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ORACLE®

Oracle Communications API Gateway Installation Guide.

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See more information on MOS in the Appendix section.

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1. Introduction

1.1 Purpose and Scope

This document describes the installation procedures for OpenStack HEAT template.

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.

The document describes installation procedure for the following three components for DSR APIGW:

- OCSG Database Server
- OCSG Admin Server
- OCSG Application Server

1.2 References

- [1] DSR Cloud Benchmarking Guide
- [2] DSR Cloud Installation Guide
- [3] DSR API Gateway User Guide

1.3 Acronyms

Acronym	Definition
APIGW	API Gateway
CLI	Command Line Interface
KVM	Kernel-based Virtual Machine
OVA	Open Virtualization Archive
OVM-M	Oracle VM Manager
OVM-S	Oracle VM Server
OHC	Oracle Help Center
SSO	Single Sign On
YAML	Yet Another Markup Language
OCSG	Oracle communications services Gatekeeper
PEM	Privacy Enhanced Mail

1.4 General Procedure Step Format

Figure 1. Example of a procedure step illustrates the general format of procedure steps as they appear in this document. Where it is necessary to explicitly identify the server on which a particular step is to be taken, the server name is given in the title box for the step.

Each step has a checkbox for every command within the step that the technician should check to keep track of the progress of the procedure.

The title box describes the operations to be performed during that step.

Each command that the technician is to enter is in **10 point bold Courier** font.

1	<input type="checkbox"/> Login to Openstack server CLI	Login to the Openstack server though command line
---	--	---

Figure 1. Example of a procedure step

2. Overview

2.1 Prerequisites

Following are the prerequisites for installing DSR APIGW:

1. KVM/OpenStack admin and tenant privileges
2. OCSG Patches must be downloaded from mysupport (if required).
3. DSR APIGW OVA (will be used for Admin and Application Server installation)
4. The `mysql-ndbcluster-7_6_8.qcow2` (will be used for Database Server installation)
5. The **.pem** file must be available in Openstack.
6. DSR APIGW Database server must be configured and accessible from DSR APIGW Admin and Application VMs.
7. Following YAML files are required:
 - For DSR APIGW Admin/Application server: **dsrapigw.yml** and **dsrapigw_env.yml**.
8. Qemu-img tool must be available to convert VMDK to qcow2 format, if required.

3. Installation Overview

This section provides a brief overview of the recommended methods for installing the HEAT template. It also lists the procedures required for installation with estimated times.

3.1 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 in are to be executed in the order they are listed.

Installation and configuration of instances can be performed either on VMware or KVM/Openstack. On KVM/Openstack, user can install and configure instances either manually or using HEAT template. Following are the sections wherein the sequence of procedures are explained.

3.1.1 Install and Configure Instances on VMware

Following table explains the sequence to be followed on VMware:

Table 1: Install and configure instances on VMware

Procedure	Title	Description
Procedure 1	Import DSR APIGW Database and Admin/Application OVAs	Import both DSR APIGW Database, Admin and Application server OVAs
Procedure 8	MySQL NDB Cluster Installation and Configuration	Install and Configure MySQL NDB Cluster
Procedure 2	Create DSR APIGW Admin/Application servers	Create Admin and Application VMs
Procedure 9	Configure DSR APIGW Admin/Application Server	Install and configure DSR APIGW Admin/Application server

3.1.2 Install and Configure Instances on KVM/Openstack

Following table explains the sequence to be followed on KVM/Openstack:

Table 2: Install and configure instances on KVM/Openstack manually

Procedure	Title	Description
Procedure 3	Import DSR APIGW Database and Admin/Application OVAs (Openstack)	Import both DSR APIGW database, admin, application server OVAs.
Procedure 8	MySQL NDB Cluster Installation and Configuration	Install and Configure MySQL NDB Cluster
Procedure 4	Create DSR APIGW Admin/Application VMs (Openstack)	Create DSR APIGW Admin and Application VMs
Procedure 9	Configure DSR APIGW Admin/Application Server	Install and configure DSR APIGW Admin/Application server

