<p>Trigger net rules file creation</p>	<p>Run the udevadm command to recreate net rules file.</p> <pre>\$ sudo udevadm trigger --subsystem-match=net</pre> <p><b>Note:</b> If this command does not create the net rules file, create it manually. Refer to Sample Net Rules File.</p>
<p>5.</p> <input type="checkbox"/>	<p>Modify the ethernet interface names in the net rules file</p>	<ol style="list-style-type: none"> <li>1. Update the net rules file to replace the default interfaces names ethX with XMI and INT interfaces names. Replace <b>eth0</b> with <b>xmi</b>; and <b>eth1</b> with <b>int</b> interface. Also, respective MAC addresses should be updated for each interface in lower case. MAC addresses can be determined using <code>ifconfig -a</code> command from the console.</li> </ol> <p><b>Note:</b> The Mediation VM requires the user to rename a third interface: <b>eth2</b> as <b>imi</b> interface.</p> <ol style="list-style-type: none"> <li>2. Refer to Sample Net Rules File for a sample net rules file.</li> </ol> <pre>\$ sudo vi /etc/udev/rules.d/70-persistent-net.rules</pre> <pre># PCI device 0x15ad:0x07b8 (vmxnet3) SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", ATTR(address)="08:58:56:b9:2d:b b", ATTR(type)="1", KERNEL=="eth*", NAME="eth1"  # PCI device 0x15ad:0x07b8 (vmxnet3) SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", ATTR(address)="08:58:56:b9:ea:b 2", ATTR(type)="1", KERNEL=="eth*", NAME="eth0"  # PCI device 0x15ad:0x07b8 (vmxnet3) SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", ATTR(address)="08:58:56:b9:2d:b b", ATTR(type)="1", KERNEL=="eth*", NAME="int"  # PCI device 0x15ad:0x07b8 (vmxnet3) SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", ATTR(address)="08:58:56:b9:ea:b 2", ATTR(type)="1", KERNEL=="eth*", NAME="xmi"</pre> <ol style="list-style-type: none"> <li>3. Reboot the VM.</li> </ol> <pre>\$ sudo init 6</pre>



STEP #	Procedure	Description
<p>6.</p> <p><input type="checkbox"/></p>	<p>As admusr on the Oracle VM configure the networks with netAdm</p>	<ol style="list-style-type: none"> <li>Log into the <b>iDIH Oracle VM</b> console as the <b>admusr</b> user.</li> <li>The XMI network should already exist, but it can be created with the following command.                     <pre>\$ sudo netAdm add --device=xmi --address=&lt;IP Address in External Management Network&gt; --netmask=&lt;Netmask&gt; --onboot=yes</pre> </li> <li>Configure the int network IP address and netmask.                     <pre>\$ sudo netAdm add --device=int --address=10.254.254.2 --netmask=255.255.255.224</pre> <p><b>Note:</b> It is advisable to use the following IP as internal IP addresses defined for: Oracle VM internal IP = 10.254.254.2; the Mediation VM internal IP = 10.254.254.3; and the application internal IP address = 10.254.254.4. The netmasks for all is 255.255.255.224.</p> </li> <li><b>Mediation Only.</b> If this is a Mediation VM, configure the Mediation internal management network.                     <pre>\$ sudo netAdm add --device=imi --address=&lt;IP Address in Internal Management Network&gt; --netmask=&lt;Netmask&gt;</pre> </li> <li>Configure the default gateway.                     <pre>\$ sudo netAdm add --route=default --gateway=&lt;gateway address for the External Management Network&gt; --device=xmi</pre> </li> </ol> <p>The VM network configuration has been completed. You should be able to <b>ssh</b> into the server through XMI interface.</p>
<p>7.</p> <p><input type="checkbox"/></p>	<p>As admusr on the Oracle VM configure NTP and the Oracle VM hostname</p>	<ol style="list-style-type: none"> <li>On the Oracle VM console, launch the platform configuration menu.                     <pre>\$ sudo su - platcfg</pre> </li> <li>From the platform configuration menu configure ntpserver1 with the IP address supplied for NTP.                     <p>Navigate to <b>Network Configuration &gt; NTP &gt; Edit &gt; ntpserver1</b>.</p> <p>Click <b>Yes</b> when asked to restart NTP.</p> <p><b>Note:</b> Properly configure the NTP on the controller node to reference lower stratum NTP servers.</p> </li> <li>Exit the network configuration menu.</li> <li>Configure the Oracle VM hostname.                     <p>Navigate to <b>Server Configuration &gt; Hostname &gt; Edit</b>.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>Typically, we select hostname and identify the host as iDIH application, iDIH Mediation, and iDIH Oracle.</li> <li>Remove any occurrence of "." and the ".&lt;availability zone&gt;" name, such as ".novalocal" from the hostname that might have got appended.</li> </ul> </li> <li>Exit the platform configuration menu.</li> </ol>

STEP #	Procedure	Description
8. <input type="checkbox"/>	Repeat	Repeat Steps 1 through 7 for the following VMs. Use unique labels for the VM names: iDIH Mediation iDIH Application  <b>Note:</b> Logout and Login to each VM to update the environment variable before executing the next procedure ( <b>Procedure 38:</b> Post Installation Scripts on iDIH VMs).

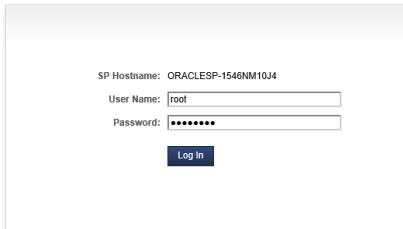
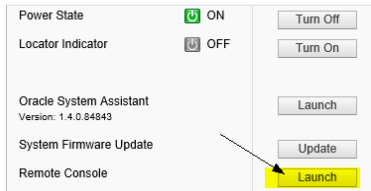
## 5.10 iDIH Installation on OL7 and KVM

iDIH Installation on OL7 and KVM includes the following procedures:

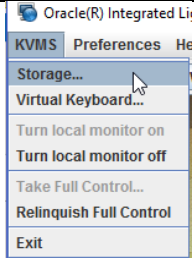
- [Install KVM](#)
- [Create SDB on KVM](#)
- [Attach device \(SDA3\) to iDIH database VM](#)
- [Resize ORA \(database\) ova image on KVM](#)
- [Fix iDIH database script on KVM](#)

### 5.10.1 Install KVM

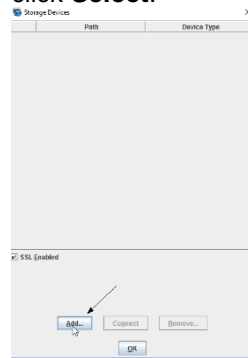
#### Procedure 40. Install KVM

STEP #	Procedure	Description
1	Logon to the ILOM as root.	<p>Please Log In</p> 
2	Launch the remote console	<p>On the main Summary Page – select the <b>Launch</b> button next to remote console.</p>  <p>Select 'continue' on the JAVA security warning pop-up</p>
3	Connect the Oracle Linux ISO Image (If FW Upgrade is	In the <b>KVMS</b> menu, select the <b>Storage...</b> option.

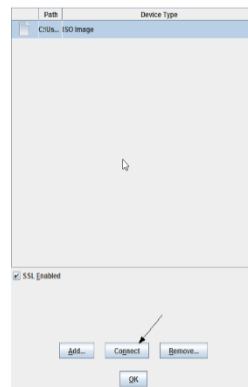
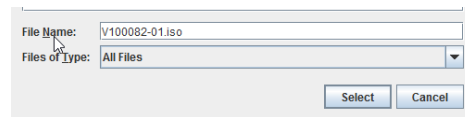
required, apply same procedure)

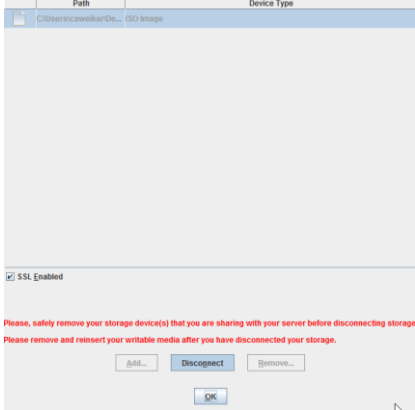
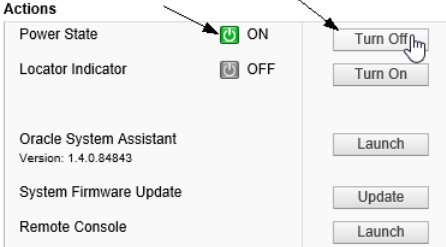
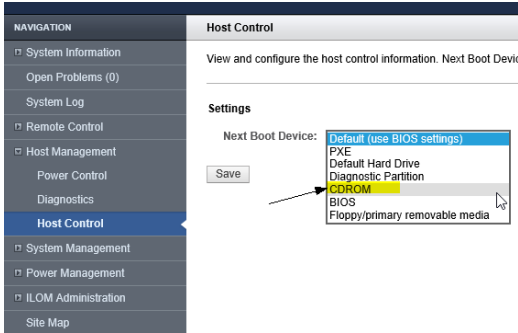


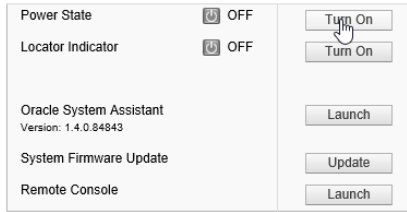

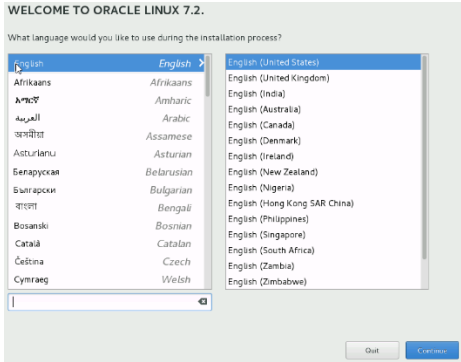

A window entitled **Storage Devices** will open up. Click **Add** and navigate to the location of the ISO on the local workstation. Select the ISO and then click **Select**.



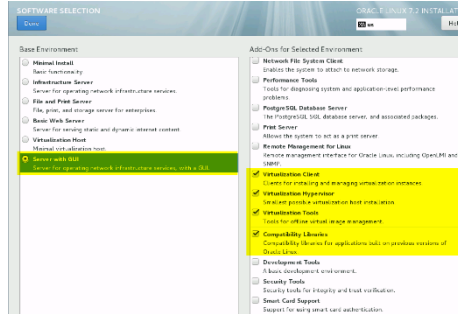
The ISO file will now be included in the list of available storage devices. Select it in the **Storage Devices** window and then click **Connect**.



	<p>Message when the ISO is connected will be displayed</p>	 <p>Click OK to confirm and close the window.</p>
<p>4</p>	<p>Shut down the server gracefully</p>	<p>On the <b>System Summary</b> page click the <b>Power State Turn Off</b> button in the <b>Actions</b> Pane. Click <b>OK</b> at the confirmation prompt.</p>  <p><b>NOTE:</b> This will perform a graceful shutdown of the operating system prior to powering off the host server. Wait for the indicator to signify that the server is powered down before proceeding to the next step.</p> <p><b>**Note:</b> If at any point the internet connection on the local workstation is lost or the browser being used is closed and the OSA has not yet been updated, the Oracle System Assistant Updater ISO must be remounted using the previous steps.</p>
<p>5</p>	<p>Set CDROM as the next boot device</p>	<p>Under the <b>Host Management</b> tab select the <b>Host Control</b> option. From the drop-down menu for <b>Next Boot Device</b>, select the <b>CDROM</b> option and then click <b>Save</b>.</p> 
<p>6</p>	<p>Power ON the server</p>	<p>On the System Summary page click on the <b>Power State Turn On</b> button in the <b>Actions</b> Pane to boot into the Oracle System Assistant Updater ISO. Click <b>OK</b> at the confirmation prompt.</p>

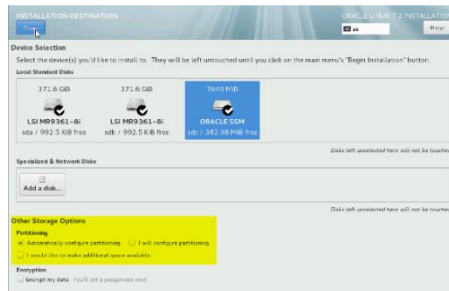
		<p><b>Actions</b></p> 
<p>7</p>	<p>Oracle Linux OS installation</p>	<p>Go back to the window that contains the Remote Console. If the window was closed, re-launch the console in the <b>Actions</b> Pane.</p> <p>The system will boot into the installation.</p> <ol style="list-style-type: none"> <li>Select 'install Oracle Linux xx' and &lt;enter&gt;.</li> </ol>  <ol style="list-style-type: none"> <li>Select Language and continue.</li> </ol>  <ol style="list-style-type: none"> <li>Select Date and Time – confirm and then select done.</li> </ol> 

4. Select Software selection with the following options
  - I. Basic Environment: Server with GUI
  - II. Add-ons for Selected Environment:
    - Virtualization Client
    - Virtualization Hypervisor
    - Virtualization Tools
    - Compatibility Libraries

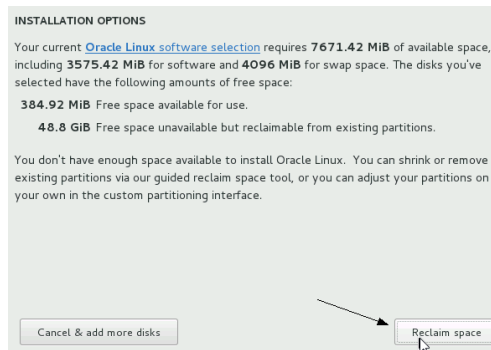


Confirm and then click **Done**.

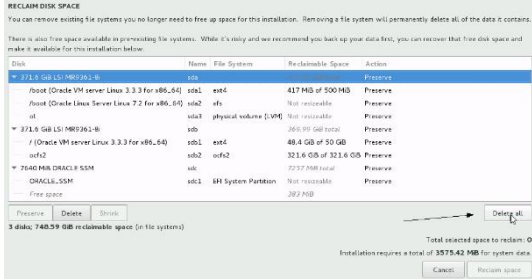
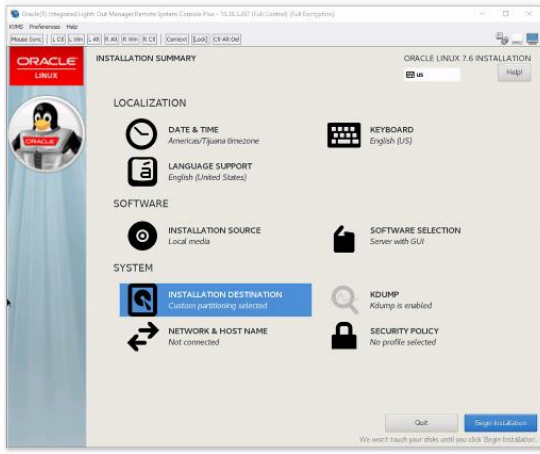
5. Select Installation Destination
  - a. Select all hard drives to be installed.
  - b. Under **Other Storage Options**, ensure **Automatically configure partitioning** is selected.
  - c. Click **Done**.

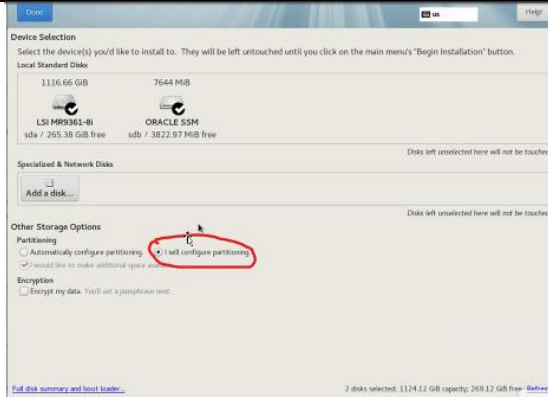


When prompted with **INSTALLATION OPTIONS** screen, select **Reclaim space**.

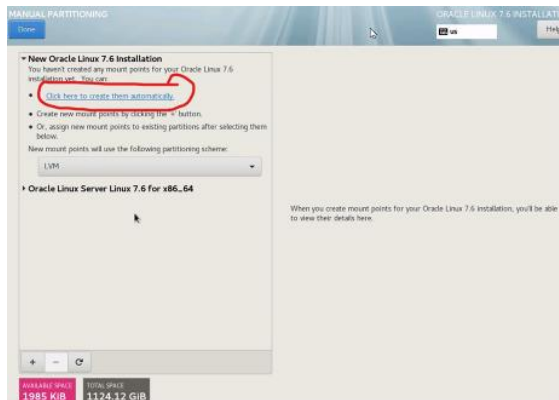


When prompted with **RECLAIM DISK SPACE** screen, select **Delete all**, followed by **Reclaim space**.

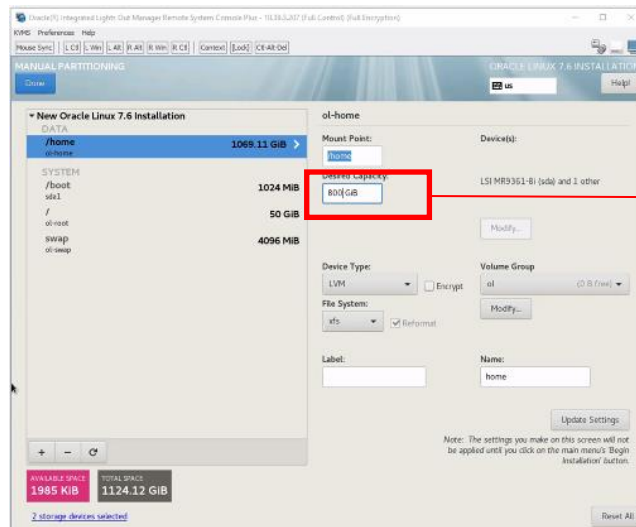
		 <p><b>RECLAIM DISK SPACE</b> You can remove existing file systems you no longer need to free up space for this installation. Removing a file system will permanently delete all of the data it contains. There is also free space available in pre-existing file systems. While it's risky and we recommend you back up your data first, you can recover that free disk space and make it available for this installation below.</p> <table border="1"> <thead> <tr> <th>Disk</th> <th>Name</th> <th>File System</th> <th>Reclaimable Space</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>371.8 GB LS1 MR9361-B</td> <td>sdg</td> <td></td> <td></td> <td>Delete</td> </tr> <tr> <td>./boot (Oracle VM server Linux 3.3.3 For x86_64)</td> <td>ext4</td> <td>ext4</td> <td>417 MB of 500 MB</td> <td>Preserve</td> </tr> <tr> <td>./boot (Oracle Linux Server Linux 7.2 For x86_64)</td> <td>xfs</td> <td>xfs</td> <td>Not reclaimable</td> <td>Preserve</td> </tr> <tr> <td>./dt</td> <td>sdg1</td> <td>physical volume (LVM)</td> <td>Not reclaimable</td> <td>Preserve</td> </tr> <tr> <td>371.8 GB LS1 MR9361-B</td> <td>sdh</td> <td></td> <td>265.99 GB total</td> <td>Preserve</td> </tr> <tr> <td>./ (Oracle VM server Linux 3.3.3 For x86_64)</td> <td>ext4</td> <td>ext4</td> <td>48.4 GB of 50 GB</td> <td>Preserve</td> </tr> <tr> <td>./opt2</td> <td>ext4</td> <td>ext4</td> <td>321.6 GB of 321.6 GB</td> <td>Preserve</td> </tr> <tr> <td>7640 MB ORACLE SSM</td> <td>sdk</td> <td></td> <td>7237 MB total</td> <td>Preserve</td> </tr> <tr> <td>ORACLE_SSM</td> <td>sdk1</td> <td>EFI System Partition</td> <td>Not reclaimable</td> <td>Preserve</td> </tr> <tr> <td>Free space</td> <td></td> <td></td> <td>283 MB</td> <td></td> </tr> </tbody> </table> <p>3 disks: 748.59 GB reclaimable space (in file systems)</p> <p>Total selected space to reclaim: 0 Installation requires a total of 3573.42 MB for system data.</p>	Disk	Name	File System	Reclaimable Space	Action	371.8 GB LS1 MR9361-B	sdg			Delete	./boot (Oracle VM server Linux 3.3.3 For x86_64)	ext4	ext4	417 MB of 500 MB	Preserve	./boot (Oracle Linux Server Linux 7.2 For x86_64)	xfs	xfs	Not reclaimable	Preserve	./dt	sdg1	physical volume (LVM)	Not reclaimable	Preserve	371.8 GB LS1 MR9361-B	sdh		265.99 GB total	Preserve	./ (Oracle VM server Linux 3.3.3 For x86_64)	ext4	ext4	48.4 GB of 50 GB	Preserve	./opt2	ext4	ext4	321.6 GB of 321.6 GB	Preserve	7640 MB ORACLE SSM	sdk		7237 MB total	Preserve	ORACLE_SSM	sdk1	EFI System Partition	Not reclaimable	Preserve	Free space			283 MB	
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Free space			283 MB																																																						
7.1	Reduce Home space on KVM (IDIH Database) - Optional	<p><b>IMPORTANT NOTE:</b> The steps from 6 to 9 only apply for KVM that will store the VM for IDIH Database.</p> <ol style="list-style-type: none"> <li>6. Once again Select Installation Destination             <ol style="list-style-type: none"> <li>a. Select all hard drives to be installed.</li> <li>b. Under <b>Other Storage Options</b>, ensure <b>I will configure partitioning</b>.</li> <li>c. Click <b>Done</b>.</li> </ol> </li> </ol> 																																																							



7. Select **Click here to create them automatically.**



8. **⚠ IMPORTANT:** Modify “home” to 800Gi and click **Update Settings.**

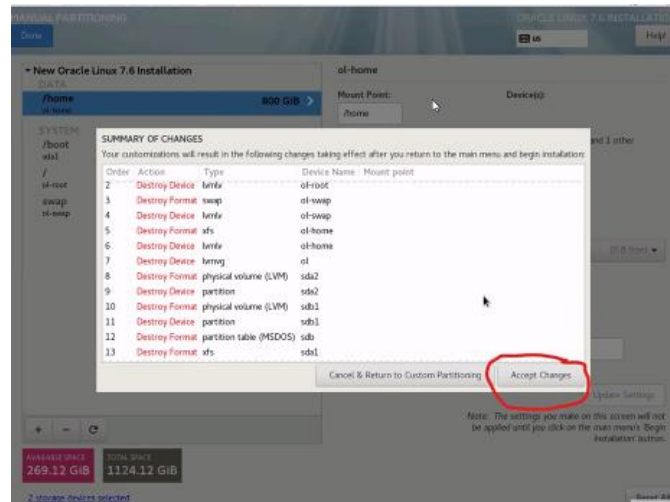


Adjust to 800Gib



NOTE: The Desired Capacity field is customizable. In the above scenario, 800GB has been allocated to /home directory out of 1TB space. It is expected to retain about 200GB of free space out of total memory. This space can later be utilized for adding ephemeral disk.

9. Click **Accept Changes** and **Done**.



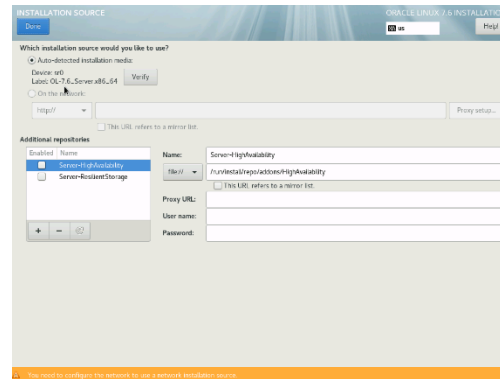
7.2

Run Installation on KVM

10. Verify Installation Source

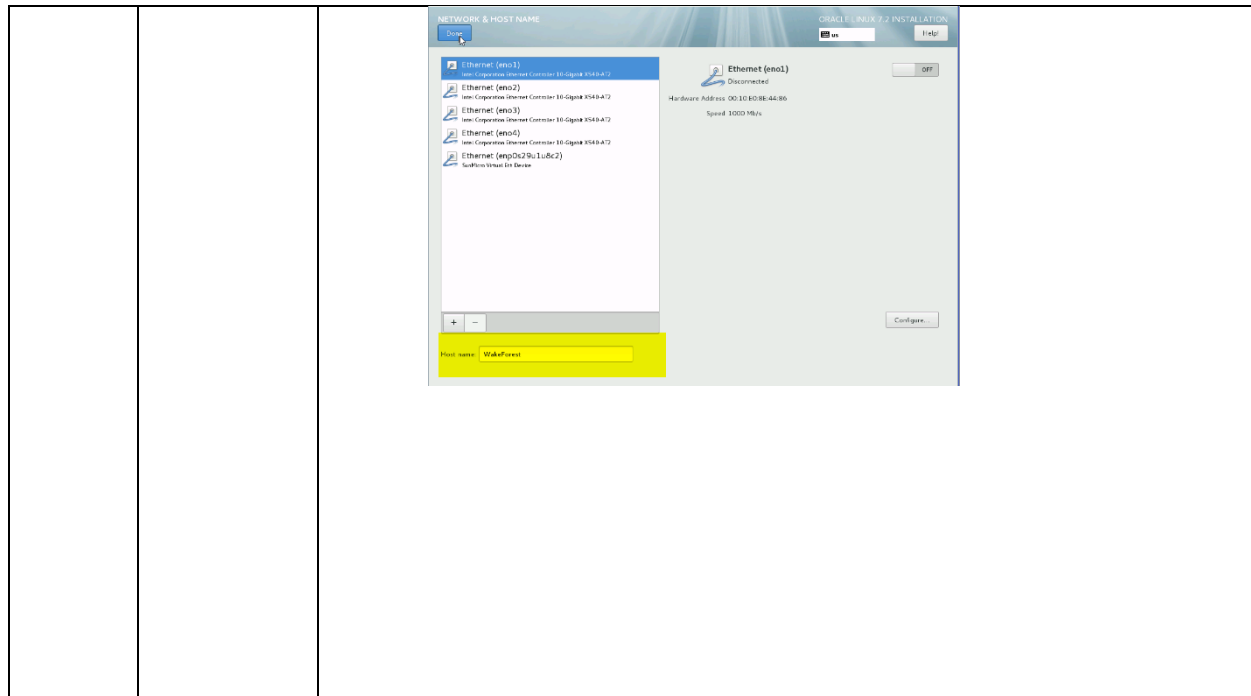
'Auto-detected' should be automatically selected with the correct IMAGE

NOTE: Verify the media if needed, but, it takes a very long time to do so.



11. Select Network and host name.

NOTE: Update server Host Name, but don't worry about networking at this time, as it will be configured later. Click **Done** after editing the host name.



8

Begin installation

Click **begin installation** to start the install.

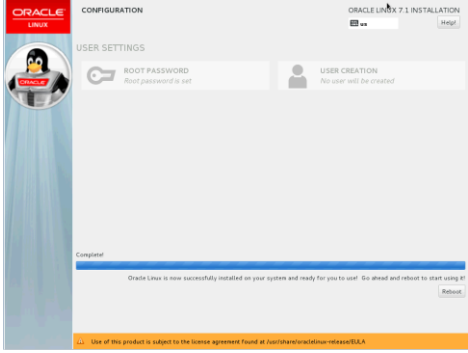
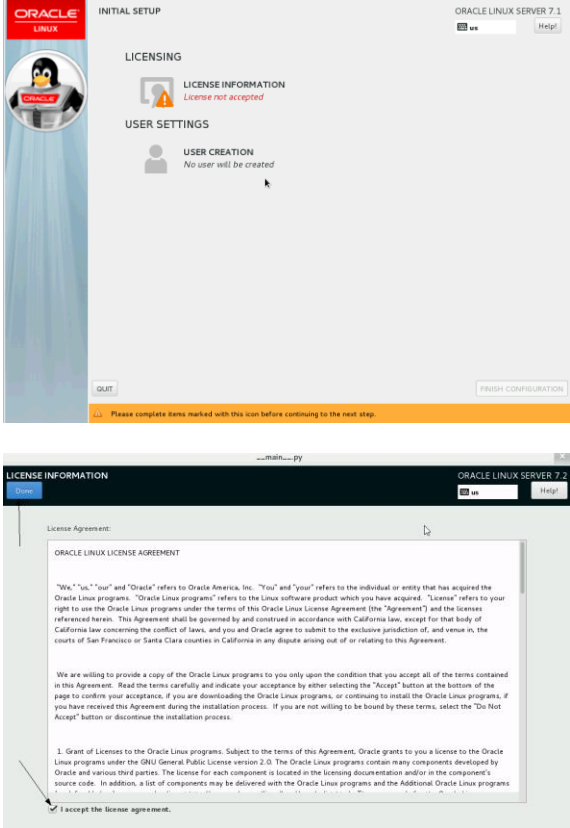


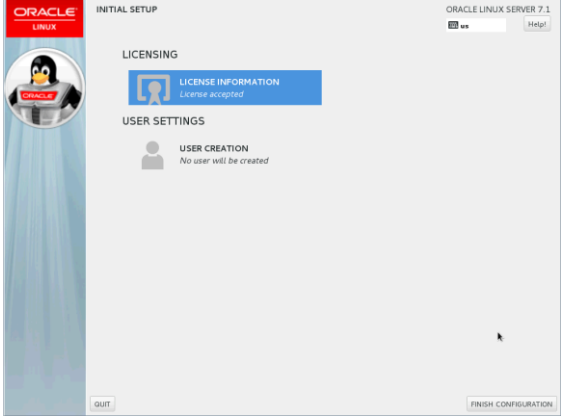
Installation will begin....

If needed, select and enter information for 'root password' and user creation.

Create an Administrative user. (NextGen)



<p>9</p>	<p>Reboot after installation</p>	<p>When OL7.x installation is complete, and you are prompted, reboot server to start OL7.x.</p> 
<p>10</p>	<p>Accept the license</p>	 <p>Then select finish installation.</p>

		
<p>11</p>	<p>Disconnect the ISO from storage</p>	<p>From KVMs→storage, select the ISO and then select disconnect.</p>
<p>12</p>	<p>Revert KVM Hypervisor host interface naming convention to ETHx</p>	<p>I. edit /etc/default/grub using vi editor</p> <pre>\$cd /etc/default \$sudo vi grub</pre> <p>II. Add the following to the <b>GRUB_CMDLINE_LINUX</b> parameter, inside the double quotes: "... rhgb quiet net.ifnames=0"</p> <pre>GRUB_TIMEOUT=5 GRUB_DISTRIBUTOR="\$(sed 's, release .*\$,,g' /etc/system-release)" GRUB_DEFAULT=saved GRUB_DISABLE_SUBMENU=true GRUB_TERMINAL_OUTPUT="console" GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=ol/root rd.lvm.lv=ol/swap rhgb quiet net.ifnames=0" GRUB_DISABLE_RECOVERY="true"</pre> <p>Recreate the grub2 config file, execute ... <code>grub2-mkconfig -o /boot/grub2/grub.cfg</code></p> <pre>[admusr@WakeForest default]\$ sudo grub2-mkconfig -o /boot/grub2/grub.cfg Generating grub configuration file ... Found linux image: /boot/vmlinuz-3.10.0-327.el7.x86_64 Found initrd image: /boot/initramfs-3.10.0-327.el7.x86_64.img Found linux image: /boot/vmlinuz-3.8.13-98.7.1.el7uek.x86_64 Found initrd image: /boot/initramfs-3.8.13-98.7.1.el7uek.x86_64.img Found linux image: /boot/vmlinuz-0-rescue-4619ece62c09419a8971fb20e8bdc1b3 Found initrd image: /boot/initramfs-0-rescue-4619ece62c09419a8971fb20e8bdc1b3.img done [admusr@WakeForest default]\$ █</pre> <p>III. Restart server, execute ... <code>shutdown -r now</code></p> <pre>[admusr@WakeForest default]\$ sudo shutdown -r now</pre> <p>After server restart, devices should be shown as ETHx.</p>

<p>13</p>	<p>Create KVM Hypervisor HOST MGMT interface</p>	<p>I. Create bond0 interface configuration file (/etc/sysconfig/network-scripts/ifcfg-bond0):</p> <pre>\$sudo vi /etc/sysconfig/network-scripts/ifcfg-bond0 DEVICE=bond0 TYPE=Bonding BOND_INTERFACES=eth0,eth1 ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none BONDING_OPTS="mode=active-backup primary=eth0"</pre> <p>II. Create eth0 interface configuration file (/etc/sysconfig/network-scripts/ifcfg-eth0):</p> <pre>\$sudo vi /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre> <p>III. Create eth1 interface configuration file (/etc/sysconfig/network-scripts/ifcfg-eth1):</p> <pre>\$sudo vi /etc/sysconfig/network-scripts/ifcfg-eth1 DEVICE=eth1 TYPE=Ethernet ONBOOT=yes NM_CONTROLLED=no BOOTPROTO=none MASTER=bond0 SLAVE=yes</pre> <p>Identify VLANs that apply for the system VM (IDIH)</p> <table border="1"> <thead> <tr> <th>VLAN NAME</th> <th>VLAN ID (example)</th> </tr> </thead> <tbody> <tr> <td>OAM/Mgt</td> <td>1982</td> </tr> </tbody> </table>	VLAN NAME	VLAN ID (example)	OAM/Mgt	1982
VLAN NAME	VLAN ID (example)					
OAM/Mgt	1982					

XMI	1983
IMI	405
INT	406

According to the architecture OAM & XMI could be a unique VLAN.

IV. Create bond0.<vlan> OAM/Mgmt interface configuration file (/etc/sysconfig/network-scripts/ifcfg-bond0.<vlan>):

```
$sudo vi /etc/sysconfig/network-scripts/ifcfg-bond0.1982
DEVICE=bond0.<vlan>
TYPE=Ethernet
ONBOOT=yes
NM_CONTROLLED=no
BOOTPROTO=none
VLAN=yes
IPADDR= <OAM/Mgmt IP>
NETMASK= <OAM/Mgmt netmask>
GATEWAY= <OAM/Mgmt gateway>
```

Save → :wq!

V. Create bond0.<vlan> OAM/Mgmt route file (/etc/sysconfig/network-scripts/route-bond0.<vlan>) default via <bond0.<vlan> gateway>

```
$sudo vi /etc/sysconfig/network-scripts/route-bond0.1982
default via 10.x.x.x.
```

Save → :wq!

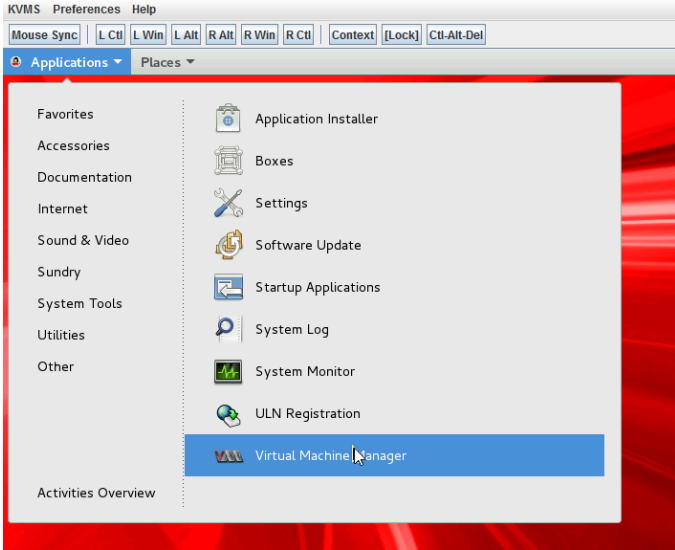
```
$sudo more route-bond0.1982
default via 10.x.x.x.
```

VI. Bring KVM hypervisor host OAM/Mgmt interfaces into service ... ifup eth0 ifup eth1 ifup bond0 ifup bond0.<vlan>

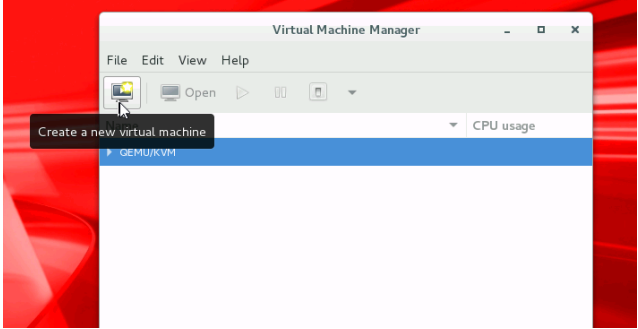
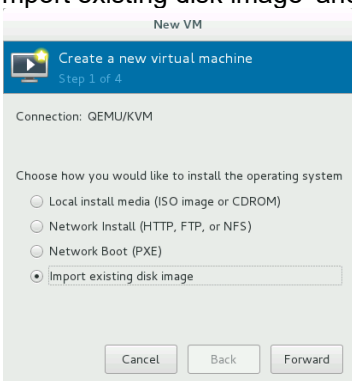
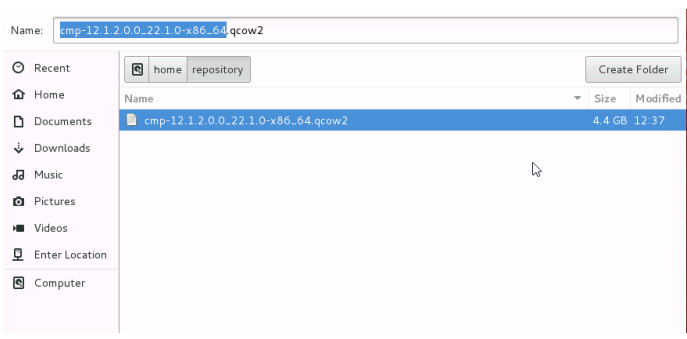
Example:

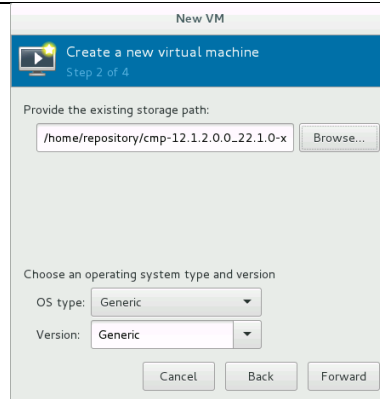
```
[admusr@WakeForest network-scripts]$ sudo ifup eth0
[admusr@WakeForest network-scripts]$ sudo ifup eth1
[admusr@WakeForest network-scripts]$ sudo ifup bond0
[admusr@WakeForest network-scripts]$ sudo ifup bond0.17
RTNETLINK answers: File exists
[admusr@WakeForest network-scripts]$
```

<p>14</p>	<p>Create interface bridges</p>	<p>I. Create XML interface bridge (/etc/sysconfig/network-scripts <b>ifcfg-br_XMI</b>):</p> <pre>\$sudo vi /etc/sysconfig/network-scripts/XMI</pre> <p>DEVICE=br_XMI</p> <p>TYPE=Bridge</p> <p>BOOTPROTO=none</p> <p>ONBOOT=yes</p> <p>NM_CONTROLLED=no</p> <p>Repeat above step for all identify interfaces. For IDIH, we need XMI,IMI and INT interfaces.</p>
<p>15</p>	<p>Create VLAN interfaces and bond them to the appropriate bridge</p>	<p>I. Create guests XML vlan interface (/etc/sysconfig/network-scripts <b>ifcfg-bond0.&lt;XMI Vlan&gt;</b>)</p> <pre>\$sudo vi /etc/sysconfig/network-scripts/ifcfg-bond0.1983</pre> <p>ONBOOT=yes</p> <p>NM_CONTROLLED=no</p> <p>BOOTPROTO=none</p> <p>VLAN=yes</p> <p>BRIDGE=XMI</p> <p>TYPE=Ethernet</p> <p>DEVICE=bond0.1983</p> <p>Repeat above step for all identify interfaces. For IDIH, we need XMI,IMI and INT interfaces.</p>
<p>16</p>	<p>Verify interfaces and Restart the network</p>	<p>Verify that all interfaces have been created with ls command</p> <pre>\$sudo ls -l /etc/sysconfig/network-scripts/</pre> <p>Example</p> <pre>[root@MXPTLM01DRA01S05KVM03 ~]# sudo ls /etc/sysconfig/network-scripts/ ifcfg-bond0      ifcfg-br_XMI      ifdown          ifdown-tunnel    ifup-routes ifcfg-bond0.1504 ifcfg-br_XSI1     ifdown-bnep     ifup              ifup-sit ifcfg-bond0.1982 ifcfg-br_XSI2     ifdown-eth      ifup-aliases     ifup-Team ifcfg-bond0.1983 ifcfg-br_XSI3     ifdown-ib       ifup-bnep        ifup-TeamPort ifcfg-bond0.405  ifcfg-br_XSI4     ifdown-ipppp    ifup-eth         ifup-tunnel ifcfg-bond0.406  ifcfg-eno1        ifdown-ipv6     ifup-ib          ifup-wireless ifcfg-bond0.74   ifcfg-eno2        ifdown-isdn     ifup-ipppp       init.ipv6-global ifcfg-bond0.75   ifcfg-eno3        ifdown-post     ifup-ipv6        network-functions ifcfg-bond0.76   ifcfg-eno4        ifdown-ppp      ifup-isdn        network-functions-ipv6 ifcfg-bond0.77   ifcfg-enp0s29ulu8c2 ifdown-routes   ifup-plip        route-bond0.1982 ifcfg-br_IDIH    ifcfg-eth0        ifdown-sit      ifup-plusb ifcfg-br_IMI     ifcfg-eth1        ifdown-Team     ifup-post ifcfg-br_SBRREP ifcfg-lo          ifdown-TeamPort ifup-ppp</pre> <p>Execute the following;</p> <pre>\$sudo service network restart</pre>

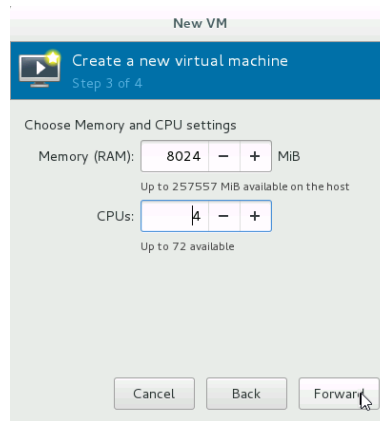
<p>17</p>	<p>Create image repository</p>	<p>Verify disk space.</p> <pre>\$df -h</pre> <p>Create an "images" directory called "repository" for IMGs and ISOs in "/home" partition</p> <pre>\$cd /home</pre> <pre>\$sudo -i</pre> <pre>\$mkdir repository</pre>
<p>18</p>	<p>Copy Image to the repository on the management server</p>	<p>Copy one of the two image types to the directory created.</p> <pre>.qcow2</pre> <p>NOTE1: The IMAGE pack for OCPM is located on the Oracle Software Delivery Site. NOTE2: Copy IDIH Oracle, Mediation and application images to the repository.</p>
<p>19</p>	<p>Launch the virtual manager from the ILOM console</p>	<p>virt-manager from the OS (virt-manager and its dependencies are included in Oracle Linux ISO and installed on the host).</p> 



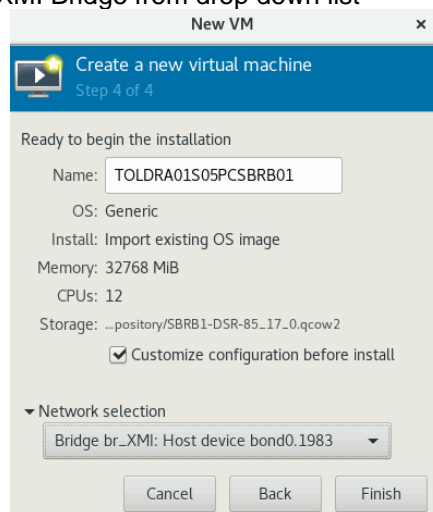
<p>20</p>	<p>Create VM</p>	<p>From the Virtual Machine Manager, select the Monitor ICON to create the new virtual machine.</p>  <p>Select 'Import existing disk image' and select forward</p>  <p>Next, select the path where the .qcow2 image resides Browse local to add the repository</p>  <p><b>OPTIONS</b>  <b>OS type = generic</b>  <b>Version = generic</b>  <b>Select forward when complete</b></p>
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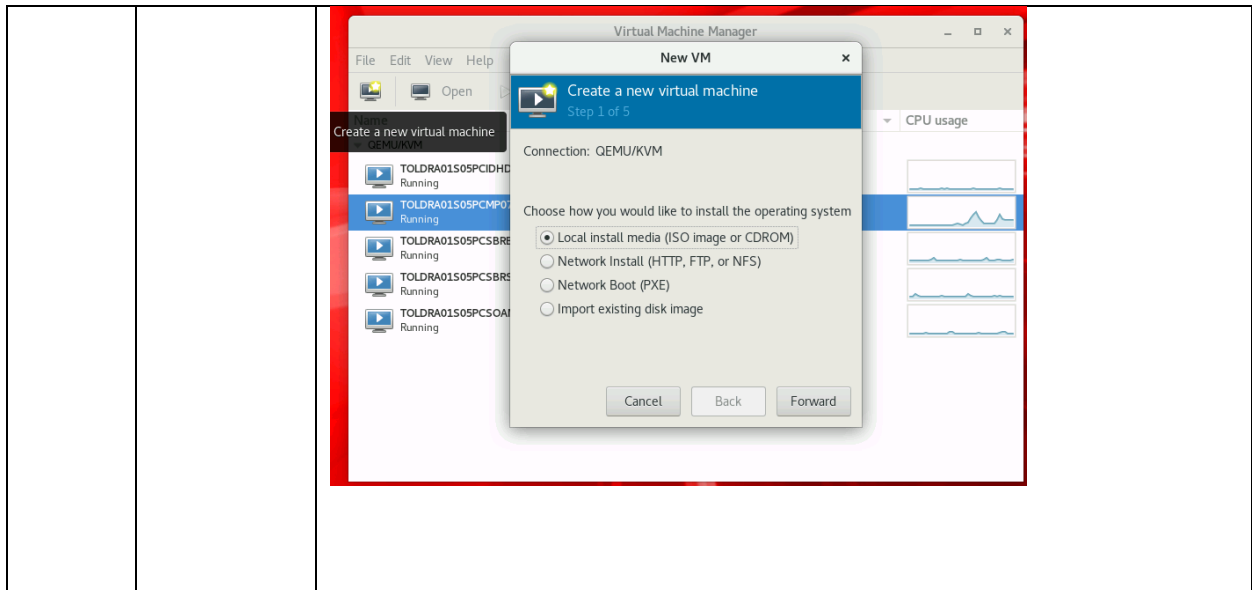
Next select the memory and CPU settings. Refers to pinning tool to setup correct information:



Name the Virtual Machine and select finish  
Choose "Customize configuration before install"  
Select XMI Bridge from drop down list



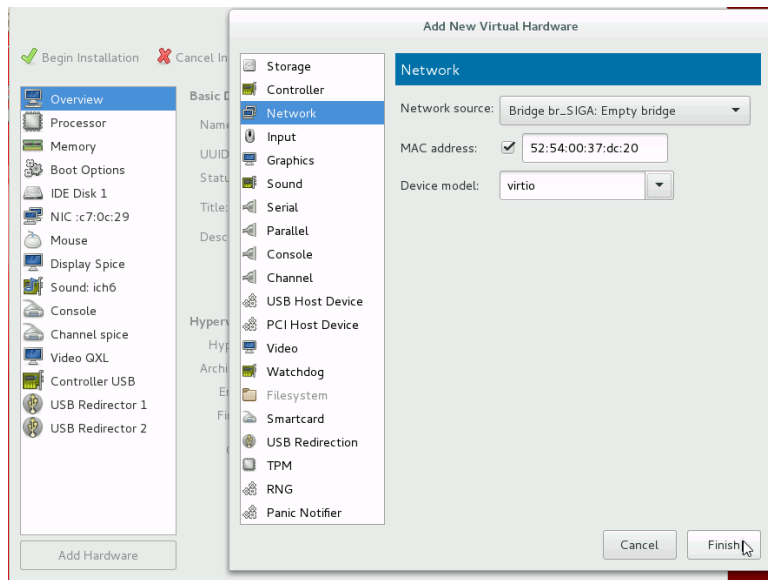
**NOTE:** In case the bridges are not listed, it is recommended to check the network parameters configured in the KVM



20

Create VMs using .qcow2 image

Click on 'Add Hardware', select "Network"



Interfaces for IDIH VMs:

Oracle: XMI and INT

Mediation: XMI, INT and IMI

Application: XMI and INT

**NOTE: Ensure that all 3 IDIH VMs are created and corresponding interfaces have been added to them (as listed above).**

IDIH VM interfaces	
XMI	eth0

IMI	eth1
IN	eth2

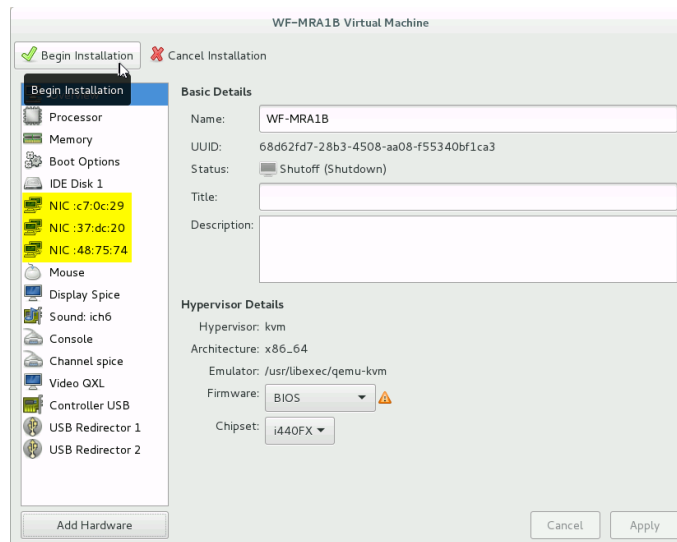
**PARAMETERS:**

Network source = XMI (select appropriate network source from the dropdown)

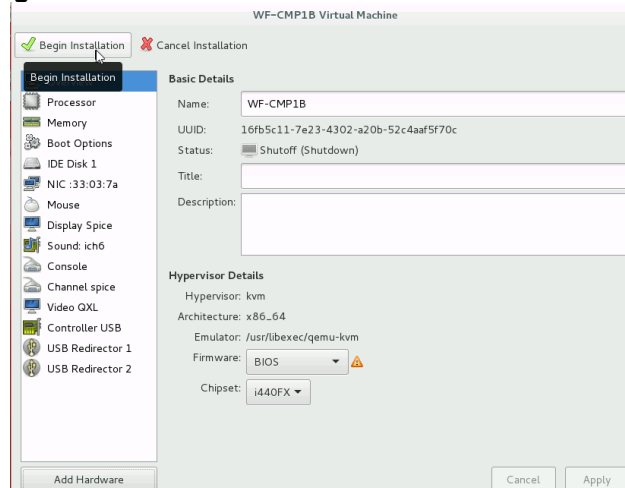
Device Model = virtio

Click **finish**.