Table 3: Install and configure instances on KVM/Openstack using Heat Template

Procedure	Title	Description
Procedure 5	Download Openstack HEAT template and parameter file	Download the template and parameter files from OHC.
Procedure 6	Create DSR APIGW Database and Admin/Application Parameter File	Create parameter file based on your configuration.
Procedure 7	Deploy DSR APIGW Database and Admin/Application using HEAT templates	Deploy the servers using HEAT template.
Procedure 8	MySQL NDB Cluster Installation and Configuration	Install and Configure MySQL NDB Cluster
Procedure 9	Configure DSR APIGW Admin/Application Server	Install and configure DSR APIGW Admin/Application

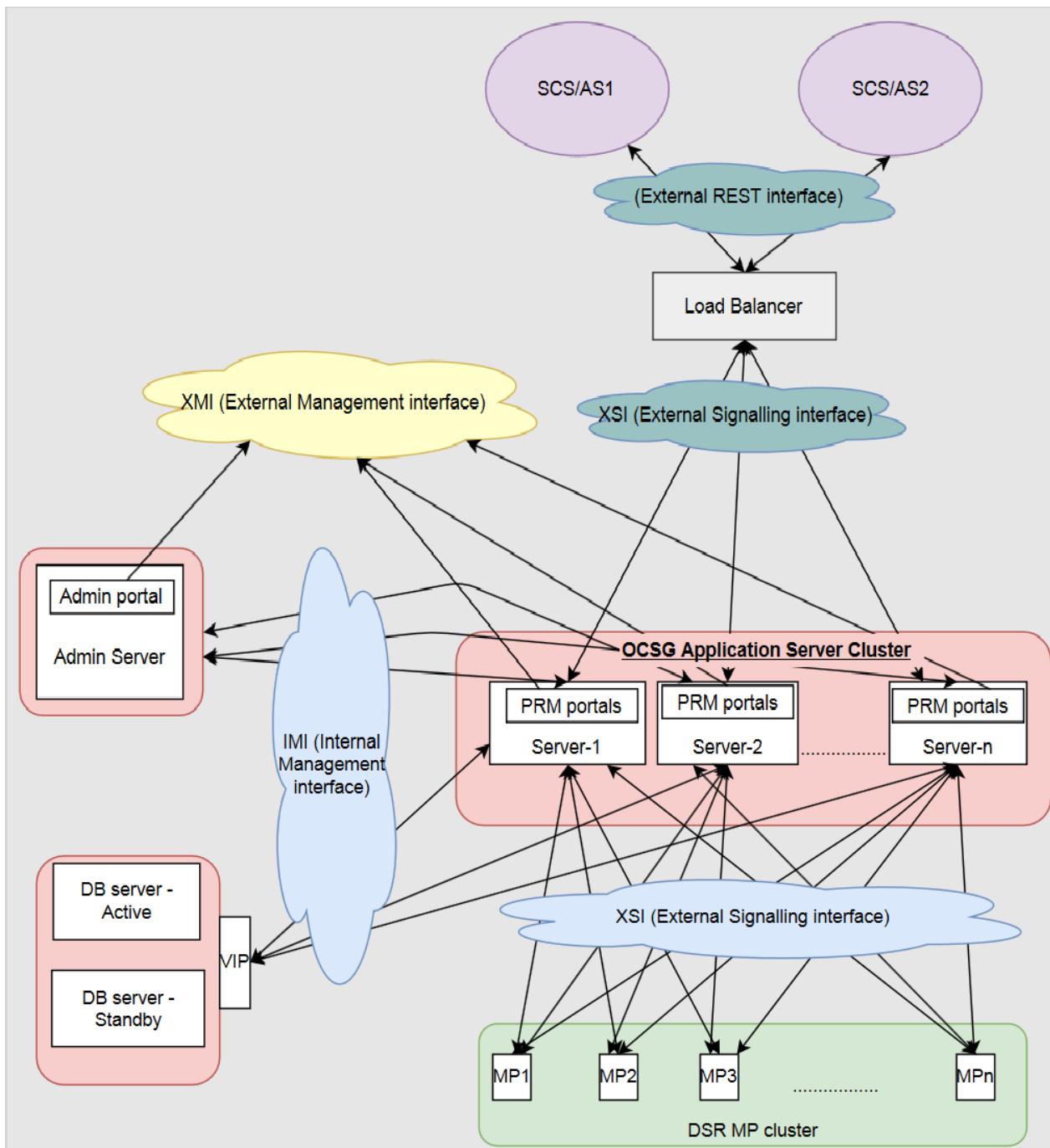
3.2 Network model

Below diagram depicts the supported network model for DSR APIGW deployments. DSR APIGW will be deployed in cluster mode and one to one mapping should be maintained between DSR site and DSR APIGW cluster.