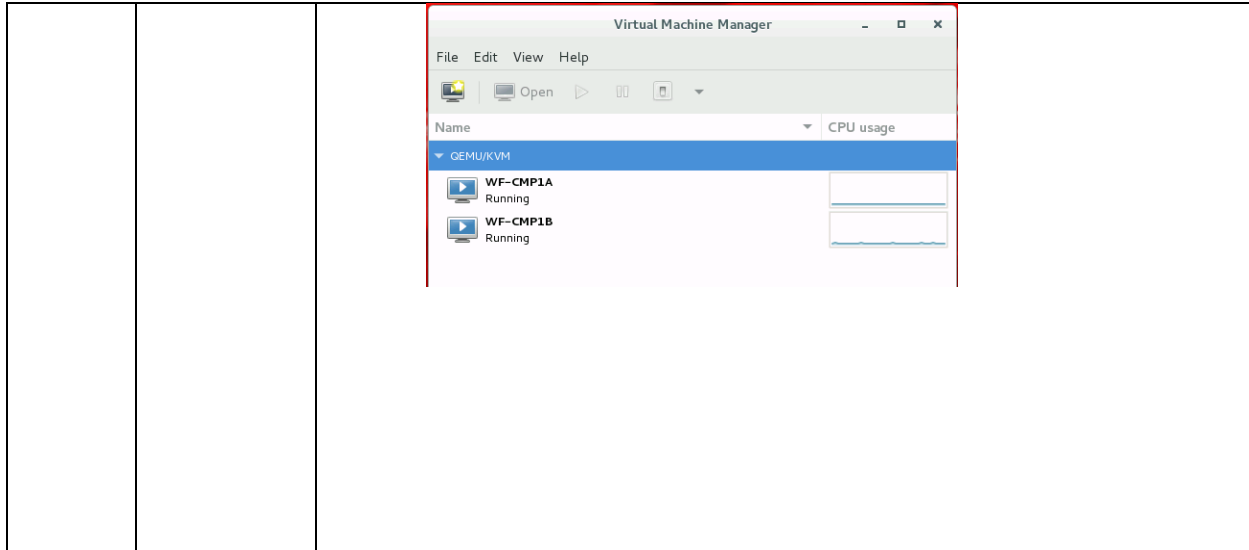
Add all interfaces as needed. After adding the other networks, you will see the NICs appear.



Click **Begin Installation**.



Installation only takes a few minutes.  
From the Virtual Machine Manager – you will see the newly created VM



### 5.10.2 Create SDB on KVM

#### Procedure 41. Create SDB on KVM

IMPORTANT: This Procedure only apply for KVM that has iDIH Database.

STEP #	Procedure	Description
1	Logon to the KVM as root.	<p>Please Log In</p> <div> <p>SP Hostname: ORACLESP-1546NM10J4</p> <p>User Name: <input type="text" value="root"/></p> <p>Password: <input type="password" value="*****"/></p> <p><input type="button" value="Log In"/></p> </div>

<p>2</p>	<p>Check partitions and disk space</p>	<p>Execute "lsblk" command</p> <pre>[root@MXTIJM01DRA01S05KVM03 admusr]# lsblk NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT sdb          8:16   1    7.5G  0 disk └─sdb1       8:17   1    3.7G  0 part    └─o100-swap 252:1   0     4G  0 lvm  [SWAP] sr0         11:0   1    4.3G  0 rom  /run/media/admusr/0L-7.6 Server.x86_64 sda          8:0    0    1.1T  0 disk ├─sda2       8:2    0  850.3G  0 part │  └─o100-swap 252:1   0     4G  0 lvm  [SWAP] │     └─o100-home 252:2   0   800G  0 lvm  /home │        └─o100-root 252:0   0    50G  0 lvm  / └─sda1       8:1    0     1G  0 part /boot</pre> <p><b>NOTE:</b> In case that sda has not free space to add a new device is recommended re-install KVM as detailed on procedure 1 (Important apply step 7)</p> <p>sda → 1TG  sda2 →850.3G  home → 800G</p> <p>Please note that the above values depend on environment where IDIH is installed. Customer's machine might have greater or lesser memory. Please adjust accordingly.</p>
<p>3</p>	<p>Create sda3</p>	<p>Execute fdisk and enter options highlighted in yellow, as detailed below:</p> <pre>[root@mxtolm01dra01s05kvm03 ~]# fdisk /dev/sda</pre> <p>Welcome to fdisk (util-linux 2.23.2).</p> <p>Changes will remain in memory only, until you decide to write them.  Be careful before using the write command.</p> <p>Command (m for help): <b>n</b></p> <p>Partition type:</p> <ul style="list-style-type: none"> <li>p primary (2 primary, 0 extended, 2 free)</li> <li>e extended</li> </ul> <p>Select (default p): <b>p</b></p> <p>Partition number (3,4, default 3): <b>3</b></p> <p>First sector (1785249792-2341795839, default 1785249792): <b>(press enter)</b></p> <p>Using default value 1785249792</p> <p>Last sector, +sectors or +size{K,M,G} (1785249792-2341795839, default 2341795839): <b>+100G</b></p> <p>Partition 3 of type Linux and of size 100 GiB is set</p>

4	Verify sda3 was created	<p>Verify sda3 config save and reboot.</p> <p>Command (m for help): p</p> <p>Disk /dev/sda: 1199.0 GB, 1198999470080 bytes, 2341795840 sectors  Units = sectors of 1 * 512 = 512 bytes  Sector size (logical/physical): 512 bytes / 512 bytes  I/O size (minimum/optimal): 512 bytes / 512 bytes  Disk label type: dos  Disk identifier: 0x000d0c0e</p> <pre> Device Boot      Start         End      Blocks   Id  System /dev/sda1  *          2048     2099199     1048576   83  Linux /dev/sda2                2099200  1785249791     891575296   8e  Linux LVM /dev/sda3    1785249792  1994964991     104857600   83  Linux </pre> <p>Command (m for help): w</p> <p>The partition table has been altered!</p> <p>Calling ioctl() to re-read partition table.</p> <p>WARNING: Re-reading the partition table failed with error 16: Device or resource busy.</p> <p>The kernel still uses the old table. The new table will be used at the next reboot or after you run partprobe(8) or kpartx(8)</p> <p>Syncing disks.</p> <p>[root@mxtolm01dra01s05kvm03 ~]# init 6</p>
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### 5.10.3 Attach device (SDA3) to iDIH Database VM

#### Procedure 42. Attach device (SDA3) to iDIH Database VM

**IMPORTANT:** This Procedure only apply to iDIH Database.

STEP #	Procedure	Description																					
1	List existing vm	<p>Excecute "virsh list --all" on KVM</p> <pre>[root@MXTIJM01DRA01S05KVM03 admusr]# virsh list --all</pre> <table border="1"> <thead> <tr> <th>Id</th> <th>Name</th> <th>State</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TIJDRA01S05PCMP07</td> <td>running</td> </tr> <tr> <td>2</td> <td>TIJDRA01S05PCMP06</td> <td>running</td> </tr> <tr> <td>3</td> <td>TIJDRA01S05PCSBRB01</td> <td>running</td> </tr> <tr> <td>4</td> <td>TIJDRA01S05PCSBRS03</td> <td>running</td> </tr> <tr> <td>6</td> <td>TIJDRA01S05PCSOAM01</td> <td>running</td> </tr> <tr> <td>7</td> <td>TIJDRA01S05PCIDHD01</td> <td>running</td> </tr> </tbody> </table>	Id	Name	State	1	TIJDRA01S05PCMP07	running	2	TIJDRA01S05PCMP06	running	3	TIJDRA01S05PCSBRB01	running	4	TIJDRA01S05PCSBRS03	running	6	TIJDRA01S05PCSOAM01	running	7	TIJDRA01S05PCIDHD01	running
Id	Name	State																					
1	TIJDRA01S05PCMP07	running																					
2	TIJDRA01S05PCMP06	running																					
3	TIJDRA01S05PCSBRB01	running																					
4	TIJDRA01S05PCSBRS03	running																					
6	TIJDRA01S05PCSOAM01	running																					
7	TIJDRA01S05PCIDHD01	running																					
2	Shutdown Oracle VM	<pre>[root@MXTIJM01DRA01S05KVM03 admusr]# virsh shutdown TIJDRA01S05PCIDHD01</pre>																					
3	Verify VM status	<p>Excecute "virsh list --all" on KVM</p> <pre>[root@MXTIJM01DRA01S05KVM03 admusr]# virsh list --all</pre> <table border="1"> <thead> <tr> <th>Id</th> <th>Name</th> <th>State</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TIJDRA01S05PCMP07</td> <td>running</td> </tr> <tr> <td>2</td> <td>TIJDRA01S05PCMP06</td> <td>running</td> </tr> <tr> <td>3</td> <td>TIJDRA01S05PCSBRB01</td> <td>running</td> </tr> <tr> <td>4</td> <td>TIJDRA01S05PCSBRS03</td> <td>running</td> </tr> <tr> <td>6</td> <td>TIJDRA01S05PCSOAM01</td> <td>running</td> </tr> <tr> <td>7</td> <td>TIJDRA01S05PCIDHD01</td> <td>shutdown</td> </tr> </tbody> </table>	Id	Name	State	1	TIJDRA01S05PCMP07	running	2	TIJDRA01S05PCMP06	running	3	TIJDRA01S05PCSBRB01	running	4	TIJDRA01S05PCSBRS03	running	6	TIJDRA01S05PCSOAM01	running	7	TIJDRA01S05PCIDHD01	shutdown
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1	TIJDRA01S05PCMP07	running																					
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4	TIJDRA01S05PCSBRS03	running																					
6	TIJDRA01S05PCSOAM01	running																					
7	TIJDRA01S05PCIDHD01	shutdown																					



4	Attach sdb to oracle vm	<p>Edit vm XML.</p> <pre>[root@MXTIJM01DRA01S05KVM03 admusr]# virsh shutdown TIJDRA01S05PCIDHD01</pre> <pre>[root@MXTIJM01DRA01S05KVM03 admusr]# virsh edit TIJDRA01S05PCIDHD01</pre> <p>The Xml will looks like this:</p> <pre>domain type='kvm'&gt; &lt;name&gt;MERDRA01S05PCIDHD01&lt;/name&gt; &lt;uuid&gt;3f5cf9bc-8790-42d7-8709-09a7dafcfd8&lt;/uuid&gt; &lt;memory unit='KiB'&gt;8388608&lt;/memory&gt; &lt;currentMemory unit='KiB'&gt;8388608&lt;/currentMemory&gt; &lt;vcpu placement='static'&gt;4&lt;/vcpu&gt; &lt;os&gt;   &lt;type arch='x86_64' machine='pc-i440fx-rhel7.0.0'&gt;hvm&lt;/type&gt;   &lt;boot dev='hd'&gt;/&gt; &lt;/os&gt; &lt;features&gt;   &lt;acpi/&gt;   &lt;apic/&gt; &lt;/features&gt; &lt;cpu mode='custom' match='exact' check='partial'&gt;   &lt;model fallback='allow'&gt;Haswell-noTSX-IBRS&lt;/model&gt; &lt;/cpu&gt; &lt;clock offset='utc'&gt;   &lt;timer name='rtc' tickpolicy='catchup'&gt;/&gt;   &lt;timer name='pit' tickpolicy='delay'&gt;/&gt;   &lt;timer name='hpet' present='no'&gt;/&gt; &lt;/clock&gt; &lt;on_poweroff&gt;destroy&lt;/on_poweroff&gt; &lt;on_reboot&gt;restart&lt;/on_reboot&gt; &lt;on_crash&gt;destroy&lt;/on_crash&gt; &lt;pvm&gt;   &lt;suspend-to-mem enabled='no'&gt;/&gt;   &lt;suspend-to-disk enabled='no'&gt;/&gt; &lt;/pvm&gt; &lt;devices&gt;   &lt;emulator&gt;/usr/libexec/qemu-kvm&lt;/emulator&gt;   &lt;disk type='file' device='disk'&gt;     &lt;driver name='qemu' type='qcow2'&gt;/&gt;     &lt;source file='/home/repository/ORA-82_32_0.qcow2'&gt;/&gt;     &lt;target dev='hda' bus='ide'&gt;/&gt;     &lt;address type='drive' controller='0' bus='0' target='0' unit='0'&gt;/&gt;   &lt;/disk&gt;   &lt;controller type='usb' index='0' model='ich9-ehci1'&gt;</pre> <p>Insert below lines in the xml file (after existing disk --second last line in the above image)</p> <pre>&lt;disk type='block' device='disk'&gt; &lt;driver name='qemu' type='raw'&gt; &lt;source dev='/dev/sda3'&gt; &lt;target dev='hdc' bus='scsi'&gt; &lt;address type='drive' controller='0' bus='0' target='0' unit='1'&gt; &lt;/disk&gt;</pre> <p>Save changes with :wq! Command</p> <p>Domain TIJDRA01S05PCIDHD01 XML configuration edited.</p>
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## 5.10.4 Resize ORA (database) ova Image on KVM

### Procedure 43. Resize ORA (database) ova image on KVM

IMPORTANT: This Procedure only apply to iDIH Database.

STEP #	Procedure	Description
1	Resize ova from KVM to 120G	Execute below commands <pre>cd /home/repository/ qemu-img resize &lt;image_name.qcow2&gt; +&lt;New_Size&gt;  cd /home/repository qemu-img resize ORA-82_32_0.qcow2 +56G</pre>
2	Verify virtual size	Apply command → virtual size: 120G  <pre>[root@MXMERM01DRA01S05KVM03 repository]# qemu-img info ORA-82_32_0.qcow2  image: ORA-82_32_0.qcow2 file format: qcow2 virtual size: 120G (68719476736 bytes) disk size: 20G cluster_size: 65536  Format specific information:   compat: 1.1   lazy refcounts: false  [root@MXMERM01DRA01S05KVM03 repository]#</pre>
3	Initiate VM	Start VM  <pre>[root@MXTIJM01DRA01S05KVM03 admusr]# virsh start TIJDRA01S05PCIDHD01</pre>
4	Validate sdb is attached to VM	Login on Database VM  <pre>\$sudo df -h</pre>

## 5.10.5 Fix iDIH Database Script on KVM

### Procedure 44. Fix iDIH Database Script on KVM

IMPORTANT: This Procedure only apply to iDIH database over KVM (Not Openstack/KVM).

STEP #	Procedure	Description
1	Edit Script	<p>Edit ASMSteup file</p> <pre> sudo vi /opt/xiH/oracle/instances/ASMSetup </pre> <p>Locate line 94, modify the expression <b>^vd</b> by <b>^sd</b> and save</p> <pre> 76         fi 77     fi 78 79     # search all the virtual drives 80     log "Searching for virtual drives..." 81     for vmDrive in /dev/[sv]d[bcdefg] 82     do 83         # 84         # To it a block device: 85         if [ -b "\$vmDrive" ] 86         then 87             # 88             # set just the file name to store: 89             vmDrive=\$(SBASENAME_CMD \$vmDrive) 90 91             # 92             # On on KVM hardware we don't want anything but vdx drives: 93             [[ \$hwType == "KVM" &amp;&amp; ! \$vmDrive =~ ^s\$ ]] &amp;&amp; continue 94 95             # 96             # We don't want to add a rule for a device that is actually in the fstab. 97             # [XX] Is this still a real problem? 98             grep_CMD -q "\$vmDrive" /etc/fstab &amp;&amp; continue 99 100            # 101            # Store it: 102            device="\$device \$vmDrive" 103        fi 104    done </pre> <p>Save :wq!</p>
2	iDIH DB Installation	<p>Follow the steps in procedure 35 and procedure 36 in DSR 8.5 Cloud Installation guide w.r.t Oracle VM configuration and post installation.</p>
3	Check iDIH DB Installation	<p>Check that partitions were mounted as expected before proceed with Mediation and Application Installation</p> <pre> [root@TLADRA01S02MMIDHD01 ~]# lsblk NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT sda ├─sda1      8:1  0  512M 0 part /boot ├─sda2      8:2  0  63.5G 0 part ├─vgroot-plat_root (dm-0) 253:0 0  10G 0 lvm / ├─vgroot-plat_var (dm-1)  253:1 0   1G 0 lvm /var ├─vgroot-plat_usr (dm-2)  253:2 0   4G 0 lvm /usr ├─vgroot-plat_tmp (dm-3)  253:3 0   2G 0 lvm /tmp ├─vgroot-plat_var_tk1c (dm-4) 253:4 0   8G 0 lvm /var/TK1C ├─vgroot-oracle (dm-5)   253:5 0  25G 0 lvm /u01/app ├─vgroot-plat_swap (dm-6) 253:6 0   8G 0 lvm [SWAP] └─vgroot-external0 (dm-7) 253:7 0   3G 0 lvm sdb         8:16  0  100G 0 disk </pre> <pre> [root@TLADRA01S02MMIDHD01 ~]# fdisk -l Disk /dev/sda: 128.8 GB, 128849018880 bytes 255 heads, 63 sectors/track, 15665 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x000c35df     Device Boot      Start         End      Blocks   Id  System /dev/sda1 *           1           66       524288   83  Linux Partition 1 does not end on cylinder boundary. /dev/sda2             66        8355     66583552   8e  Linux LVM  Disk /dev/sdb: 107.4 GB, 107374182400 bytes 255 heads, 63 sectors/track, 13054 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x00000000 </pre>
4	iDIH Med & App Installation	<p>Follow the steps in procedure 35 and procedure 36 in DSR 8.5 Cloud Installation guide w.r.t Mediation and application VM configuration and post installation.</p>

<p>5</p>	<p>Verification of DB Tables</p>	<p>Verify that information highlighted on yellow is similar to showed values</p> <pre>[admusr@APODRA01S05PCIDHD01 ~]\$ sudo -i [root@APODRA01S05PCIDHD01 ~]# su - oracle [oracle@APODRA01S05PCIDHD01 ~]\$ sqlplus /@NSP; SQL&gt; select count(*) from tab; <b>183</b> [oracle@APODRA01S05PCIDHD01 ~]\$ sqlplus /@IXP; SQL&gt; select count(*) from tab; <b>63</b> [admusr@APODRA01S05PCIDHD01 ~]\$ sudo su - grid [grid@APODRA01S05PCIDHD01 ~]\$ sqlplus / as sysasm SQL&gt; select group_number, name, state, type from v\$asm_diskgroup;</pre>																																																																													
<p>6</p>	<p>Check View TbspceUsage.sh on MED VM</p>	<p>Verify that information was transfer from DATA1 to DATA</p> <ul style="list-style-type: none"> <li>• DATA1 must have 9% usage or similar</li> <li>• DATA must have 7% usage or similar</li> </ul> <pre>[root@APODRA01S04PCIDHM01 ~]# su - tekelec cd /usr/TKLC/xIH/mediation/xdrDbInstall/utils/cmd ./ViewTbspceUsage.sh /@NSP</pre> <table border="1"> <thead> <tr> <th>Tablespace</th> <th>Used (MB)</th> <th>Alloc (MB)</th> <th>Max (MB)</th> <th>Used/Max %</th> </tr> </thead> <tbody> <tr><td>APPS_REFDATA</td><td>7</td><td>50</td><td>16384</td><td>0</td></tr> <tr><td>DATA_CDR</td><td>68</td><td>600</td><td>35840</td><td>0</td></tr> <tr><td>DATA_CONF</td><td>9</td><td>50</td><td>2048</td><td>0</td></tr> <tr><td>DATA_IND</td><td>68</td><td>550</td><td>6144</td><td>1</td></tr> <tr><td>NSP_CACHE</td><td>7</td><td>50</td><td>4096</td><td>0</td></tr> <tr><td>NSP_CONF</td><td>39</td><td>50</td><td>4096</td><td>1</td></tr> <tr><td>NSP_DATA</td><td>8</td><td>50</td><td>2048</td><td>0</td></tr> <tr><td>NSP_EXPT</td><td>7</td><td>50</td><td>50</td><td>16</td></tr> <tr><td>NSP_LOG</td><td>33</td><td>50</td><td>2048</td><td>2</td></tr> <tr><td>SYSAUX</td><td>456</td><td>500</td><td>4096</td><td>11</td></tr> <tr><td>SYSTEM</td><td>326</td><td>400</td><td>4096</td><td>8</td></tr> <tr><td>UNDO</td><td>55</td><td>300</td><td>8192</td><td>1</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th>DISKGROUPNAME</th> <th>DiskUsage (MB)</th> <th>Total (MB)</th> <th>Used %</th> </tr> </thead> <tbody> <tr><td>DATA1</td><td>268</td><td>3072</td><td><b>9</b></td></tr> <tr><td>DATA</td><td>6872</td><td>102400</td><td><b>7</b></td></tr> </tbody> </table>	Tablespace	Used (MB)	Alloc (MB)	Max (MB)	Used/Max %	APPS_REFDATA	7	50	16384	0	DATA_CDR	68	600	35840	0	DATA_CONF	9	50	2048	0	DATA_IND	68	550	6144	1	NSP_CACHE	7	50	4096	0	NSP_CONF	39	50	4096	1	NSP_DATA	8	50	2048	0	NSP_EXPT	7	50	50	16	NSP_LOG	33	50	2048	2	SYSAUX	456	500	4096	11	SYSTEM	326	400	4096	8	UNDO	55	300	8192	1	DISKGROUPNAME	DiskUsage (MB)	Total (MB)	Used %	DATA1	268	3072	<b>9</b>	DATA	6872	102400	<b>7</b>
Tablespace	Used (MB)	Alloc (MB)	Max (MB)	Used/Max %																																																																											
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7	Execute steps in Procedure 37 and Procedure 39 of DSR 8.5 Cloud Installation guide	<p>Procedure: Configure DSR Reference Data Synchronization for iDIH</p> <p>Procedure: Integrate iDIH into DSR</p>
8	Other Optional Steps	<p>There are few more IDIH procedures in DSR 8.5 cloud installation guide which are optional and may be followed if there is a requirement in customer environment</p> <p>Procedure: iDIH Configuration: Configuring the SSO Domain</p> <p>Procedure: iDIH Configuration: Configure the Mail Server</p> <p>Procedure: iDIH Configuration: Configure SNMP Management Server</p> <p>Procedure: iDIH Configuration: Change Network Interface</p>

### 5.11 Post iDIH Installation Configuration (Optional)

#### Procedure 45. Run Post Installation Scripts on iDIH VMs (Optional)

STEP #	Procedure	Description
<p>This procedure runs post installation scripts on the iDIH VMs.</p> <p><b>Prerequisite:</b> Procedure 5 has been completed.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
<p>1.</p> <p><input type="checkbox"/></p>	<p>Log into the iDIH Oracle VM Console</p>	<p>1. Access the iDIH Oracle VM console.</p> <p>2. Login as the <b>admusr</b> user.</p>