DSR APIGW deployment model will have 3 networks:

1. XMI - External Management Interface, which will expose Administrative portal, Partner management and Partner portals. Ports 9002 will be opened for management traffic on XMI. Links to portals:
 - Admin portal - [https:<Admin-server-XMI-IP>:9002/console](https://<Admin-server-XMI-IP>:9002/console)
 - Partner management portal - [https:<AppServer-XMI-IP>:9002/portal/partner-manager/index/login.html](https://<AppServer-XMI-IP>:9002/portal/partner-manager/index/login.html)
 - Partner Portal - <https://<AppServer-XMI-IP>:9002/portal/partner/index/partnerLogin.html>
2. IMI- Internal management interface - This interface will be used within DSR APIGW cluster between DSR APIGW - Database for internal communication.
3. XSI - External Signalling interface - This interface will be used to receive and send network traffic from and to app-servers. Ports 10001 for http traffic and 10002 for https traffic on XSI interface.

Figure 2: Network Model



4. Software Installation on VMware

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)
- VMware, KVM/OpenStack admin and tenant privileges

4.1 Create Instances on VMware

4.1.1 Import DSR APIGW Database and Admin/Application OVAs (VMware)

Procedure 1. Import DSR APIGW Database and Admin/Application OVAs (VMware)

STEP #	Procedure	Description
This procedure describes steps to import the DSR APIGW Database and Admin/Application OVAs 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.		
1	<input type="checkbox"/> VMware client: Add DSR APIGW Database image	<ol style="list-style-type: none">1. Launch the VMware client of your choice.2. Add the DSR APIGW Database image to the VMware catalog or repository. Follow the instructions provided by the Cloud solutions manufacturer.
2	<input type="checkbox"/> VMware client: Add DSR APIGW Admin/Application OVA image	<ol style="list-style-type: none">1. Launch the VMware client of your choice.2. Add the DSR APIGW Admin/Application OVA image to the VMware catalog or repository. Follow the instructions provided by the Cloud solutions manufacturer.

4.1.2 Create DSR APIGW Database VMs (VMware)

Note: Refer to DSR APIGW Database section for configuring database. Refer to Configure DSR APIGW Admin/Application Server section for configuring the admin and application servers.

4.1.3 Create DSR APIGW Admin/Application VMs (VMware)

Procedure 2. Create DSR APIGW Admin/Application servers

STEP #	Procedure	Description
This procedure describes steps to create all admin and application servers.		
Note: This procedure provides an example for creating an Admin. 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.		
1 <input type="checkbox"/>	VMware client: Create the Admin VM from the OVA image	<ol style="list-style-type: none"> 1. Browse the library or repository that you placed the DSR APIGW OVA image. 2. Deploy the OVA image using vSphere Client or vSphere Web Client. 3. Name the Admin VM and select the data store.
2 <input type="checkbox"/>	VMware client: Configure resources for the Admin VM	Configure the Admin VM per the resource profiles defined in Appendix E for the DSR APIGW Admin server using the vSphere Client or vSphere Web Client . Interfaces must be added per described in Network model section.
3 <input type="checkbox"/>	VMware client: Power on Admin VM	<ol style="list-style-type: none"> 1. Power on the Admin VM with the vSphere Client or vSphere Web Client. 2. Monitor the vApps screen's Virtual Machines tab until the Admin VM reports Powered On in the Status column.
4 <input type="checkbox"/>	VMware client: Configure XMI interface	<ol style="list-style-type: none"> 1. Access the VM console via the vSphere Client or vSphere Web Client. 2. Login as the admusr user. 3. Set the ethX device: <p>Note: Where ethX is the interface associated with the XMI network.</p> <pre>\$ sudo netAdm add --device=<ethX> --address=<IP Address in External Management Network> --netmask=<Netmask> --onboot=yes --bootproto=none</pre> 4. Add the default route for ethX: <p>Note: The below step of adding gateway should be done only to the externally routable network.</p> <pre>\$ sudo netAdm add --route=default --gateway=<gateway address for the External management network> --device=<ethX></pre> 5. Ping the XMI gateway for network verification. <pre>\$ ping -c3 <Gateway of External Management Network></pre> 6. Depending on the number of instances, configuring network interfaces (step 4) should be repeated for each network (imi, XSI1, XSI2 etc.) 7. Restart network <pre>\$ service network restart</pre>