STEP #	Procedure	Description
2. <input type="checkbox"/>	Run the iDIH Oracle post installation script	<ol style="list-style-type: none"> <li>1. Wait for the software upgrades to complete on all iDIH VMs. <b>Note:</b> Verify the /etc/hosts file before, and after the execution of the script configureOracle.sh, having internal IP address for all the three guests.</li> <li>2. As <b>admusr</b> on the <b>iDIH Oracle VM</b> console, run the Oracle post installation script.   <pre>\$ sudo /opt/xIH/oracle/configureOracle.sh</pre> <b>Note:</b> The Oracle post installation script runs for 5 to 15 minutes depending on the Oracle version and patch level. Wait for it to complete before the next step is executed. Once the script execution is over, it will come out without any message.   <b>Note:</b> To verify the install status, check the /var/TKLC/xIH/log/oracle/post_image_install.log file for any errors. The error stating: <b>Cannot use backup/restore functions while using dispatcher</b> can safely be ignored.</li> </ol>
3. <input type="checkbox"/>	Log into the iDIH Mediation VM Console as admusr	<ol style="list-style-type: none"> <li>1. Access the <b>iDIH Mediation VM</b> console.</li> <li>2. Login as the <b>admusr</b> user.</li> </ol>

STEP #	Procedure	Description
<p>4.</p> <input type="checkbox"/>	<p>Run the iDIH Mediation VM post installation script</p>	<p>The Oracle post installation script must come to completion before the Mediation post installation script is run.</p> <ol style="list-style-type: none"> <li>As the <b>admusr</b> user on the <b>iDIH Mediation VM</b> console, run the Mediation post installation script. <pre>\$ sudo /opt/xIH/mediation/install.sh</pre> <p><b>Note:</b> The Mediation post installation script runs for 2 to 10 minutes. Wait for it to complete before the next step is executed. To verify the install status, check the <code>/var/TKLC/xIH/log/mediation/post_image_install.log</code> file for any errors.</p> <p><b>Note:</b> It is assumed network configuration and functionality is correct before installation. If you encounter an issue of the mediation post installation script <code>/opt/xIH/mediation/install.sh</code> hanging at the beginning as shown below, but you are still able to ssh to <b>Oracle VM</b> using internal IP, make sure the internal interface (int) MTU has the correct setting - 1500 MTU. If yes, MTU size adjustment may be needed. For verification, connect to oracle using sqlplus using the following commands:</p> <ol style="list-style-type: none"> <li>Log into the Mediation server as <b>admusr</b>.</li> <li>Execute the command <b>sudo su - tekelec</b>.</li> <li>Execute the command <b>sqlplus /@NSP</b>.</li> </ol> </li> <li>As <b>tekelec</b> on the <b>iDIH Mediation VM</b> console, run the following commands: <pre>\$ sudo su - tekelec</pre> <pre>\$ iset -fnodeName='hostname' -fhostName='hostname' NodeInfo where 1=1</pre> <p><b>Note:</b> Replace hostname with the actual hostname of Mediation VM.</p> </li> </ol>
<p>5.</p> <input type="checkbox"/>	<p>Log into the iDIH application VM console as admusr</p>	<ol style="list-style-type: none"> <li>Access the iDIH Application VM console.</li> <li>Login as the <b>admusr</b> user.</li> </ol>
<p>6.</p> <input type="checkbox"/>	<p>Run the iDIH Application post installation script</p>	<p>The Mediation post installation script must come to completion before the Application post installation script is run.</p> <p>As the <b>admusr</b> user on the <b>iDIH Application VM</b> console, run the Application post installation script.</p> <pre>\$ sudo /opt/xIH/apps/install.sh</pre> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>The application post installation script runs for 2 to 10 minutes. Wait for it to complete before executing the next step.</li> <li>Verify the <code>/etc/hosts</code> file before, and after the execution of the script <code>configureOracle.sh</code>, having internal IP address for all the three guests.</li> </ul>

STEP #	Procedure	Description
7. <input type="checkbox"/>	Run the iDIH health check script on each of the iDIH VMs	<p>Once all of the iDIH VMs have restarted. Run the health check scripts on each iDIH VM.</p> <ol style="list-style-type: none"> <li>As the <b>admusr</b> user on the <b>iDIH Oracle VM</b> console, run the <b>health check script</b> and verify the results. Ignore the NTP message stating the <b>tvoe-host is not integrated</b>.</li> </ol> <pre>\$ sudo /usr/TKLC/xIH/plat/bin/analyze_server.sh -i</pre> <ol style="list-style-type: none"> <li>As <b>admusr</b> on the <b>iDIH Application VM</b> console, run the <b>health check script</b> and verify the results. Ignore the NTP message stating <b>tvoe-host is not integrated</b>.</li> </ol> <pre>\$ sudo /usr/TKLC/xIH/plat/bin/analyze_server.sh -i</pre> <ol style="list-style-type: none"> <li>As <b>admusr</b> on the <b>iDIH Mediation VM</b> console, run the <b>health check script</b> and verify results. Ignore the NTP message stating tvoe-host is not integrated.</li> </ol> <pre>\$ sudo /usr/TKLC/xIH/plat/bin/analyze_server.sh -i</pre> <p><b>Note:</b> Ignore NTP message stating the <b>tvoe-host is not integrated</b>.</p>

**Procedure 46. Configure DSR Reference Data Synchronization for iDIH (Optional)**

STEP #	Procedure	Description
<p>This procedure configures DSR reference data synchronization for iDIH.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>		
1. <input type="checkbox"/>	<b>iDIH Application Server:</b> Login	<ol style="list-style-type: none"> <li>Establish an SSH session to the iDIH Application Server.</li> <li>Login as the <b>admusr</b> user.</li> <li>Issue the following command to login as a <b>tekelec</b> user.</li> </ol> <pre>\$ sudo su - tekelec</pre>
2. <input type="checkbox"/>	<b>iDIH Application Server:</b> Execute configuration script	<ol style="list-style-type: none"> <li>Execute the following script using SOAM VIP address: <code>Apps/trda-config.sh</code></li> </ol> <p><b>Note:</b> The SO IP address to be used here is the internal xmi address of the SO and not the floating-ip or external address (if used any).</p> <p>Example output:</p> <pre>corsair-app:/usr/TKLC/xIH apps/trda-config.sh dos2unix: converting file /usr/TKLC/xIH/boa/user_projects/domains/tekelec/nsp/trace-refdata-ad Please enter DSR oam server IP address: 10.240.39.175 SQL*Plus: Release 12.1.0.2.0 Production on Thu Oct 1 15:04:40 2015 Copyright (c) 1982, 2014, Oracle. All rights reserved.</pre>




STEP #	Procedure	Description
		<pre> Last Successful login time: Thu Oct 01 2015 13:27:57 - 04:00  Connected to:  Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production  With the Partitioning, Automatic Storage Management, OLAP, Advanced Analytics and Real Application Testing options  SQL&gt; SQL&gt; 2 3 4 5  1 row merged.  SQL&gt;  Commit complete.  SQL&gt; Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Produ  With the Partitioning, Automatic Storage Management, OLAP, Advanced Analytics and Real Application Testing options  Buildfile: /usr/TKLC/xIH/apps/trace-refdata- adapter/build.xml  app.disable: common.weblogic.stop:      [echo]     [echo]     [echo] =====      [echo] application: xihtra     [echo] date:    2015-10-01 15:04:41     [echo] =====      [echo] === stop application EAR     [echo] date:    2015-10-01 15:04:41      [java] weblogic.Deployer invoked with options: - adminurl t3://appserver:7001 - userconfigprojects/domains/tekelec/keyfile.secure -name xIH Trace Reference Data Adapter -stop      [java] &lt;Oct 1, 2015 3:05:08 PM EDT&gt; &lt;Info&gt; &lt;J2EE Deployment SPI&gt; &lt;BEA-260121&gt; &lt;Initiating      [java] Task 24 initiated: [Deployer:149026]stop application xIH Trace Reference Data Adap      [java] Task 24 completed: [Deployer:149026]stop application xIH Trace Reference Data Adap      [java] Target state: stop completed on Server nsp </pre>

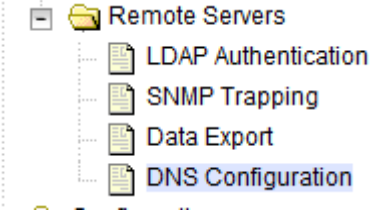
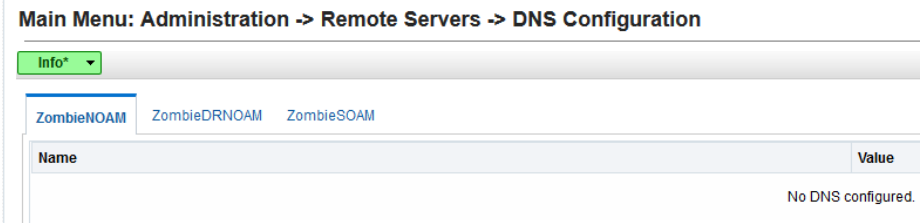
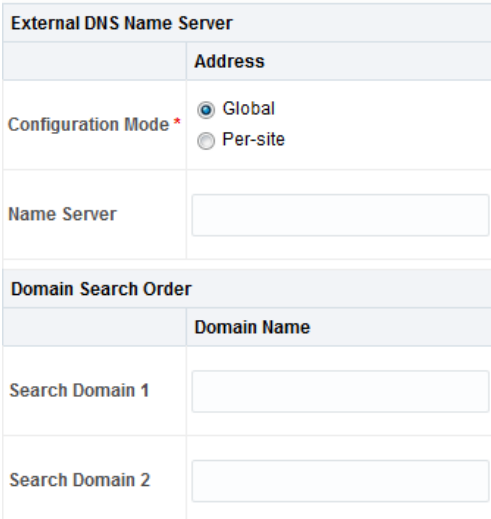
STEP #	Procedure	Description
		<pre> [java] BUILD SUCCESSFUL Total time: 29 seconds Buildfile: /usr/TKLC/xIH/apps/trace-refdata- adapter/build.xml app.enable: common.weblogic.start: [echo] [echo] [echo] ===== [echo] application: xihtra [echo] date:    2015-10-01 15:05:10 [echo] ===== [echo] === start application EAR [echo] date:    2015-10-01 15:05:10 [java] weblogic.Deployer invoked with options: - adminurl t3://appserver:7001 - userconfigprojects/domains/tekelec/keyfile.secure -name xIH Trace Reference Data Adapter -start [java] &lt;Oct 1, 2015 3:05:56 PM EDT&gt; &lt;Info&gt; &lt;J2EE Deployment SPI&gt; &lt;BEA-260121&gt; &lt;Initiating [java] Task 25 initiated: [Deployer:149026]start application xIH Trace Reference Data Ada [java] Task 25 completed: [Deployer:149026]start application xIH Trace Reference Data Ada [java] Target state: start completed on Server nsp [java] BUILD SUCCESSFUL Total time: 1 minute 17 seconds 2. When asked to <b>Please enter DSR OAM server IP address</b>, type the <b>VIP</b> of the DSR SOAM (or active DSR SOAM if VIP is not available) and click <b>Enter</b>. <b>Note:</b> If the address typed is unreachable, the script exits with error <b>Unable to connect to &lt;ip-address&gt;!</b> </pre>
<p>3. <input type="checkbox"/></p>	<p><b>iDIH Application Server:</b> Monitor completion</p>	<p>1. Monitor the log file located at: <code>/var/TKLC/xIH/log/apps/weblogic/apps/application.log</code></p> <p>2. Examine the log file for entries containing text <b>Trace Reference Data Adapter</b>.</p>

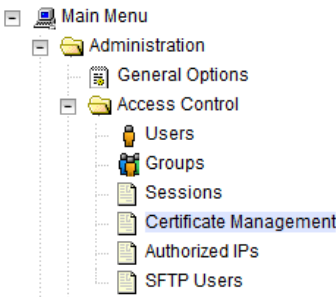

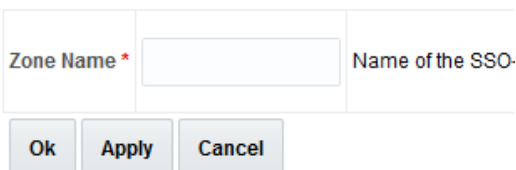
STEP #	Procedure	Description
<p>4. <input type="checkbox"/></p>	<p><b>iDIH Application Server</b> (Optional): Switch iDIH from one DSR to another DSR in a different network</p>	<p><b>Note:</b> This is an optional step which is needed to switch an iDIH from one DSR to another DSR in a different network</p> <ol style="list-style-type: none"> <li>1. Establish an SSH session to the iDIH Application Server.</li> <li>2. Login as the <b>tekelec</b> user</li> <li>3. Execute these commands:                             <ol style="list-style-type: none"> <li>a. <code>cd /usr/TKLC/xIH/apps/trace-refdata-adapter</code></li> <li>b. <code>ant clean.data</code></li> <li>c. <code>cd /usr/TKLC/xIH/apps/xihoam</code></li> <li>d. <code>ant imp.init</code> (flush comagent connection data)</li> <li>e. <code>cd /usr/TKLC/xIH/apps/trace-refdata-adapter</code></li> <li>f. <code>ant app.enable</code> (Sync MOs from SOAM )</li> <li>g. <code>cd /usr/TKLC/xIH/apps</code></li> <li>h. <code>./trda-config.sh &lt;DSR SOAM VIP in different network&gt;</code></li> </ol> </li> </ol>

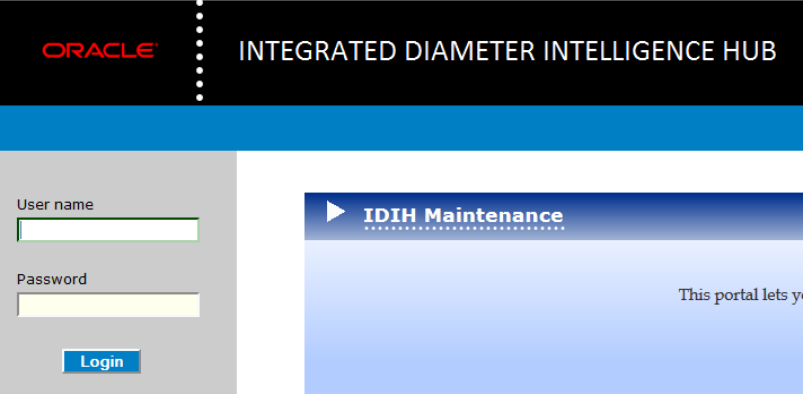
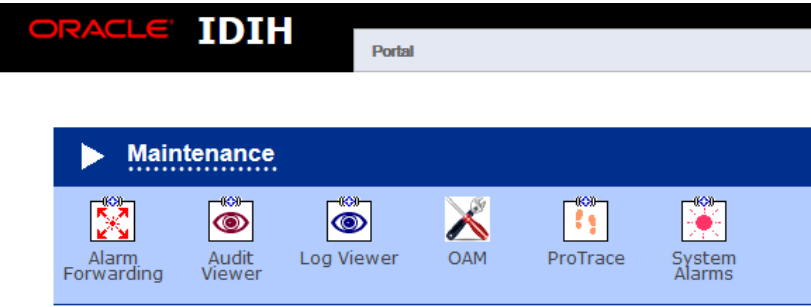
**Procedure 47. iDIH Configuration: Configuring the SSO Domain (Optional)**

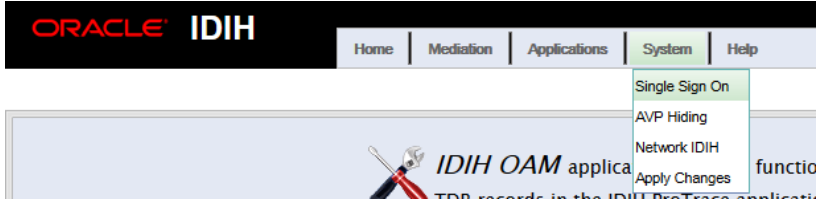
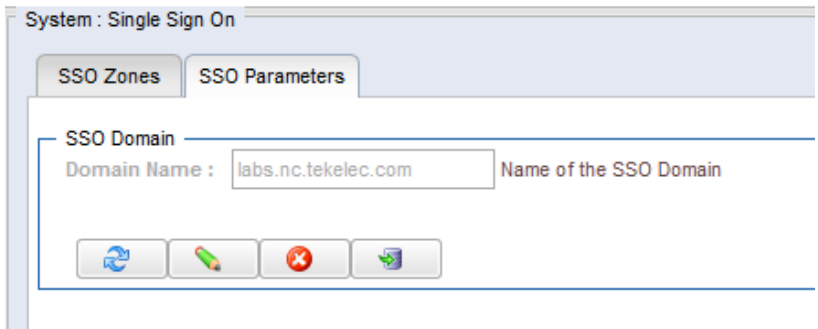
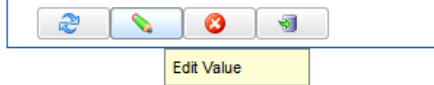

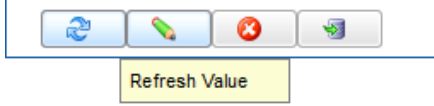
STEP #	Procedure	Description
		<p>This procedure configures the SSO domain for iDIH.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>

STEP #	Procedure	Description
<p>1. <input type="checkbox"/></p>	<p><b>NOAM VIP GUI: Login</b></p>	<p>1. Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and type <b>https://&lt;Primary_NOAM_VIP_IP_Address&gt;</b> as the URL.</p> <p>2. Login as the <b>admusr</b> user.</p> <div style="text-align: center;">  </div>

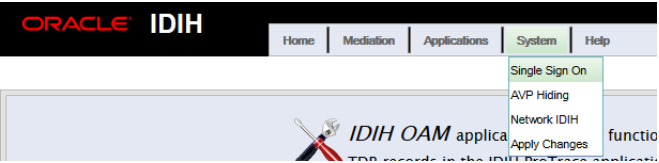
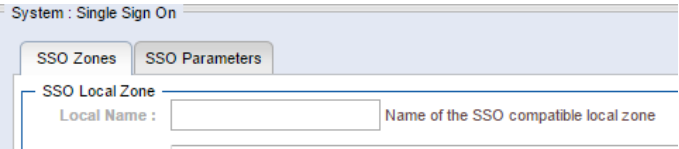
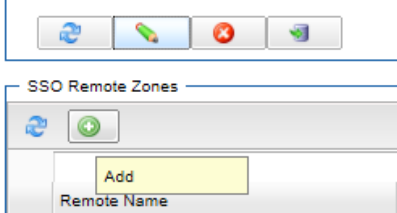
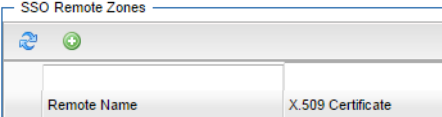
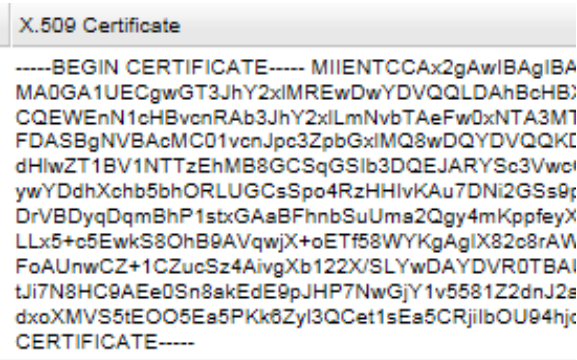


STEP #	Procedure	Description
<p>2.</p> <p><input type="checkbox"/></p>	<p><b>NOAM VIP GUI:</b> Configure DNS</p>	<p>1. Navigate to <b>Administration &gt; Remote Servers &gt; DNS Configuration</b>.</p>  <p>2. Select the NOAM tab.</p>  <p>3. Configure values for the following fields:</p> <ul style="list-style-type: none"> <li>Domain Name</li> <li>Name Server</li> <li>Search Domain 1</li> </ul>  <p>4. If values have already been configured, click <b>Cancel</b>; otherwise configure the values and click <b>OK</b>.</p> <p><input type="button" value="Ok"/> <input type="button" value="Cancel"/></p>

STEP #	Procedure	Description
<p>3.</p> <p><input type="checkbox"/></p>	<p><b>NOAM VIP GUI:</b> Establish SSO local zone</p>	<p>1. Navigate to <b>Access Control &gt; Certification Management</b>.</p>  <p>2. Click <b>Establish SSO Zone</b>.</p>  <p>3. Type a value for <b>Zone Name</b>.</p>  <p>4. Click <b>OK</b>. Information for the new certificate type of SSO local displays.</p> <p>5. Click <b>Report</b>.</p>  <p>6. The Certificate Report displays. Select and copy the encoded certificate text to the clipboard for future access.</p> <p>Example of Certificate Report:</p> <pre> -----BEGIN CERTIFICATE----- MIICKzCCAdWgAwIBAgIJAOVfSLNc3CeJMA0GCSqGSIb3DQEBCwUAMHExCzAJBgNV BAYTA1VTMQswCQYDVQQIDAJQzEQMA4GA1UEBwwHUWFSZWlnaDEPMA0GA1UECgwG T3JhY2x1MQswCQYDVQQLEDAJQVJvJEQMA4GA1UEAwwHTG1iZXJ0eTETMBEGCSqGSIb3 DQEJARYEdGVzdDAeFw0xNTA1MDQxNDIzNTRaFw0xNjA1MDMxNDIzNTRaMHExCzAJ BgNVBAYTA1VTMQswCQYDVQQIDAJQzEQMA4GA1UEBwwHUWFSZWlnaDEPMA0GA1UE CgwGT3JhY2x1MQswCQYDVQQLEDAJQVJvJEQMA4GA1UEAwwHTG1iZXJ0eTETMBEGCSqG SIb3DQEJARYEdGVzdDBcMA0GCSqGSIb3DQEBAQUAA0sAMEgCQCZ/MpkhlvMP/iJ s5xDO2MwxJm3jYim43H8gR9pfBTMNP6L9kluJYi+2T0hngJFQLpIn6SK6pXnuAGY f/vDwfqPAGMBAAGjUDBOMB0GA1UdDgQWBBS6IzIOLP1gizQ6+BERr8Fo2XyDVDAf BgNVHSMEGDAWBS6IzIOLP1gizQ6+BERr8Fo2XyDVDAwBgNVHRMEBTADAQH/MA0G CSqGSIb3DQEBCwUAA0EAOWIqBMEQyvfvt38r/yfgIx3w5dN8SBwHjHC5TpJrHV6U zFlg5dfzoLz7ditjGohWJ919VRw39LQ81KFp7SMXwA== -----END CERTIFICATE----- </pre>

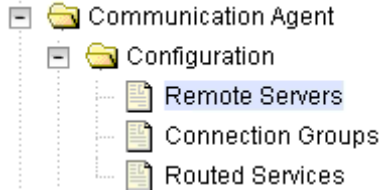

STEP #	Procedure	Description
<p>4.</p> <p><input type="checkbox"/></p>	<p><b>iDIH Application Server GUI: Login</b></p>	<p>1. Establish a GUI session on the iDIH application server, using the xmi IP address:</p> <p><a href="https://&lt;app server IP&gt;">https://&lt;app server IP&gt;</a></p> <p>2. Login as the idihadmin user.</p> 
<p>5.</p> <p><input type="checkbox"/></p>	<p><b>iDIH Application Server GUI: Launch the OAM portal</b></p>	<p>Navigate to the OAM portal icon to start the OAM web application.</p> 

STEP #	Procedure	Description
<p>6.</p> <p><input type="checkbox"/></p>	<p><b>IDIH Application Server GUI:</b> Configure the SSO domain</p>	<p>1. Navigate to <b>System &gt; Single Sign On.</b></p>  <p>Select the <b>SSO Parameters</b> tab.</p>  <p>2. Click the <b>Edit Value</b> icon.</p>  <p>3. Type a value for the <b>Domain Name</b>.</p> <p><b>Note:</b> This should be the same domain name assigned in the DSR NOAM DNS Configuration (step 2).</p> <p>4. Click the <b>Save</b> icon.</p>  <p>5. Click the <b>Refresh</b> icon to display data saved for the remote zone.</p> 

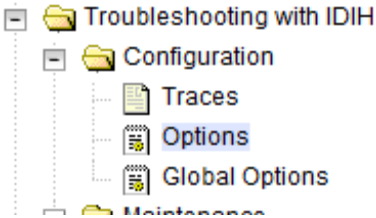
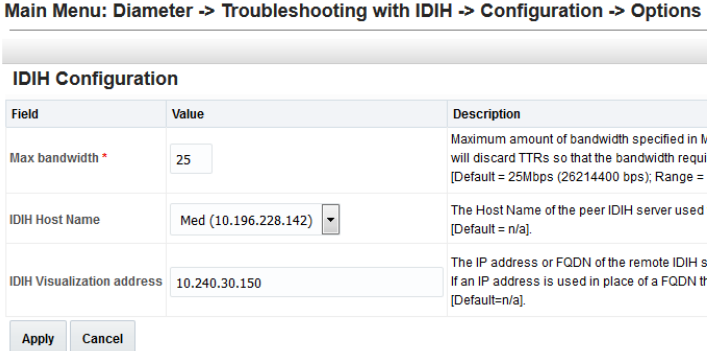