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STEP #	Procedure	Description
5 <input type="checkbox"/>	VMware client: Verify network connectivity	<ol style="list-style-type: none">1. Access the Admin VM console using the vSphere Client or vSphere web Client.2. Login as the admusr user.3. Ping the Admin. \$ ping -c3 <IP Address in External Management Network>
6 <input type="checkbox"/>	VMware client: Repeat for other Application VMs	Repeat steps 1 through 5 for the Application VMs. Use unique labels for the VM names.

5. Software Installation on KVM/Openstack

5.1 Create Instances on KVM/OpenStack Manually

5.1.1 Import DSR APIGW Database and Admin/Application OVAs (Openstack)

Procedure 3. Import DSR APIGW Database and Admin/Application OVAs (Openstack)

STEP #	Procedure	Description
<p>This procedure adds the DSR APIGW Admin/Application and Database OVA files to the glance image catalog.</p> <p>Check off (✓) each step as it is completed. Steps with shaded boxes require user input.</p> <p>If this procedure fails, contact My ORACLE Support (MOS) and ask for assistance.</p>		
<p>1 □</p> <p>Openstack Controller: Preparation</p> <p>Create instance flavors.</p>		
2 □	<p>Openstack Controller: Add DSR APIGW Database OVA image</p>	<ol style="list-style-type: none"> Copy the DSR APIGW Database OVA file from Oracle repository to the OpenStack control node. <pre>\$ scp <user_name>@<Oracle Repository server>:<path-to-OVA>/DSR-8.4.0.0.0_84.x.0.ova .</pre> <ol style="list-style-type: none"> In an empty directory, unpack the OVA file using tar. <pre>\$ tar xvf DSR-x.x.x.x.x.ova</pre> <ol style="list-style-type: none"> One of the unpacked files has a .vmdk suffix. This is the VM image file that must be imported. <p>DSR-x.x.x.x-disk1.vmdk</p> <ol style="list-style-type: none"> Source the OpenStack admin user credentials. <pre>\$. kestonerc_admin</pre> <ol style="list-style-type: none"> Select an informative name for the new image. <p>dsr-8.4.x.x.x-original</p> <ol style="list-style-type: none"> Import the image using the glance utility from the command line. <pre>openstack image create --disk-format vmdk --container-format bare --public --file dsrapigw-x.x.x.x.vmdk dsrapigw-x.x.x.x-original</pre> <p>This process takes about 5 minutes, depending on the underlying infrastructure.</p> <p>This step is complete.</p> <p>In case you want to convert vmdk file to qcow2 format, refer to Appendix F.</p> <p>Note: This process will take about 5 minutes, depending on the underlying infrastructure.</p>
3 □	<p>Openstack Controller: Add DSR APIGW OVA</p>	<p>Repeat above steps to add <code>DSRAPIGW-8.4.0.0.0_84.x.0.ova</code> DSR APIGW OVA.</p>

5.1.2 Create DSR APIGW Database VMs (Openstack)

Note: Refer to DSR APIGW Database section for configuring database. Refer to Configure DSR APIGW Admin/Application Server section for configuring the admin and application servers.

5.1.3 Create DSR APIGW Admin/Application VMs (Openstack)

Procedure 4. Create DSR APIGW Admin/Application VMs (Openstack)

Step#	Procedure	Description
This procedure describes steps to configure all VMs i.e. Admin and Application Servers.		
Note: This procedure provides an example for creating an Admin. 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.		
1 □	Openstack Controller: Name the new VM instance	<ol style="list-style-type: none"> 1. Create an informative name for the new instance: Admin. 2. Examine the interfaces must be added per described in Network model section.
2 □	Openstack Controller: Create and boot the Admin and Application VM instance from the glance image	<ol style="list-style-type: none"> 1. Get the following configuration values. <ol style="list-style-type: none"> a. The DSR APIGW Admin/Application image ID. \$ glance image-list b. The flavor ID. \$ nova flavor-list c. The network ID(s) \$ neutron net-list d. An informative name for the instance. <ul style="list-style-type: none"> • Admin • Application 1. Create and boot the VM instance. Refer to Appendix E regarding the resource profile. <p>The instance must be owned by the tenant user, not the admin user. Source the credentials of the DSR tenant user and issue the following command. Use one --nic argument for each IP/interface. Number of IP/interfaces for each VM type must confirm with the OCDSR Network to Device Assignments defined in [1].</p> <p>Note: IPv6 addresses should use the v6-fixed-ip argument instead of v4-fixed-ip.</p> <p>Admin server nova boot --image <image ID> --flavor <flavor id> --nic net-id=<XMI network id>,v4-fixed-ip=<XMI ip address> --nic net-id=<IMI network id>,v4-fixed-ip=<IMI ip address> <instance name></p> <p>App server</p>

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Step#	Procedure	Description
		<pre>nova boot --image <image ID> --flavor <flavor id> --nic net-id=<XMI network id>,v4-fixed-ip=<XMI ip address> --nic net-id=<IMI network id>,v4-fixed-ip=<IMI ip address> --nic net-id=<XSI network id>,v4-fixed-ip=<XSI ip address> <instance name></pre> <p>2. 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>
3 <input type="checkbox"/>	Openstack Controller: Check if interface is configured	<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 IP address provided with nova boot... command (step 2):</p> <pre>\$ ping <IP-Provided-During-Nova-Boot></pre> <p>If the ping is successful, ignore step 5 to configure the interface manually.</p>
4 <input type="checkbox"/>	Openstack GUI: Manually configure interface, if not already done (Optional)	<p>Note: If the instance is already configured with an interface and successfully pinging (step 4), then ignore this step to configure the interface manually.</p> <ol style="list-style-type: none"> 1. Log into the Horizon GUI as the DSR tenant user. 2. Go to the Compute/Instances section. 3. Click the Name field of the newly created instance. 4. Select the Console tab. 5. Login as the admusr user. 6. Configure the network interfaces, conforming with the Network model section. <pre>\$ sudo netAdm add --onboot=yes --device=eth0 --address=<ip> --netmask=<net mask></pre> <p>Note: The below step of adding gateway should be done only to the externally routable network.</p> <pre>\$ sudo netAdm add --route=default --device=eth0 -- gateway=<gateway ip></pre> <p>Verify network connectivity by pinging Gateway of network.</p> <pre>\$ ping -c3 <Gateway></pre> <p>Under some circumstances, it may be necessary to configure as many as 6 or more interfaces.</p> <ol style="list-style-type: none"> 7. Depending on the number of instances, configuring network interfaces (step 6) should be repeated for each network (imi, XSI1, XSI2 etc.) 8. Restart network <pre>\$ service network restart</pre> <ol style="list-style-type: none"> 9. Reboot the Admin 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 via both network and Horizon consoles.</p>

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Step#	Procedure	Description
5 <input type="checkbox"/>	Repeat for other application VMs	Repeat steps 1 through 4 for the other application VMs. Use unique labels for the VM names. Assign addresses to all desired network interfaces.