STEP #	Procedure	Description
<p>7.</p> <p><input type="checkbox"/></p>	<p><b>IDIH Application Server GUI:</b> Configure the SSO Remote Zone</p>	<ol style="list-style-type: none"> <li>Navigate to <b>System &gt; Single Sign On.</b></li> </ol>  <ol style="list-style-type: none"> <li>Select the <b>SSO Zones</b> tab.</li> </ol>  <ol style="list-style-type: none"> <li>Click the <b>Add</b> icon.</li> </ol>  <ol style="list-style-type: none"> <li>Type a value for field <b>Remote Name.</b></li> </ol>  <ol style="list-style-type: none"> <li>For field X.509 Certificate, paste the encoded certificate text from the clipboard that was previously copied from the DSR NOAM.</li> </ol>  <ol style="list-style-type: none"> <li>Click the <b>Save</b> icon.</li> </ol>  <ol style="list-style-type: none"> <li>Click the <b>Refresh</b> icon to display the data saved for remote zone.</li> </ol> 

**Procedure 48. Integrate iDIH into DSR (Optional)**

<b>S T E P #</b>	<p>This procedure configures the iDIH connections to DSR.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>												
<p>1. <input type="checkbox"/></p>	<p>Configure the iDIH ComAgent connection on the NOAM</p> <p>1. Navigate to <b>Communication Agent &gt; Configuration &gt; Remote Servers</b>.</p>  <p>2. Click <b>Insert</b>.</p>  <p>3. Add the iDIH Mediation server.</p> <p>4. For the <b>Remote Server IP Address</b> field, type the <b>IMI IP address</b> of the iDIH Mediation server.</p> <p>5. For the <b>IP Address Preference</b> field, select the <b>IP protocol preference</b> (if IPv6 and IPv4 are configured).</p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Remote Server Name *</td> <td><input type="text"/></td> </tr> <tr> <td>Remote Server IPv4 IP Address</td> <td><input type="text"/></td> </tr> <tr> <td>Remote Server IPv6 IP Address</td> <td><input type="text"/></td> </tr> <tr> <td>Remote Server Mode *</td> <td>-- Select -- <input type="button" value="v"/></td> </tr> <tr> <td>IP Address Preference</td> <td>ComAgent Network Preference <input type="button" value="v"/></td> </tr> </tbody> </table> <p>6. Set the <b>Remote Server Mode</b> to <b>Server</b>.</p>	Field	Value	Remote Server Name *	<input type="text"/>	Remote Server IPv4 IP Address	<input type="text"/>	Remote Server IPv6 IP Address	<input type="text"/>	Remote Server Mode *	-- Select -- <input type="button" value="v"/>	IP Address Preference	ComAgent Network Preference <input type="button" value="v"/>
Field	Value												
Remote Server Name *	<input type="text"/>												
Remote Server IPv4 IP Address	<input type="text"/>												
Remote Server IPv6 IP Address	<input type="text"/>												
Remote Server Mode *	-- Select -- <input type="button" value="v"/>												
IP Address Preference	ComAgent Network Preference <input type="button" value="v"/>												

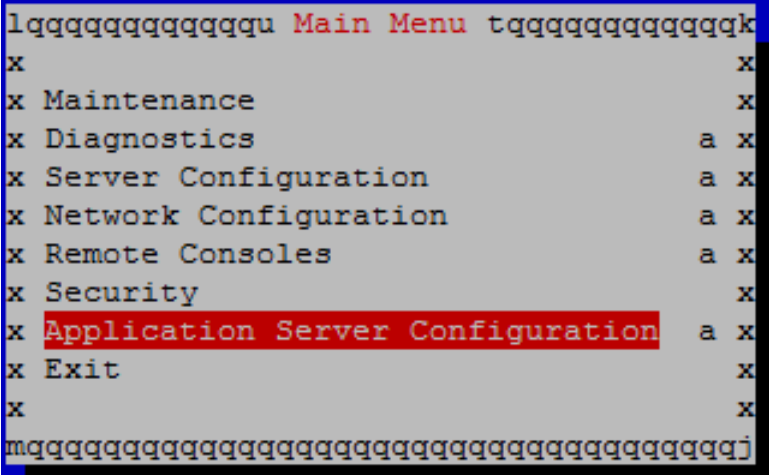
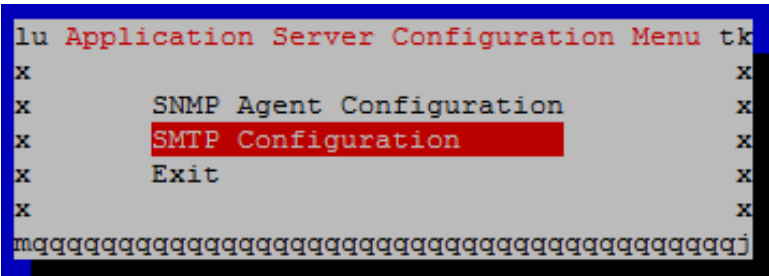
**Procedure 48. Integrate iDIH into DSR (Optional)**

<p>2. <input type="checkbox"/></p>	<p>Configure the Troubleshooting with iDIH on the SOAM</p>	<p>1. Navigate to <b>Diameter &gt; Troubleshooting with iDIH &gt; Configuration &gt; Options</b>.</p>  <p>2. Type the fully qualified iDIH host name (or IP address) in the iDIH <b>Visualization Address</b> field:</p> <p><b>Main Menu: Diameter -&gt; Troubleshooting with iDIH -&gt; Configuration -&gt; Options</b></p>  <p>3. Click <b>Apply</b>.</p>
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**Procedure 49. iDIH Configuration: Configure the Mail Server (Optional)**

<p><b>S T E P #</b></p>	<p>This procedure configures the SMTP mail server.</p> <p><b>Note:</b> This procedure is optional; however, this option is required for security (password initialization set to AUTOMATIC) and forwarding (forwarding by mail filter defined), and is available only on the Application server.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
<p>1. <input type="checkbox"/></p>	<p><b>iDIH Application Server: Login</b></p>	<p>1. Establish an SSH session to the iDIH Application server.</p> <p>2. Login as the <b>admusr</b> user.</p>

**Procedure 49. iDIH Configuration: Configure the Mail Server (Optional)**

<p>2. <input type="checkbox"/></p>	<p><b>iDIH Application Server:</b> Configure the authenticated mail server</p>	<ol style="list-style-type: none"> <li>From the platcfg menu, type the following command:  <pre>\$ sudo su - platcfg</pre> </li> <li>Select <b>Application Server Configuration</b>.   </li> <li>Select <b>SMTP Configuration</b>.   </li> <li>Select <b>Edit</b>.</li> <li>Enter the following parameters: <ul style="list-style-type: none"> <li>Mail Server IP Address</li> <li>User</li> <li>Password</li> <li>Email Address (From)</li> <li>Mail smtp timeout</li> <li>Mail smtp connectiontimeout</li> <li>SNMP over SSL used?</li> </ul> </li> <li>Select <b>OK</b>.</li> <li>Select <b>Exit</b> to exit the platcfg menu.</li> </ol>
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**Procedure 51. iDIH Configuration: Change Network Interface (Optional)**

<b>S T E P #</b>	<p>This procedure changes the default network interface.</p> <p><b>Note:</b> Initially, the default network interface used to transport TTRs from DSR to DIH uses the internal IMI network; however, this can be changed, if required. It should be noted that changing this interface could degrade performance of TTR transmission.</p> <p><b>Note:</b> A script is provided to manage the settings so the operator does not need to know the details required to apply the settings. There are two settings <b>interface.name</b> and <b>interface.enabled</b>.</p> <p>When <b>interface.enabled=True</b>, then communications over the interface.name =value, where value is the name of the network interface as defined on the platform, is the only specified interface used for communications.</p> <p>When <b>interface.enabled=False</b> then communications over the named interface is not enforced, that is, all interfaces configured on the platform are allowed to be used for communications.</p> <p>For example, if it is required to use the XMI interface for communication instead of the default internal IMI interface, then the operator would supply <b>XMI</b> when asked for the interface name and <b>True</b> when asked if interface filtering should be applied.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<b>iDIH Mediation Server:</b> Login	<ol style="list-style-type: none"> <li>1. Establish an SSH session to the iDIH Mediation server.</li> <li>2. Login as the <b>admusr</b> user.</li> <li>3. Type the following command to login in as the <b>Tekelec</b> user.                     <pre style="margin-left: 20px;">\$ sudo su - tekelec</pre> </li> </ol>
2. <input type="checkbox"/>	<b>iDIH Mediation Server:</b> Execute the change interface script	<ol style="list-style-type: none"> <li>1. To execute the change interface script, type the following command:                     <pre style="margin-left: 20px;">\$ chgIntf.sh</pre> </li> <li>2. Answer the questions during the script as follows.                     <pre style="margin-left: 20px;">This script is used to change the interface name (default = imi) used for mediation communications and whether to enable network interface filtering or not. Please answer the following questions or enter CTRL-C to exit out of the script.  Current setting are: interface.name=imi interface.enabled=True  Enter new network interface name, return to keep current [imi]: xmi  Do you want to enable network interface filtering [True False], return to keep current [True]:  Updating configuration properties file with 'interface.name=xmi' and 'interface.enable=True', and restarting mediation configuration bundle...</pre> </li> </ol>

## 6. Post-Install Activities

### Procedure 52. Configure ComAgent Connections

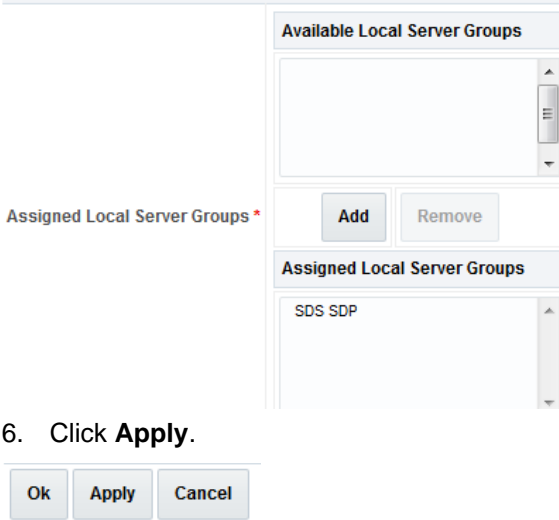

<p><b>S T E P #</b></p>	<p>This procedure configures ComAgent connections on DSR for use in the FABR application.  <b>Prerequisite:</b> FABR application is activated.                  Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.                  If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>
<p>1. <input type="checkbox"/></p>	<p><b>SDS NOAM VIP</b>  <b>GUI: Login</b></p> <ol style="list-style-type: none"> <li>1. Establish a GUI session on the SDS NOAM server by using the VIP IP address of the NOAM server. Open the web browser and type <b>https://&lt;Primary_SDS_NOAM_VIP_IP_Address&gt;</b> as the URL.</li> <li>2. Login as the <b>admusr</b> user.</li> </ol> 
<p>2. <input type="checkbox"/></p>	<p><b>SDS NOAM VIP</b>  <b>GUI: Configure remote server IP address</b></p> <ol style="list-style-type: none"> <li>1. Navigate to <b>Communication Agent &gt; Configuration &gt; Remote Servers</b>.</li> </ol>  <ol style="list-style-type: none"> <li>2. Click <b>Insert</b>.</li> </ol>

**Procedure 52. Configure ComAgent Connections**

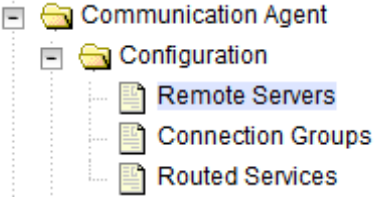


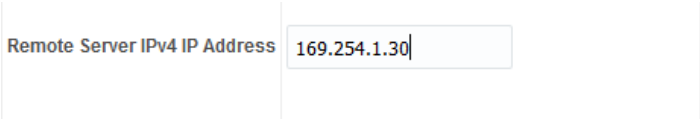

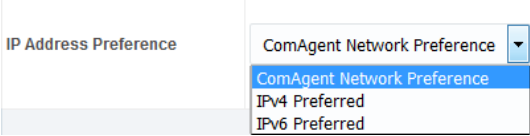
<p>3. <input type="checkbox"/> <b>SDS NOAM VIP GUI:</b> Configure remote server IP address</p>	<p>1. Type <b>Remote Server Name</b> for the DSR MP server.</p> <p>Remote Server Name * <input type="text" value="ZombieDAMP1"/></p> <p>2. Type the <b>Remote Server IMI IP address</b>.</p> <p>Remote Server IPv4 IP Address <input type="text" value="169.254.1.13"/></p> <p>Remote Server IPv6 IP Address <input type="text"/></p> <p><b>Note:</b> This should be the IMI IP address of the DAMP server.</p> <p>3. Select <b>Client</b> for the Remote Server Mode from the list.</p> <p>Remote Server Mode * <input type="text" value="Client"/> ▼</p> <p>4. Select <b>IP Address Preference</b> (ComAgent Network Preference, IPv4, or IPv6) from the list.</p> <p>IP Address Preference <input type="text" value="ComAgent Network Preference"/> ▼</p> <p style="margin-left: 20px;">ComAgent Network Preference ComAgent Network Preference IPv4 Preferred IPv6 Preferred</p> <p>5. Select the <b>Local Server Group</b> from the available SDS DP server groups and click '<b>Add</b>' to assign.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p style="text-align: center; margin: 0;"><b>Available Local Server Groups</b></p> <div style="border: 1px solid #ccc; padding: 2px; margin: 2px 0;"> <p style="margin: 0;">SDS SDP</p> </div> <p style="text-align: right; margin: 0;">▲ ☰ ▼</p> <p style="margin: 0;">Assigned Local Server Groups *</p> <p style="text-align: center; margin: 0;"> <input type="button" value="Add"/> <input type="button" value="Remove"/> </p> <p style="text-align: center; margin: 0;"><b>Assigned Local Server Groups</b></p> <div style="border: 1px solid #ccc; height: 40px; margin: 2px 0;"></div> <p style="text-align: right; margin: 0;">▲ ▼</p> </div>
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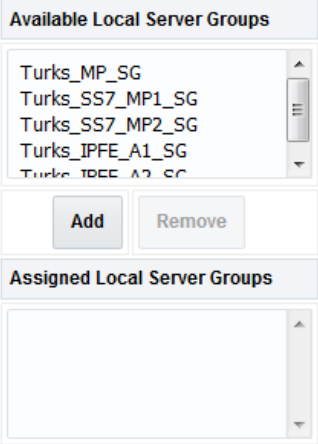
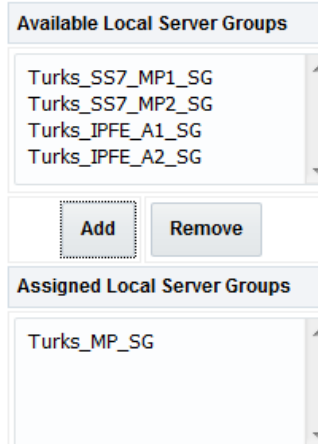
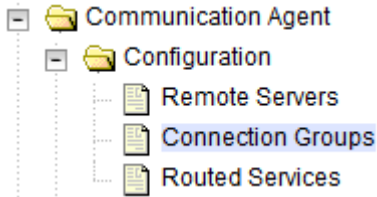
**Procedure 52. Configure ComAgent Connections**

		 <p>6. Click <b>Apply</b>.</p>
<p>4. <input type="checkbox"/></p>	<p><b>SDS NOAM VIP</b> GUI: Repeat</p>	<p>Repeat steps 2-3 for each remote MP in the same SOAM NE.</p>
<p>5. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b> GUI: Login</p>	<ol style="list-style-type: none"> <li>1. Establish a GUI session on the DSR NOAM server by using the VIP IP address of the NOAM server. Open the web browser and type <b>https://&lt;Primary_DSR_NOAM_VIP_IP_Address&gt;</b> as the URL</li> <li>2. Login as the <b>guidadmin</b> user.</li> </ol>  <p>Welcome to the Oracle System Login.</p> <p>This application is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the <a href="#">Oracle Software Web Browser Support Policy</a> for details.</p> <p>Unauthorized access is prohibited.</p> <p><small>Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. Copyright © 2010, 2016, <a href="#">Oracle</a> and/or its affiliates. All rights reserved.</small></p>

**Procedure 52. Configure ComAgent Connections**

<p>6. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b>  <b>GUI:</b> Configure remote server IP address</p>	<p>1. Navigate to <b>Communication Agent &gt; Configuration &gt; Remote Servers</b>.</p>  <p>2. Click <b>Insert</b>.</p> 
<p>7. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b>  <b>GUI:</b> Configure remote server IP address</p>	<p>1. Type <b>Remote Server Name</b> for the DSR MP server.</p>  <p>2. Type the <b>Remote Server IMI IP address</b>.</p>  <p><b>Note:</b> This should be the IMI IP address of the DP server.</p> <p>3. Select <b>Server</b> for the Remote Server Mode from the list.</p>  <p>4. Select <b>IP Address Preference</b> (ComAgent Network Preference, IPv4, or IPv6) from the list.</p>  <p>5. Select the <b>Local Server Group</b> from the available DSR MP server groups and click <b>'Add'</b> to assign.</p>

**Procedure 52. Configure ComAgent Connections**

		 <p>Assigned Local Server Groups *</p> <p>6. Click <b>Apply</b>.</p>  <p>Assigned Local Server Groups *</p> <p>Ok Apply Cancel</p>
<p>8. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b>  <b>GUI:</b> Repeat</p>	<p>Repeat steps 6-7 for each remote DP in the same SOAM NE.</p>
<p>9. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b>  <b>GUI:</b> Configure connection groups</p>	<p>Navigate to <b>Communication Agent &gt; Configuration &gt; Connection Groups</b>.</p> 

**Procedure 52. Configure ComAgent Connections**

<p>10. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b>  <b>GUI: Edit</b>          connection groups</p>	<p>1. Select the <b>DPSvcGroup</b> connection group.</p> <table border="1"> <thead> <tr> <th>Connection Group</th> <th>Server</th> </tr> </thead> <tbody> <tr> <td>DPSvcGroup</td> <td>+ 0 Servers</td> </tr> </tbody> </table> <p>2. Click <b>Edit</b>.</p> <p>3. Select the <b>DP Servers</b> from the Available Servers in Network Element list and click &gt;&gt; to assign.</p> <p><b>Editing existing Connection Groups</b></p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Connection Group Name *</td> <td>DPSvcGroup</td> <td>Unique identifier used to label a Connection Group. [Default: n/a; Range: A 32-character string. Valid characters alphanumeric and underscore. Must contain at least one digit.] [A value is required.]</td> </tr> </tbody> </table> <div> <p>Available Servers in Network Element: SDDP1</p> <p>Assigned Servers in Connection Group: </p> <p>&gt;&gt; &lt;&lt;</p> </div> <p><b>Editing existing Connection Groups</b></p> <table border="1"> <thead> <tr> <th>Field</th> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Connection Group Name *</td> <td>DPSvcGroup</td> <td>Unique identifier used to label a Connection Group. [Default: n/a; Range: A 32-character string. Valid characters alphanumeric and underscore. Must contain at least one digit.] [A value is required.]</td> </tr> </tbody> </table> <div> <p>Available Servers in Network Element: </p> <p>Assigned Servers in Connection Group: SDDP1</p> <p>&gt;&gt; &lt;&lt;</p> </div> <p>Ok Apply Cancel</p>	Connection Group	Server	DPSvcGroup	+ 0 Servers	Field	Value	Description	Connection Group Name *	DPSvcGroup	Unique identifier used to label a Connection Group. [Default: n/a; Range: A 32-character string. Valid characters alphanumeric and underscore. Must contain at least one digit.] [A value is required.]	Field	Value	Description	Connection Group Name *	DPSvcGroup	Unique identifier used to label a Connection Group. [Default: n/a; Range: A 32-character string. Valid characters alphanumeric and underscore. Must contain at least one digit.] [A value is required.]
Connection Group	Server																	
DPSvcGroup	+ 0 Servers																	
Field	Value	Description																
Connection Group Name *	DPSvcGroup	Unique identifier used to label a Connection Group. [Default: n/a; Range: A 32-character string. Valid characters alphanumeric and underscore. Must contain at least one digit.] [A value is required.]																
Field	Value	Description																
Connection Group Name *	DPSvcGroup	Unique identifier used to label a Connection Group. [Default: n/a; Range: A 32-character string. Valid characters alphanumeric and underscore. Must contain at least one digit.] [A value is required.]																
<p>11. <input type="checkbox"/></p>	<p><b>DSR NOAM VIP</b>  <b>GUI: Verify</b>          servers in group</p>	<p>Verify the correct number of servers are in the connection group.</p> <table border="1"> <thead> <tr> <th>Connection Group</th> <th>Server</th> </tr> </thead> <tbody> <tr> <td>DPSvcGroup</td> <td>1 Server</td> </tr> <tr> <td></td> <td>SDSDP1</td> </tr> </tbody> </table>	Connection Group	Server	DPSvcGroup	1 Server		SDSDP1										
Connection Group	Server																	
DPSvcGroup	1 Server																	
	SDSDP1																	


**Procedure 53. Complete PCA Configuration (Optional)**

<b>S T E P #</b>	<p>This procedure completes PCA configuration.</p> <p><b>Prerequisite:</b> PCA application is activated.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<p>Complete PCA configuration</p>	<p>Refer to Section PCA Configuration of [2] DSR PCA Activation Guide for the steps required to complete PCA configuration.</p>

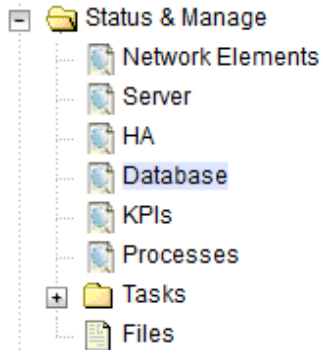
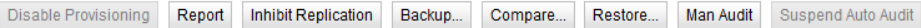
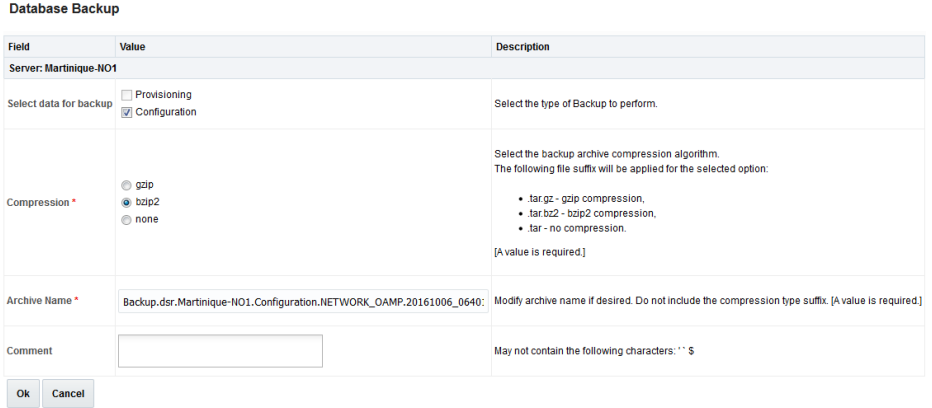
**Procedure 54. Backups and Disaster Prevention**

<b>S T E P #</b>	<p>This procedure provides instruction on backups and disaster prevention.</p> <p><b>Prerequisite:</b> DSR and optional sub-systems are installed configured.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<p><b>Backup from VIM</b></p>	<p>The preferred method of backing up cloud system VM instances is by snapshotting. Once the DSR and optional sub-systems are installed and configured, but before adding traffic, use the appropriate cloud tool such as the VMware Manager or the OpenStack Horizon GUI, to take snapshots of critical VM instances. It is particularly important to snapshot the control instances, such as the NOAM and SOAM.</p> <p><b>Note:</b> To be on the safer side, follow the below steps also to back up the NOAM and SOAM database</p>
2. <input type="checkbox"/>	<p><b>Identify Backup Server</b></p>	<p>Identify an external server to be used as a backup server for the following steps. The server should not be co-located with any of the following items:</p> <ul style="list-style-type: none"> <li>• Cloud Infrastructure Manager Server/Controller</li> <li>• DSR NOAM</li> <li>• DSR SOAM</li> </ul>

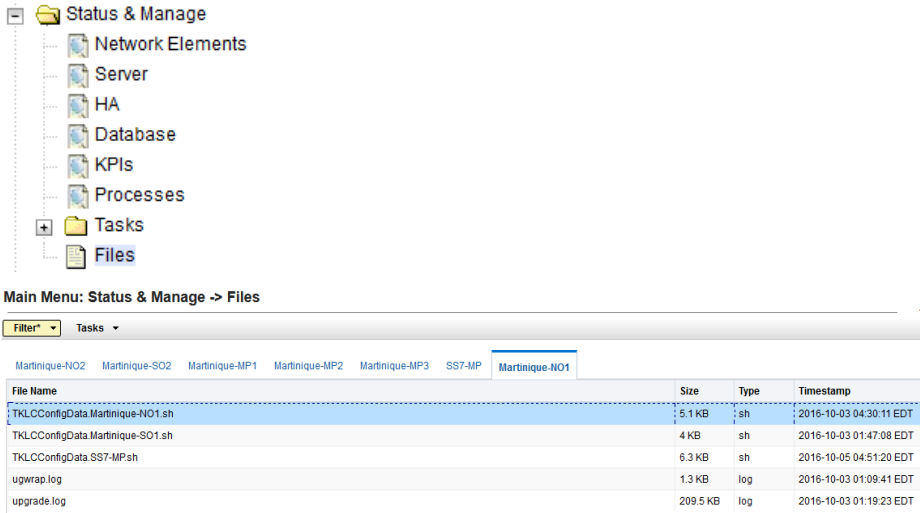
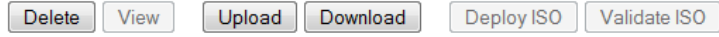
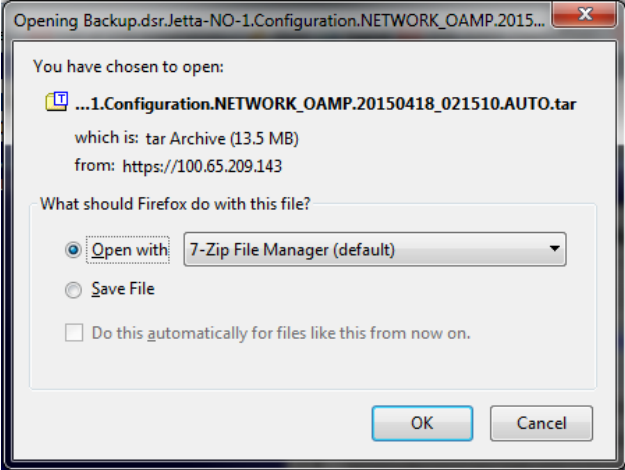
**Procedure 54. Backups and Disaster Prevention**

<p>3. <input type="checkbox"/></p>	<p><b>NOAM/SOAM VIP: Login</b></p>	<ol style="list-style-type: none"> <li>1. Establish a GUI session on the NOAM or SOAM server by using the VIP IP address of the NOAM or SOAM server.</li> <li>2. Open the web browser and enter a URL of: <code>http://&lt;Primary_NOAM/SOAM_VIP_IP_Address&gt;</code></li> <li>3. Login as the <b>guiadmin</b> user:</li> </ol> <div style="text-align: center;">  </div>
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**Procedure 54. Backups and Disaster Prevention**

<p>4. <input type="checkbox"/> <b>NOAM/SOAM VIP:</b> Backup configuration data for the system</p>	<p>1. Navigate to <b>Main Menu &gt; Status &amp; Manage &gt; Database.</b></p>  <p>2. Select the active NOAM server and click <b>Backup.</b></p>  <p>3. Make sure the <b>Configuration</b> checkbox is marked.</p>  <p>4. Enter a filename for the backup and click <b>OK.</b></p>
---	--

**Procedure 54. Backups and Disaster Prevention**

<p>5. <input type="checkbox"/></p>	<p><b>NOAM/SOAM VIP:</b> Verify the backup file existence.</p>	<p>1. Navigate to <b>Main Menu &gt; Status &amp; Manage &gt; Files.</b></p>  <p>Main Menu: Status &amp; Manage -&gt; Files</p> <table border="1"> <thead> <tr> <th>File Name</th> <th>Size</th> <th>Type</th> <th>Timestamp</th> </tr> </thead> <tbody> <tr> <td>TKLCConfigData.Martinique-NO1.sh</td> <td>5.1 KB</td> <td>sh</td> <td>2016-10-03 04:30:11 EDT</td> </tr> <tr> <td>TKLCConfigData.Martinique-SO1.sh</td> <td>4 KB</td> <td>sh</td> <td>2016-10-03 01:47:08 EDT</td> </tr> <tr> <td>TKLCConfigData.SS7-MP.sh</td> <td>6.3 KB</td> <td>sh</td> <td>2016-10-05 04:51:20 EDT</td> </tr> <tr> <td>ugwrap.log</td> <td>1.3 KB</td> <td>log</td> <td>2016-10-03 01:09:41 EDT</td> </tr> <tr> <td>upgrade.log</td> <td>209.5 KB</td> <td>log</td> <td>2016-10-03 01:19:23 EDT</td> </tr> </tbody> </table> <p>2. Select the active NOAM or SOAM tab.</p> <p>3. The files on this server display. Verify the existence of the backup file.</p>	File Name	Size	Type	Timestamp	TKLCConfigData.Martinique-NO1.sh	5.1 KB	sh	2016-10-03 04:30:11 EDT	TKLCConfigData.Martinique-SO1.sh	4 KB	sh	2016-10-03 01:47:08 EDT	TKLCConfigData.SS7-MP.sh	6.3 KB	sh	2016-10-05 04:51:20 EDT	ugwrap.log	1.3 KB	log	2016-10-03 01:09:41 EDT	upgrade.log	209.5 KB	log	2016-10-03 01:19:23 EDT
File Name	Size	Type	Timestamp																							
TKLCConfigData.Martinique-NO1.sh	5.1 KB	sh	2016-10-03 04:30:11 EDT																							
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TKLCConfigData.SS7-MP.sh	6.3 KB	sh	2016-10-05 04:51:20 EDT																							
ugwrap.log	1.3 KB	log	2016-10-03 01:09:41 EDT																							
upgrade.log	209.5 KB	log	2016-10-03 01:19:23 EDT																							
<p>6. <input type="checkbox"/></p>	<p><b>NOAM/SOAM VIP:</b> Download the file to a local machine.</p>	<p>1. From the previous step, select the backup file.</p> <p>2. Click <b>Download.</b></p>  <p>1.1 GB used (5.93%) of 18.4 GB available   System utilization: 1.1 GB (5.99%) of 18.4 GB available.</p> <p>3. Click <b>OK.</b></p> 																								
<p>7. <input type="checkbox"/></p>	<p>Upload the image to secure location</p>	<p>Transfer the backed up image to a secure location identified in step 2 where the server backup files are fetched in case of system disaster recovery.</p>																								
<p>8. <input type="checkbox"/></p>	<p>Backup active SOAM</p>	<p>Repeat <b>Steps 4 through 7</b> to back up the active SOAM.</p>																								



**Procedure 55. (KVM/OpenStack Only) Configure Port Security**

<b>S T E P #</b>	<p>This procedure configures port security on TSA.</p> <p><b>Prerequisite:</b> Perform <b>Enable the Neutron port security extension</b> first. We require this extension to disable the Neutron anti-spoofing filter rules for a given port. Refer to Disable Port Security in Appendix G.6 where this is discussed.</p> <p>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<p>IPFE with TSA only. Remove allowable address pair security on IPFE XSI network and DAMP XSI interfaces on IPFE and MP instances</p>	<p>If stacks are deployed using HEAT template, follow this step.</p> <ol style="list-style-type: none"> <li>Determine the TSA IP address used in Procedure 34, step 2.</li> <li>Determine the corresponding XSI interface IP address assigned to that TSA used in Procedure 34, step 2.</li> <li>Determine the XSI IP address of IPFE used in Procedure 34, step 2.</li> <li>Log into the OpenStack control node as the <b>admusr</b> user.</li> <li>Source the tenant user credentials.</li> <li>Determine the port ID of the XSI interface IP address.</li> </ol> <pre>\$ neutron port-list -F id -F fixed_ips   grep &lt;XSI network&gt;</pre> <p><b>Note:</b> &lt;port ID&gt; is the value in first column of the output to this command.</p> <ol style="list-style-type: none"> <li>Remove allowed_address_pairs:</li> </ol> <pre>\$ neutron port-update &lt;Port ID&gt; --no-allowed-address-pairs</pre> <p><b>Note:</b> Execute neutron port-show command to verify allowed_address_pairs attribute is empty.</p>
2. <input type="checkbox"/>	<p>IPFE with TSA only. Remove port security on TSA XSI network interfaces on IPFE and MP instances</p>	<p>If using IPFE with Target Set Addresses (TSA).</p> <ol style="list-style-type: none"> <li>Determine the TSA IP address as used in section 5.3, Procedure 34.</li> <li>Determine the corresponding XSI interface IP address as used in section 5.3, Procedure 34.</li> <li>Log into the OpenStack control node as the <b>admusr</b> user.</li> <li>Source the tenant user credentials.</li> <li>Determine security groups associated with the IPFE instance.</li> </ol> <pre>\$ nova list-secgroup &lt;VM instance ID&gt;</pre> <p><b>Note:</b> &lt;VM instance ID&gt; can be queried from the output of <b>nova list</b> command in the ID column for the given VM.</p> <ol style="list-style-type: none"> <li>Save the ID and names of the listed security groups for later use.</li> <li>Remove all listed security groups.</li> </ol> <pre>\$ nova remove-secgroup &lt;VM instance ID&gt; &lt;Security group ID&gt;</pre> <p><b>Note:</b> Use the &lt;VM instance ID&gt; and &lt;Security group ID&gt; as noted down in the step-6 above.</p>

**Procedure 55. (KVM/OpenStack Only) Configure Port Security**

		<p>Alternatively, use the following syntax:</p> <pre>\$ nova remove-secgroup &lt;VM instance name&gt; &lt;Security group name&gt;</pre> <p>8. Determine the port ID of the XSI interface IP address from step 2 above.</p> <pre>\$ neutron port-list -F id -F fixed_ips   grep &lt;instance IP on TSA/XSI network&gt;</pre> <p><b>Note:</b> &lt;port ID&gt; is the value in first column of the output to this command.</p> <p>9. Disable port security for the port found in step 7.</p> <pre>\$ neutron port-update &lt;Port ID&gt; --port-security-enabled=false</pre> <p>10. Re-enable port security for all the interfaces not on the TSA/XSI port used in step 9, including XMI, IMI, and others.</p> <p>11. Determine the port IDs of the instance IP addresses not associated with the TSA/XSI network.</p> <pre>\$ neutron port-list -F id -F fixed_ips   grep &lt;instance IP not on TSA/XSI network&gt;</pre> <p>12. For each of the non TSA/XSI instance ports perform the following command for each of the security groups from step 6.</p> <pre>\$ neutron port-update &lt;Port ID&gt; --security-group &lt;Security group ID&gt;</pre> <p><b>Note:</b> Use the &lt;Security Group ID&gt; as noted down in the step-6 above.</p>
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**Procedure 56. Enable/Disable DTLS (SCTP Diameter Connections Only)**

<b>S T E P #</b>		<p>This procedure prepares clients before configuring SCTP Diameter connections.</p> <p>Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>
1. <input type="checkbox"/>	<p>Enable/Disable DTLS (SCTP Diameter connections only)</p>	<p>Oracle's SCTP Datagram Transport Layer Security (DTLS) has SCTP AUTH extensions by default. SCTP AUTH extensions are required for SCTP DTLS. However, there are known impacts with SCTP AUTH extensions as covered by the CVEs referenced below. It is highly recommended that customers prepare clients before the DSR connections are established after installation. This ensures the DSR to client SCTP connection establishes with SCTP AUTH extensions enabled. See RFC 6083. If customers DO NOT prepare clients to accommodate the DTLS changes, then the SCTP connections to client devices WILL NOT establish after the DSR is installed.</p> <ul style="list-style-type: none"> <li>• <a href="https://access.redhat.com/security/cve/CVE-2015-1421">https://access.redhat.com/security/cve/CVE-2015-1421</a></li> <li>• <a href="https://access.redhat.com/security/cve/CVE-2014-5077">https://access.redhat.com/security/cve/CVE-2014-5077</a></li> </ul> <p>Execute procedures in [19] DSR DTLS Feature Activation Procedure to disable/enable the DTLS feature.</p>

**Procedure 57. Shared Secret Encryption Key Revocation (RADIUS Only)**

<b>STEP #</b>	<p>This procedure changes the shared secret encryption key on DSR RADIUS setup. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<p>Revoke RADIUS shared secret encryption key</p>	<p>Refer to RADIUS Shared Secret Key revocation MOP to change the encryption key on the DSR installed setup. Refer to [20] DSR RADIUS Shared Secret Encryption Key Revocation MOP MO008572.</p> <p><b>Note:</b> It is highly recommended to change the key after installation due to security reasons.</p>

**Procedure 58. DSR Performance Tuning**

<b>STEP #</b>	<p>This procedure changes tuning parameters for the system to achieve better performance. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<p>Performance tuning (Optional)</p>	<p>Refer Appendix I Performance Tuning Recommended for performance tuning on DSR.</p>

**Procedure 59. Change NOAM/SOAM Profile for Increased MP Capacity on a Virtualized Environment**

<b>STEP #</b>	<p>This procedure describes how to change NOAM and SOAM VM profile when the MP capacity is increased on OpenStack and VMware. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.</p> <p>If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.</p>	
1. <input type="checkbox"/>	<p>Log in to OpenStack/VMware</p>	<ul style="list-style-type: none"> <li>• To change the VM profile when the MP capacity is increased on OpenStack, log in to Openstack GUI horizon dashboard.</li> <li>• To change the VM profile when the MP capacity is increased on VMware, log in to VM manager.</li> </ul>
2. <input type="checkbox"/>	<p>Refer to the section Change NOAM/SOAM VM Profile for Increased MP Capacity in [25] DSR Cloud Upgrade Guide.</p>	

**Appendix A. Sample Network Element and Hardware Profiles**

To enter all the network information for a network element into an AppWorks-based system, a specially formatted XML file needs to be filled out with the required network information. The network information is needed to configure both the NOAM and any SOAM network elements.

It is expected that the maintainer/creator of this file has networking knowledge of this product and the customer site at which it is being installed. The following is an example of a network element XML file.

The SOAM network element XML file needs to have same network names for the networks as the NOAM network element XML file has. It is easy to accidentally create different network names for NOAM and SOAM network elements, and then the mapping of services to networks are not possible.

```
<?xml version="1.0"?>
<networkelement>
  <name>NE</name>
  <networks>
    <network>
      <name>XMI</name>
      <vlanId>3</vlanId>
      <ip>10.2.0.0</ip>
      <mask>255.255.255.0</mask>
      <gateway>10.2.0.1</gateway>
      <isDefault>true</isDefault>
    </network>
    <network>
      <name>IMI</name>
      <vlanId>4</vlanId>
      <ip>10.3.0.0</ip>
      <mask>255.255.255.0</mask>
      <nonRoutable>true</nonRoutable>
    </network>
  </networks>
</networkelement>
```

**Figure 3. Example Network Element XML File**

**Note:** NetworkElement Name shall be unique while creating multiple Network Element.

## Appendix B. List of Frequently Used Time Zones

This table lists several valid time zone strings that can be used for the time zone setting in a CSV file, or as the time zone parameter when manually setting a DSR time zone.

**Table 6. List of Selected Time Zone Values**

Time Zone Value	Description	Universal Time Code (UTC) Offset
UTC	Universal Time Coordinated	UTC-00
America/New_York	Eastern Time	UTC-05
America/Chicago	Central Time	UTC-06
America/Denver	Mountain Time	UTC-07
America/Phoenix	Mountain Standard Time — Arizona	UTC-07

Time Zone Value	Description	Universal Time Code (UTC) Offset
America/Los Angeles	Pacific Time	UTC-08
America/Anchorage	Alaska Time	UTC-09
Pacific/Honolulu	Hawaii	UTC-10
Africa/Johannesburg		UTC+02
America/Mexico City	Central Time — most locations	UTC-06
Africa/Monrovia		UTC+00
Asia/Tokyo		UTC+09
America/Jamaica		UTC-05
Europe/Rome		UTC+01
Asia/Hong Kong		UTC+08
Pacific/Guam		UTC+10
Europe/Athens		UTC+02
Europe/London		UTC+00
Europe/Paris		UTC+01
Europe/Madrid	mainland	UTC+01
Africa/Cairo		UTC+02
Europe/Copenhagen		UTC+01
Europe/Berlin		UTC+01
Europe/Prague		UTC+01
America/Vancouver	Pacific Time — west British Columbia	UTC-08
America/Edmonton	Mountain Time — Alberta, east British Columbia & west Saskatchewan	UTC-07
America/Toronto	Eastern Time — Ontario — most locations	UTC-05
America/Montreal	Eastern Time — Quebec — most locations	UTC-05
America/Sao Paulo	South & Southeast Brazil	UTC-03
Europe/Brussels		UTC+01
Australia/Perth	Western Australia — most locations	UTC+08
Australia/Sydney	New South Wales — most locations	UTC+10
Asia/Seoul		UTC+09
Africa/Lagos		UTC+01
Europe/Warsaw		UTC+01
America/Puerto Rico		UTC-04
Europe/Moscow	Moscow+00 — west Russia	UTC+04
Asia/Manila		UTC+08

<b>Time Zone Value</b>	<b>Description</b>	<b>Universal Time Code (UTC) Offset</b>
Atlantic/Reykjavik		UTC+00
Asia/Jerusalem		UTC+02

## Appendix C. Common KVM/OpenStack Tasks

### Appendix C.1 Create a Network Port

#### Procedure 60. Create a Network Port

<p>1. <input type="checkbox"/></p>	<p>Create the network ports for the NO network interfaces</p>	<ol style="list-style-type: none"> <li>Each network interface on an instance must have an associated network port. An instance usually has at least eth0 and eth1 for a public and private network respectively. Some configurations require 6 or more interfaces and corresponding network ports.</li> <li>Determine the IP address for the interface. For eth0, the IP might be 10.x.x.157. For eth1, the IP might be 192.168.x.157</li> <li>Identify the neutron network ID associated with each IP/interface using the <b>neutron</b> command line tool. <pre>\$ neutron net-list</pre></li> <li>Identify the neutron subnet ID associated with each IP/interface using the <b>neutron</b> command line tool. <pre>\$ neutron subnet-list</pre></li> <li>Create the network port using the <b>neutron</b> command line tool, being sure to choose an informative name. Note the use of the subnet ID and the network ID (final argument). Port names are usually a combination of instance name and network name. NO1-xmi SO2-imi MP5-xsi2 The ports must be owned by the DSR tenant user, not the admin user. Either source the credentials of the DSR tenant user or use the DSR tenant user ID as the value for the <b>—tenant-id</b> argument. <pre>\$ . keystonerc_dsr_user</pre> <pre>\$ keystone user-list</pre> <pre>\$ neutron port-create --name=NO1-xmi --tenant-id &lt;tenant id&gt; --fixed-ip subnet_id=&lt;subnet id&gt;,ip_address=10.x.x.157 &lt;network id&gt;</pre> <pre>\$ neutron port-create --name=NO1-imi --tenant-id &lt;tenant id&gt; --fixed-ip subnet_id=&lt;subnet id&gt;,ip_address=192.168.x.157 &lt;network id&gt;</pre> View your newly created ports using the neutron tool. <pre>\$ neutron port-list</pre></li> </ol>
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## Appendix C.2 Create and Boot OpenStack Instance

### Procedure 61. Create and Boot OpenStack Instance

<p>1. <input type="checkbox"/></p>	<p>Create a VM instance from a glance image</p>	<p>1. Get the following configuration values.</p> <p>The image ID.</p> <pre>\$ glance image-list</pre> <p>The flavor ID.</p> <pre>\$ nova flavor-list</pre> <p>The network ID(s)</p> <pre>\$ neutron net-list</pre> <p>An informative name for the instance.</p> <p>NO1 SO2 MP5</p> <p>2. Create and boot the VM instance.</p> <p>The instance must be owned by the DSR tenant user, not the admin user. Source the credentials of the DSR tenant user and issue the following command. Number of IP/interfaces for each VM type must conform with the OCDSR Network to Device Assignments defined in [24] DSR Cloud Benchmarking Guide.</p> <p><b>Note:</b> IPv6 addresses should use the <b>v6-fixed-ip</b> argument instead of <b>v4-fixed-ip</b>.</p> <pre>\$ nova boot --image &lt;image ID&gt; --flavor &lt;flavor id&gt; --nic net-id=&lt;first network id&gt;,v4-fixed-ip=&lt;first ip address&gt; --nic net-id=&lt;second network id&gt;,v4-fixed-ip=&lt;second ip address&gt; InstanceName</pre> <p>View the newly created instance using the nova tool.</p> <pre>\$ nova list --all-tenants</pre> <p>The VM takes approximately 5 minutes to boot. At this point, the VM has no configured network interfaces and can only be accessed by the Horizon console tool.</p>
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## Appendix C.3 Configure Networking for OpenStack Instance

### Procedure 62. Configure Networking for OpenStack Instance

<p>1. <input type="checkbox"/></p>	<p>Verify/Configure the network interface</p>	<ol style="list-style-type: none"> <li>1. Check if the interface is configured automatically.</li> <li>2. If DHCP is enabled on Neutron subnet, VM configures the VNIC with the IP address. To verify, ping the XMI IP address provided with the <b>nova boot</b> command:             <pre>\$ping &lt;XMI-IP-Provided-During-Nova-Boot&gt;</pre> <p>If the ping is successful, ignore the next part to configure the interface manually.</p> <p>Manually configure the interface, if not already done (optional).</p> <ol style="list-style-type: none"> <li>a. Log into the <b>Horizon</b> GUI as the DSR tenant user.</li> <li>b. Go to the Compute/Instances section.</li> <li>c. Click on the <b>Name</b> field of the newly created instance.</li> <li>d. Select the Console tab.</li> <li>e. Login as the <b>admusr</b> user.</li> <li>f. Configure the network interfaces, conforming with the interface-to-network mappings defined in [24] DSR Cloud Benchmarking Guide.                 <pre>\$ sudo netAdm add --onboot=yes --device=eth0 --address=&lt;xmi ip&gt; --netmask=&lt;xmi net mask&gt;</pre> <pre>\$ sudo netAdm add --route=default --device=eth0 --gateway=&lt;xmi gateway ip&gt;</pre> <p>Under some circumstances, it may be necessary to configure as many as 6 or more interfaces.</p> </li> </ol> </li> <li>3. Reboot the VM. It takes approximately 5 minutes for the VM to complete rebooting.             <pre>\$ sudo init 6</pre> <p>The new VM should now be accessible using both network and Horizon console.</p> </li> </ol>
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## Appendix D. Common OVM Manager Tasks (CLI)

### Appendix D.1 Set Up the Server

**Note:** This section sets up the server using the command line interface of OVM Manager. All configurations/setup **can also be done** from the GUI/dashboard of OVM Manager.