5.2 Create Instances on KVM/Openstack using Heat Template

5.2.1 Download Openstack Template and Parameter Files

Procedure 5. Download Openstack HEAT template and parameter files

Step #	Procedure	Description
<p>This procedure instructs to select required templates and environment files to be provided while deploying DSR APIGW and DSR stacks.</p> <p>Prerequisite: 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>1 <input type="checkbox"/> Login to Oracle document repository - OHC</p> <p>2 <input type="checkbox"/> Select the DSR Release</p> <p>3 <input type="checkbox"/> Download HEAT templates</p> <p>4 <input type="checkbox"/> Openstack Controller: Unzip the HEAT templates to a folder in Openstack</p> <p>5 <input type="checkbox"/> Determine the Template and Environment Files</p>		
<p>1. Login to the Oracle Document Repository. Link: http://docs.oracle.com/en/industries/communications/diameter-signaling-router/index.html</p> <p>2. Select the respective release folder Example: Release 8.4.x</p> <p>3. Login to Openstack controller and navigate to home directory where you want to store the HEAT templates. Download the HEAT Templates zip file.</p> <p>4. Create a new folder with any name for storing the heat templates, under home directory. Example : '/home/heat_templates' 2. Store the downloaded heat templates zip file in Step 3, to the above created folder. Example : '/home/heat_templates/exampleHeat.zip' 3. Unzip the downloaded heat templates. <i>unzip /home/heat_templates/exampleHeat.zip</i></p> <p>5. The HEAT templates downloaded contains files for all scenarios. Determine the appropriate template and parameter files with respect to your requirement. The YAML files for DSR APIGW admin/application servers are dsrapigw.yml and dsrapigw_env.yml.</p>		
1 <input type="checkbox"/>	Openstack Controller: Login to	Openstack Controller: Login to the Openstack controller through command line.

5.2.2 Create DSR APIGW Database and Admin/Application Parameter Files

Procedure 6. Create DSR APIGW Database and Admin/Application Parameter Files

STEP #	Procedure	Description
<p>This procedure instructs how to manually create input parameters file to be provided while deploying DSR APIGW and DSR.</p> <p>Prerequisite: 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>1 <input type="checkbox"/> Openstack Controller: Login to</p>		
<p>1 <input type="checkbox"/> Openstack Controller: Login to</p>		
1 <input type="checkbox"/>	Openstack Controller: Login to	Openstack Controller: Login to the Openstack controller through command line.

STEP #	Procedure	Description
	Openstack controller	
2 <input type="checkbox"/>	Openstack Controller: Create the parameter file	<ol style="list-style-type: none"> 1. Navigate to the folder which is already created in the above procedure for storing the templates. 2. Create an empty parameter file in this folder, following the below naming convention just to identify the purpose of the file: For DSR APIGW Admin/Application: <DSR APIGW Name>_Params.yml Example: <i>dsrapigw_Params.yml</i>
3 <input type="checkbox"/>	Openstack Controller: Sample File	<p>Refer to Appendix A for a sample file with the values.</p> <p>Note: It is important to keep the Example File handy as this will help in understanding the use of each Key Value pair which is described in the steps below while creating the Parameter File.</p>
4 <input type="checkbox"/>	Openstack Controller: Populate the parameters file as follows	<p>Refer Appendix A to create the parameter file in YAML format.</p> <p>Note: Make sure the below guidelines are followed while working with the YAML files.</p> <ul style="list-style-type: none"> • The file must end with .yaml extension. • YAML must be case-sensitive and indentation-sensitive. • YAML doesn't support the use of tabs. Instead of tabs, it uses spaces. <ol style="list-style-type: none"> 1. This file is in YAML format and it contains 'key:value' pairs 2. The first key should be 'parameters:' and then followed by the remaining required key/value pairs for the topology 3. Refer to Appendix A for all required key value pairs

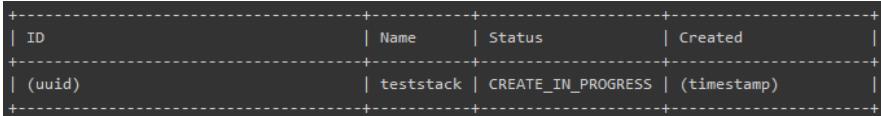
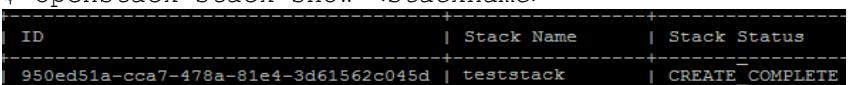
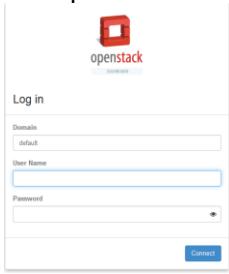
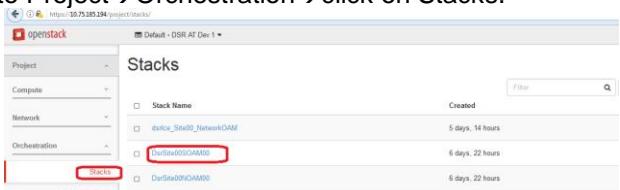
5.2.3 Deploy DSR APIGW Database and Admin/Application using HEAT Templates

This section describes the procedure to deploy DSR APIGW Database and Admin/Application using HEAT templates.