#### Procedure 63. Set Up the Server

<p>1. <input type="checkbox"/></p>	<p>Log into the OVM-M command line interface</p>	<pre>ssh -l admin &lt;OVM-M IP&gt; -p 1000</pre> <p>Example:</p> <pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000</pre> <pre>admin@10.240.16.138's password:</pre>
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**Procedure 63. Set Up the Server**

<p>2. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Discover Oracle VM server</p>	<pre>discoverServer ipAddress=value password=value takeOwnership= { Yes   No }</pre> <p><b>Example:</b></p> <pre>OVM&gt;discoverServer ipAddress=10.240.16.139 password=password takeOwnership=Yes</pre>
<p>3. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create an ethernet-based network with the VM role</p>	<pre>create Network [ roles= { MANAGEMENT   LIVE_MIGRATE   CLUSTER_HEARTBEAT   VIRTUAL_MACHINE   STORAGE } ] name=value [ description=value ] [ on Server instance ]</pre> <p><b>Example:</b></p> <pre>OVM&gt;create Network name=XMI roles=VIRTUAL_MACHINE</pre>
<p>4. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Add a port from each Oracle VM server to the network</p>	<p><b>Note:</b> Skip this step and proceed to step 5 for bonded interfaces.</p> <ol style="list-style-type: none"> <li>Find the ID of an Ethernet port. <pre>OVM&gt; show Server name=MyServer1</pre> <pre>...</pre> <pre>Ethernet Port 1 = 0004fb00002000007711332ff75857ee [eth0 on MyServer3.virtlab.info]</pre> <pre>Ethernet Port 2 = 0004fb0000200000d2e7d2d352a6654e [eth1 on MyServer3.virtlab.info]</pre> <pre>Ethernet Port 3 = 0004fb0000200000c12192a08f2236e4 [eth2 on MyServer3.virtlab.info]</pre> </li> <li>Add a port from each Oracle VM Server to the network. <pre>OVM&gt;add Port instance to { BondPort   Network } instance</pre> </li> </ol> <p><b>Example:</b></p> <pre>OVM&gt;add Port id=0004fb0000200000d2e7d2d352a6654e to Network name=MyVMNetwork</pre>

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<p>5. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create Bondport (For Bonded Interfaces)</p>	<p>1. Find the ID of an Ethernet port.</p> <pre>OVM&gt;list Port Status: Success Time: 2016-08-22 04:43:02,565 EDT Data: id:0004fb0000200000045b4e8dc0b3acc6 name:usb0 on vms01.test.com id:0004fb00002000005fde208ce6392c0a name:eth4 on vms01.test.com id:0004fb0000200000b1dceeb39006d839 name:eth5 on vms01.test.com id:0004fb000020000027e3a02bc28dd153 name:eth2 on vms01.test.com id:0004fb0000200000fce443e0d30cd3d5 name:eth3 on vms01.test.com id:0004fb0000200000a908e402fc542312 name:eth0 on vms01.test.com id:0004fb0000200000247b03c2a4a090ec name:eth1 on vms01.test.com</pre> <p>2. Create Bondport on required interfaces.</p> <pre>OVM&gt;create BondPort ethernetPorts="0004fb0000200000b1dceeb39006d839,0004fb0 000200000fce443e0d30cd3d5" mode=ACTIVE_PASSIVE mtu=1500 name=bond1 on Server name=compute01.test.com  Command: create BondPort ethernetPorts="0004fb0000200000b1dceeb39006d839,0004fb0 000200000fce443e0d30cd3d5" mode=ACTIVE_PASSIVE mtu=1500 name=bond1 on Server name=compute01.test.com Status: Success</pre>
<p>6. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Add VLAN Interface to network (for VLAN tagged networks)</p>	<p>1. Find the ID of an Ethernet port.</p> <pre>OVM&gt;list BondPort Command: list BondPort Status: Success Time: 2016-08-22 04:38:22,327 EDT Data: id:0004fb00002000005a45a0761813d512 name:bond1 id:0004fb0000200000645cfc865736cea8 name:bond0 on compute01.test.com</pre> <p>2. Create VLAN interface.</p> <pre>OVM&gt;create VlanInterface vlanId=43 name=bond1.43 on BondPort id=0004fb00002000005a45a0761813d512</pre>

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		<pre> Command: create VlanInterface vlanId=43 name=bond1.43 on BondPort id=0004fb00002000005a45a0761813d512  Status: Success  3. Add remaining VLAN interfaces to the same bond accordingly, like:  OVM&gt;create VlanInterface vlanId=44 name=bond1.44 on BondPort id=0004fb00002000005a45a0761813d512  OVM&gt;create VlanInterface vlanId=30 name=bond1.30 on BondPort id=0004fb00002000005a45a0761813d512  OVM&gt;create VlanInterface vlanId=31 name=bond1.31 on BondPort id=0004fb00002000005a45a0761813d512  4. Add VLAN interfaces to network.  OVM&gt;add VlanInterface name=bond1.43 to Network name=XMI  Command: add VlanInterface name=bond1.43 to Network name=XMI  Status: Success  Time: 2016-08-22 05:14:29,321 EDT  JobId: 1471857258238  OVM&gt;add VlanInterface name=bond1.44 to Network name=IMI  Command: add VlanInterface name=bond1.44 to Network name=IMI  Status: Success  Time: 2016-08-22 05:15:24,216 EDT  JobId: 1471857321329  OVM&gt;add VlanInterface name=bond1.30 to Network name=XSI1  Command: add VlanInterface name=bond1.30 to Network name=XSI1  Status: Success  Time: 2016-08-22 05:15:39,190 EDT  JobId: 1471857337005  OVM&gt;add VlanInterface name=bond1.31 to Network name=XSI2  Command: add VlanInterface name=bond1.31 to Network name=XSI2  Status: Success  Time: 2016-08-22 05:15:52,576 EDT  JobId: 1471857349684 </pre>
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<p>7. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create unclustered server pool</p>	<p><b>Note:</b> To create clustered server pool, ignore this step and proceed to next.   <pre>OVM&gt;create ServerPool clusterEnable=No name=MyServerPool description='Unclustered server pool'</pre></p>
<p>8. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create clustered server pool (Optional)</p>	<p><b>Note:</b> Skip this step if an unclustered server pool is already created. This step is only if required to create a clustered server pool.</p> <p>1. To create a clustered server pool you must provide a file system or physical disk to use for the server pool file system. To find a file system or physical disk, use the list command:</p> <pre>OVM&gt;list FileSystem</pre> <pre>id:66a61958-e61a-44fe-b0e0-9dd64abef7e3 name:nfs on 10.172.76.125:/mnt/vol1/poolfs03</pre> <pre>id:0004fb0000050000b85745f78b0c4b61 name:fs on 350014ee2568cc0cf</pre> <pre>id:4ebb1575-e611-4662-87b9-a84b40ce3db7 name:nfs on 10.172.76.125:/mnt/vol1/poolfs04</pre> <pre>id:858d98c5-3d8b-460e-9160-3415cbdda738 name:nfs on 10.172.76.125:/mnt/vol1/poolfs01</pre> <pre>id:0dea4818-20e6-4d3a-958b-b12cf91588b5 name:nfs on 10.172.76.125:/mnt/vol1/poolfs02</pre> <pre>id:35b4f1c6-182b-4ea5-9746-51393f3b515c name:nfs on 10.172.76.125:/mnt/vol2/repo03</pre> <pre>id:aeb6143d-0a96-4845-9690-740bbf1e225e name:nfs on 10.172.76.125:/mnt/vol1/repo01</pre> <pre>id:05e8536f-8d9c-4d7c-bbb2-29b3ffafe011 name:nfs on 10.172.76.125:/mnt/vol2/repo02</pre> <pre>id:0004fb00000500006a46a8dbd2461939 name:MyServerPool_cluster_heartbeat</pre> <pre>id:0004fb00000500000809e28f4fab56b1 name:fs on 350014ee20137ee44</pre> <pre>OVM&gt;list PhysicalDisk</pre> <pre>id:0004fb000018000019b86ccf3f473a9e name:FreeBSD (9)</pre> <pre>id:0004fb0000180000c4609a67d55b5803 name:FreeBSD (3)</pre> <pre>id:0004fb00001800002179de6afe5f0cf3 name:SATA_WDC_WD5001ABYS-_WD-WCAS86288968</pre> <pre>id:0004fb0000180000a0b43f9684fc78ac name:FreeBSD (2)</pre> <pre>id:0004fb0000180000732be086afb26911 name:FreeBSD (7)</pre> <pre>id:0004fb000018000067ce80973e18374e name:FreeBSD (8)</pre> <pre>id:0004fb000018000035ce16ee4d58dc4d name:FreeBSD (1)</pre> <pre>id:0004fb00001800006855117242d9a537 name:FreeBSD (6)</pre> <pre>id:0004fb0000180000a9c7a87ba52ce5ec name:FreeBSD (5)</pre> <pre>id:0004fb0000180000ebabef9838188d78 name:SATA_WDC_WD5001ABYS-_WD-WCAS86571931</pre>

**Procedure 63. Set Up the Server**

		<pre>id:0004fb00001800008f6ea92426f2cfb8 name:SATA_WDC_WD5001ABYS-_WD-WCAS86257005  id:0004fb00001800008ccb1925cdbbd181 name:SATA_WDC_WD5001ABYS-_WD-WCAS86578538  id:0004fb0000180000e034b4662665161c name:FreeBSD (4)</pre> <p>2. Before you create a clustered server pool you must refresh the file system or physical disk to be used for the server pool file system. To refresh a file system:</p> <pre>OVM&gt;refresh { AccessGroup   Assembly   FileServer   FileSystem   PhysicalDisk   Repository   Server   StorageArray   VirtualAppliance } instance</pre> <p>For example, to refresh a physical disk:</p> <pre>OVM&gt;refresh PhysicalDisk id=0004fb000018000035ce16ee4d58dc4d</pre> <p>3. Refresh a file system:</p> <pre>OVM&gt;refresh FileSystem name="nfs on 10.172.76.125://mnt//vol1//repo01"</pre> <pre>OVM&gt;create ServerPool clusterEnable=Yes filesystem="nfs on 10.172.76.125://mnt//vol1//poolfs01" name=MyServerPool description='Clustered server pool'</pre>
<p>9. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Add Oracle VM servers to the server pool</p>	<pre>OVM&gt;add Server name=MyServer to ServerPool name=MyServerPool</pre>
<p>10. <input type="checkbox"/></p>	<p><b>OVM-M CLI:</b> Create storage repository</p>	<p>1. Find the physical disk (LUN) to use for creating the storage repository.</p> <pre>OVM&gt;list FileServer  Command: list FileServer  Status: Success  Time: 2016-08-19 02:11:39,779 EDT  Data:  id:0004fb00000900000445dac29e88bc38 name:Local FS vms03.test.com  id:0004fb0000090000045715cad6f165ecf name:Local FS vms01.test.com  id:0004fb00000900000df4cd9c3170092e4 name:Local FS vms02.test.com  id:0004fb0000090000064b96ed88a9a0185 name:Local FS vms04.test.com</pre> <p>2. Find a local file system on an Oracle VM server that has access to the LUN.</p> <pre>OVM&gt;list FileServer  Command: list FileServer  Status: Success</pre>

**Procedure 63. Set Up the Server**

		<pre> Time: 2016-08-19 02:11:39,779 EDT  Data:  id:0004fb00000900000445dac29e88bc38  name:Local FS vms03.test.com  id:0004fb0000090000045715cad6f165ecf  name:Local FS vms01.test.com  id:0004fb00000900000df4cd9c3170092e4  name:Local FS vms02.test.com  id:0004fb0000090000064b96ed88a9a0185  name:Local FS vms04.test.com  3. Create file system.  OVM&gt;create FileSystem name=VmsFs01 physicalDisk="OVM_SYS_REPO_PART_3600605b00a2a024000163e 490ac3f392" on FileServer name="Local FS vms01.test.com"  Command: create FileSystem name=VmsFs01 physicalDisk="OVM_SYS_REPO_PART_3600605b00a2a024000163e 490ac3f392" on FileServer name="Local FS vms01.test.com"  Status: Success  Time: 2016-08-19 02:22:46,581 EDT  JobId: 1471587738752  Data:  id:0004fb000005000006779d42da60c0be6  name:VmsFs01  4. Create repository.  OVM&gt;create Repository name=Vms01Repo on FileSystem name=VmsFs01  Command: create Repository name=Vms01Repo on FileSystem name=VmsFs01  Status: Success  Time: 2016-08-19 02:24:04,092 EDT  JobId: 1471587843432  Data:  id:0004fb000003000003c8f771791114d53  name:Vms01Repo  5. Add server pool to repository.  OVM&gt; add ServerPool name=TestPool001 to Repository name=Vms01Repo  Refresh the storage repository using the syntax:  OVM&gt; refresh Repository name=MyRepository </pre>
--	--	--

## Appendix D.2 Server Pool

A server pool is a required entity in Oracle VM, even if it contains a single Oracle VM Server. In practice, several Oracle VM servers form a server pool, and an Oracle VM environment may contain one or several server pools. Server pools are typically clustered, although an unclustered server pool is also possible. Server pools have shared access to storage repositories and exchange and store vital cluster information in the server pool file system. Refer [22] Oracle VM Concepts Guide for more information.

## Appendix E. Scale a Signaling Node

Execute this procedure only if an additional signaling node(s) needs to be deployed to an existing DSR deployment.

### Procedure 64. Scale a Signaling Node

<b>S T E P #</b>	<b>Note:</b> This procedure is ONLY required if additional Signaling Node(s) needs to be deployed to an existing DSR deployment.	
	<b>Prerequisite:</b> DSR topology is already deployed and configured as per <a href="#">Software Installation Using HEAT Templates (OpenStack)</a> .	
	Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.	
	If this procedure fails, contact My Oracle Support (MOS) and ask for assistance.	
1. <input type="checkbox"/>	Create new signaling stack	<ol style="list-style-type: none"> <li>1. Prepare OpenStack templates and environment files for signaling stacks by following instructions in Procedure 13 for signaling stacks.</li> <li>2. Create OpenStack parameter file for signaling stacks by following instructions in Procedure 15.  <b>Note:</b> Change the number of signaling node(s) as per the requirement.</li> <li>3. Deploy the stacks by following instructions in Procedure 16.  <b>Note:</b> New stack is created as part of this procedure.</li> </ol>
2. <input type="checkbox"/>	Configure new site in the existing topology	<ol style="list-style-type: none"> <li>1. Create a new network element by following Procedure 25 to define the network for new site being configured.</li> <li>2. Configure the SOAM servers by following Procedure 26 to create the SOAM servers.</li> <li>3. Configure the SOAM server group by following Procedure 27 to create SOAM server group.</li> <li>4. Configure the MP virtual machines by following Procedure 28.</li> <li>5. Configure the MP server group(s) and profiles by following Procedure 31.</li> <li>6. Configure the signaling network routes by following Procedure 32.</li> <li>7. If deployed stack contains IPFE servers, then configure the IPFE by following Procedure 34.</li> </ol>
3. <input type="checkbox"/>	Repeat	Repeat this procedure if more signaling nodes are required.



## Appendix F. Firewall Ports

Flow Description	Purpose	Protocol/Port	IP Protocol Version
NTP flow for time sync	XMI network	UDP:123	IPv4 , IPv6
hostname resolution (dns)	XMI, IMI Network	UDP/TCP: 53	IPv4, IPv6
LightWeight Directory Access Protocol (LDAP)	XMI Network	UDP/TCP: 389	IPv4, IPv6
SSH	XMI Network	TCP: 22	IPv4, IPv6
GUI	XMI Network	TCP: 80, TCP:443	IPv4, IPv6

For information about Firewall Ports, Refer to DSR 8.5 IP flow document.

## Appendix G. Application VIP Failover Options (OpenStack)

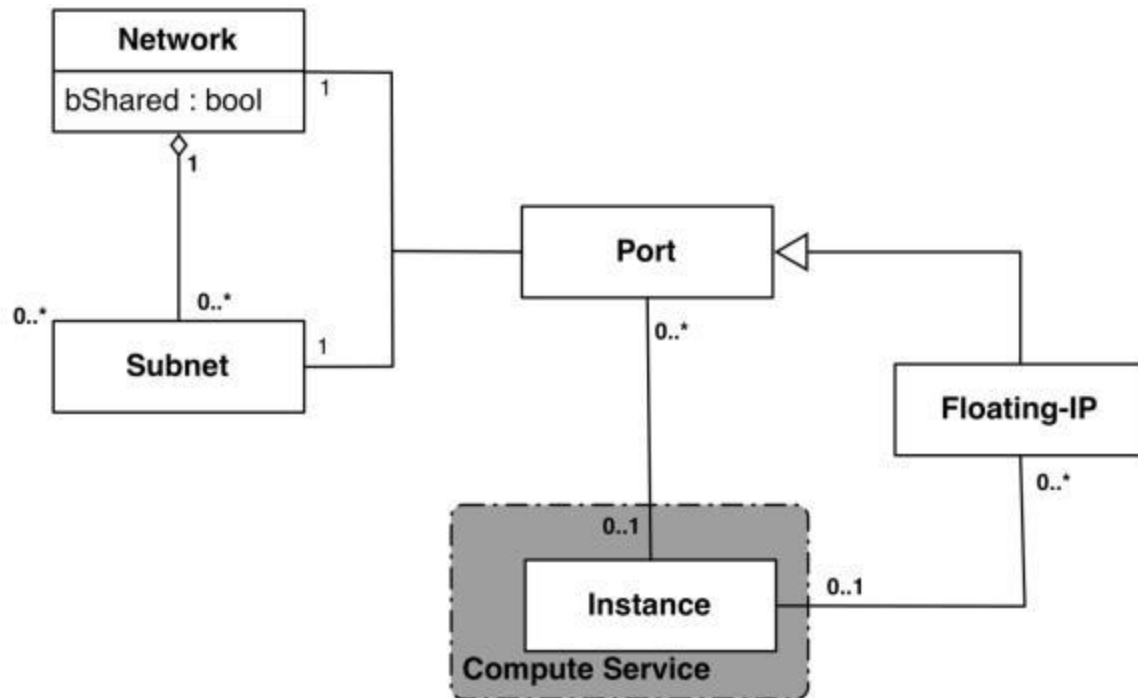
### Appendix G.1 Application VIP Failover Options

Within an OpenStack cloud environment, there are several options for allowing applications to manage their own virtual IP (VIP) addresses as is traditionally done in telecommunications applications. This document describes two of those options:

- Allowed address pairs
- Disable port security

Each of these options is covered in the major sub-sections that follow. The last major sub-section discusses how to utilize application managed virtual IP addresses within an OpenStack VM instance.

Both of these options effectively work around the default OpenStack Networking (Neutron) service anti-spoofing rules that ensure that a VM instance cannot send packets out a network interface with a source IP address different from the IP address Neutron has associated with the interface. In the Neutron data model, the logical notion of networks, sub-networks and network interfaces are realized as networks, subnets, and ports as shown in Figure 4:



**Figure 4. Neutron High-Level Data Model**

Note how a port in the Neutron data model maps to at most one VM instance where internal to the VM instance, the port is represented as an available network device such as eth0. VM instances can have multiple network interfaces in which case there are multiple Neutron ports associated with the VM instance, each with different MAC and IP addresses.

Each Neutron port by default has one MAC Address and one IPv4 or IPv6 address associated with it. The IP address associated with a port can be assigned in two ways:

- Automatically by Neutron when creating a port to fulfill an OpenStack Compute (Nova) service request to associate a network interface with a VM instance to be instantiated

OR

- Manually by a cloud administrator when creating or updating a Neutron port

The anti-spoofing rules are enforced at the Neutron port level by ensuring that the source IP address of outgoing packets matches the IP address Neutron has associated with the corresponding port assigned to the VM instance. By default if the source IP address in the outgoing packet does not match the IP address associated with the corresponding Neutron port then the packet is dropped.

These anti-spoofing rules clearly create a complication for the use of application managed virtual IP addresses since Neutron is not going to know about the VIPs being applied by the application to VM instance network interfaces without some interaction between the application (or a higher level management element) and Neutron. Which is why the two options in this document either fully disable the port security measures within Neutron, including the anti-spoofing rules, or expand the set of allowable source IP addresses to include the VIPs that may be used by the application running within a VM instance.

Note that for both of the options described in the following sub-sections, there is a particular Neutron service extension or feature that must be enabled for the option to work. For one option (allowed address pairs) the required Neutron extension is enabled in most default deployments whereas for the other option (allow port security to be disabled) it is not.

Within this document when describing how to use either of these two options, there is example command line operations that interact with the OpenStack Neutron service using its command line utility, simply

named `neutron`. However, be aware that all of the operations performed using the `neutron` command line utility can also be performed through the Neutron REST APIs, see the [Networking v2.0 API documentation](#) for more information.

## Appendix G.2 Allowed Address Pairs

This section describes an option that extends the set of source IP addresses that can be used in packets being sent out a VM instance's network interface (which maps to a Neutron port). This option utilizes a Neutron capability, called the `allowed-address-pairs` extension, which allows an entity (cloud administrator, management element, etc.) to define additional IP addresses to be associated with a Neutron port. In this way, if an application within the VM instance sends an outgoing packet with one of those additional IP addresses, then Neutron anti-spoofing rules enforcement logic does not drop those packets. The Neutron `allowed-address-pairs` extension is available starting with the OpenStack Havana release.

The three sub-sections that follow describe the OpenStack configuration requirements for this option, how to use this option after a VM instance has already booted, and how to utilize this option before a VM instance has booted.

## Appendix G.3 OpenStack Configuration Requirements

The Neutron `allowed-address-pairs` extension needs to be enabled for this option to work. For most OpenStack cloud deployments this extension should be enabled by default but to check, run the following command (after sourcing the appropriate user credentials file):

```
# neutron ext-list
```

alias	name
<code>security-group</code>	<code>security-group</code>
<code>l3_agent_scheduler</code>	<code>L3 Agent Scheduler</code>
<code>net-mtu</code>	<code>Network MTU</code>
<code>ext-gw-mode</code>	<code>Neutron L3 Configurable external gateway mode</code>
<code>binding</code>	<code>Port Binding</code>
<code>provider</code>	<code>Provider Network</code>
<code>agent</code>	<code>agent</code>
<code>quotas</code>	<code>Quota management support</code>
<code>subnet_allocation</code>	<code>Subnet Allocation</code>
<code>dhcp_agent_scheduler</code>	<code>DHCP Agent Scheduler</code>
<code>l3-ha</code>	<code>HA Router extension</code>
<code>multi-provider</code>	<code>Multi Provider Network</code>
<code>external-net</code>	<code>Neutron external network</code>
<code>router</code>	<code>Neutron L3 Router</code>
<b><code>allowed-address-pairs</code></b>	<b><code>Allowed Address Pairs</code></b>
<code>extraroute</code>	<code>Neutron Extra Route</code>
<code>extra_dhcp_opt</code>	<code>Neutron Extra DHCP opts</code>
<code>dvr</code>	<code>Distributed Virtual Router</code>

The `allowed-address-pairs` extension should appear in the list of extensions as shown in the bold line above.

## Appendix G.4 After a VM Instance has been Booted: Allowed Address Pairs

If a VM instance has already been booted, that is, instantiated, and you need to associate one or more additional IP addresses with the Neutron port assigned to the VM instance then you need to execute a command of the following form:

```
# neutron port-update <Port ID> --allowed_address_pairs list=true type=dict
ip_address=<VIP address to be added>
```

Where the bolded items have the following meaning:

- **<Port ID>**  
Identifies the ID of the port within Neutron which can be determined by listing the ports, `neutron port-list`, or if the port is named then the port ID can be obtained directly in the above command with a sequence like `$(neutron port-show -f value -F id <Port Name>)` to replace the **<Port ID>** placeholder.
- **<VIP address to be added>**  
Identifies the IP address, a virtual IP address in this case, that should additionally be associated with the port where this can be a single IP address, for example, 10.133.97.135/32, or a range of IP addresses as indicated by a value such as 10.133.97.128/30.

So for example if you wanted to indicate to Neutron that the allowed addresses for a port should include the range of addresses between 10.133.97.136 to 10.133.97.139 and the port had an ID of 8a440d3f-4e5c-4ba2-9e5e-7fc942111277 then you would type the following command:

```
# neutron port-update 8a440d3f-4e5c-4ba2-9e5e-7fc942111277 --
allowed_address_pairs list=true type=dict ip_address=10.133.97.136/30
```

## Appendix G.5 Before a VM Instance has been Booted: Allowed Address Pairs

If you want to associate additional allowed IP addresses with a port before it is associated with a VM instance then you need to first create the port and then associate one or more ports with a VM instance when it is booted. The command to create a new port with defined allowed address pairs is of the following form:

```
# neutron port-create --name <Port Name> --fixed-ip subnet-id=$(neutron
subnet-show -f value -F id <Subnet name>),ip_address=<Target IP address>
$(neutron net-show -f value -F id <Network name>) --allowed_address_pairs
list=true type=dict ip_address=<VIP address to be added>
```

Where the bolded items have the following meaning:

- **<Port Name>**  
This is effectively a string alias for the port that is useful when trying to locate the ID for the port but the **--name <Port Name>** portion of the command is completely optional.
- **<Subnet name>**  
The name of the subnet to which the port should be added.
- **<Target IP address>**  
The unique IP address to be associated with the port.
- **<Network Name>**  
The name of the network with which the port should be associated.
- **<VIP address to be added>**  
This parameter value has the same meaning as described in the previous section.

So for example if you wanted to indicate to Neutron that a new port should have an IP address of 10.133.97.133 on the **ext-subnet** subnet with a single allowed address pair, 10.133.97.134, then you would type a command similar to the following:

```
# neutron port-create -name foo --fixed-ip subnet-id=$(neutron subnet-show -f
value -F id ext-subnet),ip_address=10.133.97.133 $(neutron net-show -f value
-F id ext-net) --allowed_address_pairs list=true type=dict
ip_address=10.133.97.134/32
```

Once the port or ports with the additional allowed addresses have been created, when you boot the VM instance use a nova boot command similar to the following:

```
# nova boot --flavor m1.xlarge --image testVMimage --nic port-id=$(neutron
port-show -f value -F id <Port Name>) testvm3
```

where the flavor, image, and VM instance name values need to be replaced by values appropriate for your VM. If the port to be associated with the VM instance is not named, then you need to obtain the port's ID using the neutron port-list command and replace the `$(neutron port-show -f value -F id <Port Name>)` sequence in the above command with the port's ID value.

## Appendix G.6 Disable Port Security

This section describes an option that rather than extending the set of source IP addresses that are associated with a Neutron port, as is done with the allowed-address-pairs extension, to disable the Neutron anti-spoofing filter rules for a given port. This option allows all IP packets originating from the VM instance to be propagated no matter whether the source IP address in the packet matches the IP address associated with the Neutron port or not. This option relies upon the Neutron port security extension that is available starting with the OpenStack Kilo release.

The three sub-sections that follow describe the OpenStack configuration requirements for this option, how to use this option after a VM instance has already booted, and how to use this option before a VM instance has booted.

### OpenStack Configuration Requirements

The Neutron port security extension needs to be enabled for this method to work. For the procedure to enable the port security extension see the [ML2 Port Security Extension Wiki page](#).

**Note:** Enabling the port security extension when there are already existing networks within the OpenStack cloud causes all network related requests into Neutron to fail due to a [known bug in Neutron](#). There is a fix identified for this bug that is part of the Liberty release and is scheduled to be backported to the Kilo 2015.1.2 release. In the meantime, **this option is only non-disruptive when working with a new cloud deployment where the cloud administrator can enable this feature before any networks and VM instances that use those networks are created**. The port security extension can be enabled in an already deployed OpenStack cloud, but all existing networks, subnets, ports, etc., need to be deleted before enabling the port security extension. This typically means all VM instances also need to be deleted as well, but a knowledgeable cloud administrator **may** be able to do the following to limit the disruption of enabling the port security extension:

- Record the current IP address assignments for all VM instances,
- Remove the network interfaces from any existing VM instances,
- Delete the Neutron resources,
- Enable the port security extension,
- Re-create the previously defined Neutron resources (networks, subnets, ports, etc.), and then
- Re-add the appropriate network interfaces to the VMs.

Depending on the number of VM instances running in the cloud, this procedure may or may not be practical.

## Appendix G.7 After a VM Instance has been Booted: Port Security

If you need to disable port security for a port after it has already been associated with a VM instance, then you need to execute one or both of the following commands to use the port security option. First, if the VM instance with which the existing port is associated has any associated security groups (`run nova list-secgroup <VM instance name>` to check), then you first need to run a command of the following form for each of the security group(s) associated with the VM instance:

```
# nova remove-secgroup <VM instance name> <Security group name>
```

where the bolded item has the following meaning:

- **<VM instance name>**  
Identifies the name of the VM instance for which the identified security group name should be deleted.
- **<Security group name>**  
Identifies the name of the security group that should be removed from the VM instance.

So for example if you wanted to remove the default security group from a VM instance named 'testvm4' then you would type a command similar to the following:

```
# nova remove-secgroup testvm4 default
```

Once any security groups associated with VM instance to which the Neutron port is assigned have been removed, then the Neutron port(s) associated with the target VM instance need to be updated to disable port security on those ports. The command to disable port security for a specific Neutron port is of the form:

```
# neutron port-update <Port ID> -- port-security-enabled=false
```

where the bolded item has the following meaning:

- **<Port ID>**  
Identifies the ID of the port within Neutron which can be determined by listing the ports, `neutron port-list`, or if the port is named then the port ID can be obtained directly in the above command with a sequence such as `$(neutron port-show -f value -F id <Port Name>)`.

So for example if you wanted to indicate to Neutron that port security should be disabled for a port with an ID of 6d48b5f2-d185-4768-b5a4-c0d1d8075e41 then you would type the following command:

```
# neutron port-update 6d48b5f2-d185-4768-b5a4-c0d1d8075e41 --port-security-enabled=false
```

If the port-update command succeeds, within the VM instance with which the 6d48b5f2-d185-4768-b5a4-c0d1d8075e41 port is associated, application managed VIPs can now be added to the network interface within the VM instance associated with the port and network traffic using that VIP address should now propagate.

## Appendix G.8 Before a VM Instance has been Booted: Port Security

If you want to disable port security for a port before it is associated with a VM instance, then you need to first create the port at which time you can specify that port security should be disabled. The command to create a new port with port security disabled is of the following form:

```
# neutron port-create --name <Port Name> --port-security-enabled=false --fixed-ip subnet-id=$(neutron subnet-show -f value -F id <Subnet
```

```
name>),ip_address=<Target IP address> $(neutron net-show -f value -F id
<Network name>)
```

where the bolded items have the following meaning:

- **<Port Name>**  
This is effectively a string alias for the port that is useful when trying to locate the ID for the port but the **—name <Port Name>** portion of the command is completely optional.
- **<Subnet name>**  
The name of the subnet to which the port should be added.
- **<Target IP address>**  
The unique IP address to be associated with the port.
- **<Network Name>**  
The name of the network with which the port should be associated.

So for example if you wanted to indicate to Neutron that a new port should have port security disabled and an IP address of 10.133.97.133 on the **ext-subnet** subnet then you would type a command similar to the following:

```
# neutron port-create -name foo --port-security-enabled=false --fixed-ip
subnet-id=$(neutron subnet-show -f value -F id ext-
subnet),ip_address=10.133.97.133 $(neutron net-show -f value -F id ext-net)
```

Once the port or ports with port security disabled have been created, when you boot the VM instance, you need to execute a command similar to the following:

```
# nova boot --flavor m1.xlarge --image testVMimage --nic port-id=$(neutron
port-show -f value -F id <Port Name>) testvm3
```

where the flavor, image, and VM instance name values need to be replaced by values appropriate for your VM. If the port to be associated with the VM instance is not named, then you need to obtain the port's ID using the neutron port-list command and replace the `$(neutron port-show -f value -F id <Port Name>)` sequence in the above command with the port's ID value.

## Appendix G.9 Managing Application Virtual IP Addresses within VM Instances

Once either of the previously described options is in place to enable applications to manage their own virtual IP addresses, there should be no modifications required to how the application already manages its VIPs in a non-virtualized configuration. There are many ways that an application can add or remove virtual IP addresses but as a reference point, here are some example command line operations to add a virtual IP address of 10.133.97.136 to the eth0 network interface within a VM and then send four gratuitous ARP packets to refresh the ARP caches of any neighboring nodes:

```
# ip address add 10.133.97.136/23 broadcast 10.133.97.255 dev eth0 scope
global
# arping -c 4 -U -I eth0 10.133.97.136
```

As the creation of virtual IP addresses typically coincides with when an application is assigned an active role, the above operations would be performed both when an application instance first receives an initial active HA role or when an application instance transitions from a standby HA role to the active HA role.

## Appendix H. Sample Net Rules File

Udev uses rules files that determine how it identifies devices and creates device names. The udev daemon (udev) reads the rules files at system startup and stores the rules in memory. If the kernel discovers a new device or an existing device goes offline, the kernel sends an event action (uevent) notification to udevd, which matches the in-memory rules against the device attributes in /sys to identify the device. As part of device event handling, rules can specify additional programs that should run to configure a device. Rules file, which have the file extension .rules, is located in the following directory: /etc/udev/rules.d/\*.rules

Sample File:

```
# eth0 interface with MAC address "fa:16:3e:cc:12:d6" will be assigned "xmi"
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*",
ATTR{address}=="fa:16:3e:cc:12:d6", ATTR{dev_id}=="0x0", ATTR{type}=="1",
KERNEL=="eth*", NAME="xmi"

# eth1 interface with MAC address "fa:16:3e:1a:8d:8a" will be assigned "int"
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*",
ATTR{address}=="fa:16:3e:1a:8d:8a", ATTR{dev_id}=="0x0", ATTR{type}=="1",
KERNEL=="eth*", NAME="int"
```

**Note:** If you need a 3<sup>rd</sup> interface add respective entry also. The iDIH Mediation VM needs an imi interface too.

```
# eth1 interface with MAC address "fa:16:3e:1a:8d:8a" will be assigned "int"
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", ATTR{address}=="
fa:16:3e:8a:1a:12", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*",
NAME="imi":
```

**Notes:**

1. MAC address of each interfaces can be determined using the following command issued from the console: `ifconfig -a`
2. Update MAC address for each interface. The MAC addresses must be entered in all lower case.
3. Update the interface names as in the above example

## Appendix I. Performance Tuning Recommended

### Appendix I.1 KVM/OpenStack

For the DSR system to achieve 50K MPS or more through IPFE, a few tuning parameters need to be changed.

#### txqueuelen

Tuned on the compute hosts.

**Purpose:** default value of 500 is too small. Our recommendation is to set to 30000. Increases the network throughput of a VM.

**How/What to change:**

On each compute host, do the following as root.

```
# cat > /etc/udev/rules.d/60-tap.rules << EOF
KERNEL=="tap*", RUN+="/sbin/ip link set %k txqueuelen 30000"
EOF
```

Reload and apply to the running system



```
# udevadm control --reload-rules
# udevadm trigger --attr-match=subsystem=net
```

## Ring buffer increase on the physical ethernet interfaces

Tuned on the compute hosts.

**Purpose:** Improves the overall network throughput of the host.

**How/What to change:** This varies depending on the Host OS. The following steps are applicable to centos/fedora/rhel.

Add the following line into the network script of the interface you want to change. For example: To change the ring buffer on the eth2 interface. Edit /etc/sysconfig/network-scripts/ifcfg-eth2 to add the `ETHTOOL_OPTS=` line as shown.

```
DEVICE=eth2
TYPE=Ethernet
ETHTOOL_OPTS="--set-ring eth2 rx 4096 tx 4096"
```

Restart the network using "service network restart" as root. Check the setting using `ethtool -g eth2`.

## Multiqueue [on IPFE]

To be enabled on the openstack flavor and glance image for IPFE instance.

**Purpose:** Improves the network throughput of a VM.

**How/What to change:**

You need to update the flavor and the image to enable multiqueue. All guests using that image will be created with multiqueue.

```
# openstack flavor set m1.large --property hw:vif_multiqueue_enabled=true
# glance image-update b5592ed4-8f41-48a9-9f0c-e0e46cb3dd6c --property
hw_vif_multiqueue_enabled=true
```

On the Guest set the number of queues to number of vcpus.

Add the following line into the network script of the interface you want to change.

For example: To set the number of queues to number of vcpus.

Edit /etc/sysconfig/network-scripts/ifcfg-eth\_interface to set the multiqueue value to the number of vCPUs:

```
DEVICE=eth
TYPE=Ethernet
ETHTOOL_OPTS="-L ${DEVICE} combined <no_of_vCPUs>
```

Restart the network using "service network restart" as root.

Check the setting using `ethtool -l <eth_interface>`.

## Appendix I.2VMware

### txqueuelen

Tuned on the ESXi hosts.

**Purpose:** Default value of 500 is too small. The recommendation is to set to 10000 which increases the network throughput of a VM. ESXi defaults the value to 500 and permits a max value of 10000

**How/What to change:**

Log into the cli console of the ESX host and execute the below esxcli command:

```
#esxcli system settings advanced set -i=10000 -o=/Net/MaxNetifTxQueueLen
```

## Ring buffer increase on the physical Ethernet interfaces

Tuned on the ESXi hosts.

**Purpose:** Improves the overall network throughput of the host. On an ESXi host Rx buffer defaults to 512 and Tx buffer defaults to 1024 and the max value for both is 4096

**How/What to change:**

Log into the cli console of the ESX host and execute the below esxcli commands:

```
#esxcfg-nics -l      (lists all the physical NICs attached to the host)
```

```
#ethtool -g <interface name>  (shows the current ring buffer size)
```

```
#ethtool -G <interface name> rx 4096  (increases the rx buffer size to 4096)
```

```
#ethtool -G <interface name> tx 4096  (increases the tx buffer size to 4096)
```

## Multiqueue

Already enabled on ESXi for vmxnet3 adapters.

**Purpose:** Improves the network throughput of a VM.

## Advanced NUMA settings

Tuned on ESXi hosts.

**Purpose:** Prevents the ESXi scheduler to move VMs around from one NUMA node to another.

**How/What to change:**

Log into the cli console of the ESX host and execute the below esxcli commands:

```
#esxcli system settings advanced set -i=0 -o=/Numa/SwapLoadEnable
```

```
#esxcli system settings advanced set -i=0 -o=/Numa/SwapLocalityEnable
```

## Appendix I.3 Multiqueue on IPFE (OL/KVM)

To be enabled on the KVM flavor and glance image for IPFE instance.

**Purpose:** Improves the network throughput of a VM.

**How/What to change:**

You need to update the flavor and the image to enable multiqueue. All guests using that image is created with multiqueue. By default, the combined number of queues for a VM is 1. The KVM only supports a maximum of 8 queues per VM in it is TAP devices.

**Note:** The max can be increased in the VM's configuration XML but must be set to max inside the VM during runtime.

**Procedure 65. Multiqueue on IPFE (OL/KVM)**

Step No.	Procedure	Description
1. <input type="checkbox"/>	Enabling Multiqueue on IPFE:  Increase the number of multi queues	Increase the number of multi queues on the VM, by default the combined number of queues for a VM is 1.  The KVM only supports a maximum of 8 queues per VM in it's TAP devices.  <b>Note:</b> The max can be increased in the VM's configuration XML but must be set to max inside the VM during runtime.
2. <input type="checkbox"/>	List the names of all the VMs	View the list of all the VMs:  <pre>#virsh list --all</pre>
3. <input type="checkbox"/>	Open the XML configuration of the VM	Edit the XML configuration of the VM that needs to be modified for the maximum number of combined RX and TX queues.  <pre># virsh edit &lt;VM Name&gt;</pre> For example: <code>virsh edit DSRMP</code>
4. <input type="checkbox"/>	Find the XML tag for <pre>&lt;interface ..&gt; .. &lt;/interface&gt;</pre>	Find the XML tag for <code>&lt;interface ..&gt; .. &lt;/interface&gt;</code>  <b>Note:</b> Follow this process for all the interfaces in the XML.  The existing interface tag appears as below:  <pre>&lt;interface type='bridge'&gt;   &lt;mac address='52:54:00:f7:eb:7d' /&gt;   &lt;source bridge='xsi1' /&gt;   &lt;model type='virtio' /&gt;   &lt;driver name='vhost' queues='6' /&gt;   &lt;address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0' /&gt; &lt;/interface&gt;</pre>

Step No.	Procedure	Description
5. <input type="checkbox"/>	Modify the XML and add number of queues	<p>Modify the XML and add the following line to the interface.</p> <pre>&lt;driver name='vhost' queues='6' /&gt;</pre> <p>Here, 6 represents the number of queues and can be maximum upto 8.</p> <p>The updated tag appears as below:</p> <pre>&lt;interface type='bridge'&gt; &lt;mac address='52:54:00:bf:2f:a0' /&gt; &lt;source bridge='xsi1' /&gt; &lt;model type='virtio' /&gt; &lt;driver name='vhost' queues='6' /&gt; &lt;address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0' /&gt; &lt;/interface&gt;</pre>
6. <input type="checkbox"/>	Reboot the VM	Once the XML has been modified, reboot the VM for the changes to take effect.
7. <input type="checkbox"/>	Login to the VM	<p>Login to the VM using the IP or virsh console and set the number of multiqueues as required for the interfaces</p> <pre># virsh console &lt;VM Name&gt;</pre>
8.	Set the number of multiqueues	<p>List the current number of combined queues for the interface:</p> <pre>[root@DSR-Gen10-ol7 administrator]# ethtool -l eth2</pre>
9.	Verify that the Multiqueue value is set	<p>Set the number of combined queues to 6:</p> <pre># ethtool -L eth2 combined 6</pre> <p><b>Note:</b> Perform this for all the interfaces (xsi1 and xsi2). The number of combined queues can vary from 1 to the value set in the guest XML in Step 5.</p>

## Appendix I.4 Ring buffer configuration

To be enabled on the KVM flavor and glance image for ring buffer configuration.

**Purpose:** Improves the network throughput of a VM.

**How/What to change:**

**Procedure 66. Ring buffer configuration (OL/KVM)**

Step No.	Procedure	Description
1.	Ring buffer sizes are set to max on all the ether-net devices	<p>Ensure that the ring buffer sizes are set to max on all the ether-net devices on the host machine.</p> <ol style="list-style-type: none"> <li>1. Create <code>"/sbin/ifup-local"</code> file: <pre>[root@DSR-Gen10-ol7 ova]# touch /sbin/ifup-local</pre> </li> <li>2. Change the permission: <pre>[root@DSR-Gen10-ol7 ova]# chmod +x /sbin/ifup-local</pre> </li> <li>3. Change file security context: <pre>[root@DSR-Gen10-ol7 ova]# chcon --reference /sbin/ifup /sbin/ifup-local</pre> </li> </ol> <p>Add the below script to file <code>/sbin/ifup-local</code>:</p> <pre>#!/bin/bash  /sbin/ethtool -G eth0 rx 4078 tx 4078  /sbin/ethtool -G eth1 rx 4078 tx 4078  /sbin/ethtool -G eth2 rx 4078 tx 4078  /sbin/ethtool -G eth3 rx 4078 tx 4078</pre>
2.	Verify the ring buffer sizes are set to max	<p>Verify that the ring buffer sizes are set to max on all the ether-net devices on the host machine:</p> <pre># ethtool -g &lt;ethernet adapter&gt;</pre> <p>Verify the same for eth1, eth2 and eth3</p>
3.	Restart all interfaces	<p>Restart all ethernet adapter eth0, eth1, eth2,eth3, one by one, by using the following command:</p> <pre>[root@DSR-Gen10-ol7 ova]# ifdown &lt;ethernet adapter&gt;</pre> <pre>[root@DSR-Gen10-ol7 ova]# ifup &lt;ethernet adapter&gt;</pre> <p>Verify again by using above Step 37.</p>

**Appendix I.5 Disabling TSO GSO features for SBR server**

**Purpose:** To disable the TSO GSO features. This is applicable for SBR servers installed on KVM.

**How/What to change:** Run the following command to disable TSO GSO features on SBR VM:

```
ethtool -K eth<X> tso off gso off
```

After disabling the TSO GSO features, the TCP queue is cleared and replication should come up.

## Appendix J. Example Files

### Appendix J.1 Example Template File

Basic guidelines to follow while working with YAML files:

- The file must be ended with .yaml extension.
- YAML must be case-sensitive and indentation-sensitive.
- YAML does not support the use of tabs. Instead of tabs, it uses spaces.

YAML is a human-friendly data serialization standard for all programming languages.

The values of the **key:value** can be broadly classified into the following types:

Type	Description	Examples
string	A literal string.	"String param"
number	An integer or float.	"2"; "0.2"
comma_delimited_list	An array of literal strings that are separated by commas. The total number of strings should be one more than the total number of commas.	["one", "two"]; "one, two"; <b>Note:</b> "one, two" returns ["one", "two"]
json	A JSON-formatted map or list.	{"key": "value"}
boolean	Boolean type value, which can be equal "t", "true", "on", "y", "yes", or "1" for true value and "f", "false", "off", "n", "no", or "0" for false value.	"on"; "n"

### Appendix J.2 Example Parameter File

The parameter file defines the topology details. This includes all VM details such as the number of VMs, flavors, network names, etc. It is a list of key/value pairs. By referring to the **parameters** definition section in the template file, the initialization of the parameters has to be done in this section.

#### File Naming Convention

It is not mandatory to have a specific name for the file; but just to provide a self-explanatory name for the file, it is recommended to follow this convention:

**<DSR Name>\_<Site Name>\_<NetworkOam/SignallingNode>\_Params.yaml**

For example:

- dsrCloudInit\_Site00\_NetworkOam\_Params.yaml
- dsrCloudInit\_Site00\_SignalingNode\_Params.yaml

#### Sample File

##### Network OAM params file

parameters:

```
numPrimaryNoams: 1
```

numNoams: 1  
noamImage: DSR-60147  
noamFlavor: dsr.noam  
primaryNoamVmNames: ["DsrSite00NOAM00"]  
noamVmNames: ["DsrSite00NOAM01"]  
noamAZ: nova  
xmiPublicNetwork: ext-net  
imiPrivateNetwork: imi  
imiPrivateSubnet: imi-sub  
imiPrivateSubnetCidr: 192.168.221.0/24  
ntpServer: 10.250.32.10  
noamSG: Site00\_NOAM\_SG

### Signaling params file

parameters:

numSoams: 2  
numDas: 1  
numIpfes: 1  
numStps: 0  
soamImage: DSR-60147  
soamFlavor: dsr.soam  
soamVmNames: ["DsrSite00SOAM00", "DsrSite00SOAM01"]  
dalImage: DSR-60147  
daFlavor: dsr.da  
daVmNames: ["DsrSite00DAMP00", "DsrSite00DAMP01"]  
daProfileName: "VM\_30K\_Mps"  
ipfelImage: DSR-60147  
ipfeFlavor: dsr.ipfe  
ipfeVmNames: ["DsrSite00IPFE00", "DsrSite00IPFE01"]  
stpImage: none  
stpFlavor: none  
stpVmNames: none  
xmiPublicNetwork: ext-net  
imiPrivateNetwork: imi  
imiPrivateSubnet: imi-sub  
imiPrivateSubnetCidr: 192.167.2.0/24  
xsiPublicNetwork: ext-net

```
ntpServer: 10.250.32.10
soamAZ: nova
daAZ: nova
ipfeAZ: nova
stpAZ: nova
soamSG: Site00_SOAM_SG
daSG: Site00_DAMP_SG
ipfeSGs: ["Site00_IPFE_SG0", "Site00_IPFE_SG1"]
stpSG: Site00_STP_SG
primaryNoamVmName: DsrSite00NOAM00
noamXmilps: ["10.75.191.170"]
diameterTcpPorts: [3868]
diameterSctpPorts: []
stpSctpPorts:[]
```



### Network OAM params file (Fixed IP)

parameters:

numPrimaryNoams: 1  
numNoams: 1  
noamImage: DSR-8.2.0.0.0\_82.5.1.vmdk  
noamFlavor: dsr.noam  
primaryNoamVmNames: ["DsrSite00NOAM00"]  
noamVmNames: ["DsrSite00NOAM01"]  
noamAZ: nova  
primaryNoamXmilps: ["10.196.12.83"]  
noamXmilps: ["10.196.12.84"]  
noamVip: 10.196.12.85  
xmiPublicNetwork: ext-net3  
imiPrivateNetwork: imi  
imiPrivateSubnet: imi-sub  
imiPrivateSubnetCidr: 192.168.221.0/24  
ntpServer: 10.75.185.194  
noamSG: Site00\_NOAM\_SG

### Signaling params file (Fixed IP)

parameters:

numSoams: 2  
numDas: 2  
numIpfes: 1  
numStps: 0  
soamImage: DSR-8.2.0.0.0\_82.5.1.vmdk  
soamFlavor: dsr.soam  
soamVmNames: ["DsrSite00SOAM00", "DsrSite00SOAM01"]  
soamXmilps: ["10.196.12.83", "10.196.12.84"]  
soamVip: 10.196.12.86  
daProfileName: "VM\_30K\_Mps"  
dalImage: DSR-8.2.0.0.0\_82.5.1.vmdk  
daFlavor: dsr.da  
daVmNames: ["DsrSite00DAMP00", "DsrSite00DAMP01"]  
daMpXmilps: ["10.196.12.25", "10.196.12.26"]  
daMpXsilps: ["10.196.52.73", "10.196.52.74"]  
ipfelImage: DSR-8.2.0.0.0\_82.5.1.vmdk

```
ipfeFlavor: dsr.ipfe
ipfeVmNames: ["DsrSite00IPFE00", "DsrSite00IPFE01"]
ipfeXmilps: ["10.196.12.85"]
ipfeXsilps: ["10.196.52.75"]
ipfeXsiPublicIp: 10.196.52.80
stpImage: DSR-8.2.0.0.0_82.5.1.vmdk
stpFlavor: dsr.vstp
stpVmNames: ["DsrSite00STP00", "DsrSite00STP01"]
stpXmilps: ["10.196.12.29", "10.196.12.30"]
stpXsilps: ["10.196.52.77", "10.196.52.78"]
xmiPublicNetwork: ext-net3
imiPrivateNetwork: imi
imiPrivateSubnet: imi-sub
imiPrivateSubnetCidr: 192.167.2.0/24
xsiPublicNetwork: ext-net2
ntpServer: 10.250.32.10
soamAZ: nova
daAZ: nova
ipfeAZ: nova
stpAZ: nova
soamSG: Site00_SOAM_SG
daSG: Site00_DAMP_SG
ipfeSGs: ["Site00_IPFE_SG0", "Site00_IPFE_SG1"]
stpSG: Site00_STP_SG
diameterTcpPorts: [3868]
diameterSctpPorts: []
stpSctpPorts: []
```

## Appendix K. My Oracle Support (MOS)

MOS (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with MOS registration.

Call the CAS main number at **1-800-223-1711** (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request.
2. Select **3** for Hardware, Networking and Solaris Operating System Support.
3. Select one of the following options:
  - For technical issues such as creating a new Service Request (SR), select 1.

For non-technical issues such as registration or assistance with MOS, select 2.

You are connected to a live agent who can assist you with MOS registration and opening a support ticket. MOS is available 24 hours a day, 7 days a week, 365 days a year.

### Emergency Response

In the event of a critical service situation, emergency response is offered by the CAS main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

### Locate Product Documentation on the Oracle Help Center

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) site, <http://docs.oracle.com>. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at <http://www.adobe.com>.

1. Access the **Oracle Help Center** site at <http://docs.oracle.com>.
2. Click Industries.
3. Under the **Oracle Communications** subheading, click the **Oracle Communications documentation** link. The Communications Documentation page appears. Most products covered by these documentation sets display under the headings **Network Session Delivery and Control Infrastructure** or **Platforms**.
4. Click on your Product and then the Release Number. A list of the entire documentation set for the selected product and release displays. To download a file to your location, right-click the PDF link, select `Save target as` (or similar command based on your browser), and save to a local folder.