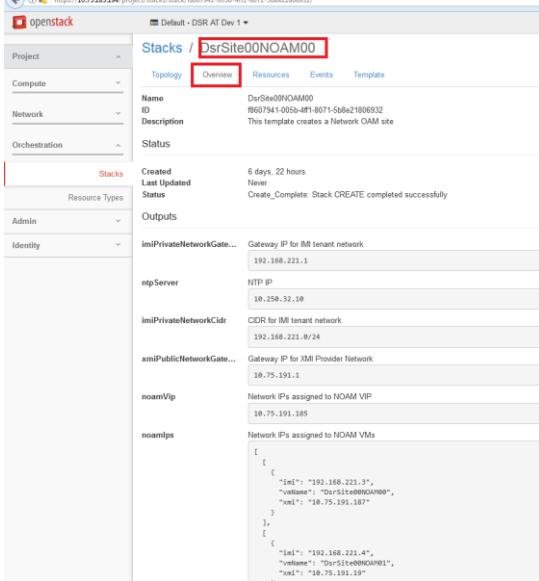
Procedure 7. Deploy DSR APIGW Database and Admin/Application using HEAT templates

STEP #	Procedure	Description
		<p>This procedure instructs how to deploy HEAT templates to create DSR APIGW admin and application stacks.</p> <p>Prerequisite: 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>
1 <input type="checkbox"/>	Openstack Controller: Login to OpenStack server CLI	If not already done, login to the OpenStack CLI
2 <input type="checkbox"/>	Openstack Controller: Prepare the input files	It is required to provide the parameter file as input while deploying the HEAT templates to create DSR APIGW admin and application stacks.

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STEP #	Procedure	Description
	required for the deployment	
3 <input type="checkbox"/>	Openstack Controller: Deploy DSR APIGW stack	<p>Execute the below OpenStack command to create DSR APIGW admin and application stack, passing the above 3 input files. Make sure the Template and Parameter files are selected with respect to DSR APIGW admin and application stack.</p> <pre>openstack stack create -e <ParameterFile.yaml> -t <TemplateFile></pre>
4 <input type="checkbox"/>	Openstack Controller: Verify the stack creation status	<p>After the OpenStack create commands are executed, execute the below command to see the stack creation status:</p> <pre>\$ openstack stack show <stackname></pre>  <p>It will take approximately 2 minutes to complete the creation. Execute the command again to verify the status</p> <pre>\$ openstack stack show <stackname></pre> 
5 <input type="checkbox"/>	Openstack Controller: Retrieve required IP's from created stacks	<p>a) Login to openstack GUI with valid credentials.</p>  <p>b) Go to Project→Orchestration→click on Stacks.</p>  <p>c) Click on the stack that you have created (<stackname>) and then click on "Overview". After clicking you can see all IP details of specific stack that is created.</p>

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STEP #	Procedure	Description
		
6 <input type="checkbox"/>	Openstack GUI: Manually configure interface, if not already done (Optional)	<ol style="list-style-type: none"> 1. Log into the openstack Horizon GUI 2. Go to the Compute/Instances section 3. Click the Name field of the newly created instance. 4. Select the Console tab 5. Login as the root user. 6. Configure the network interfaces <pre>\$ netAdm add --onboot=yes --device=eth0 --address=<xmi ip> --netmask=<xmi net mask></pre> <p>Note: The below step of adding gateway should be done only to the externally routable network.</p> <pre>\$ netAdm add --route=default --device=eth0 --gateway=<xmi gateway ip></pre> <ol style="list-style-type: none"> 7. Verify network connectivity by pinging Gateway of XMI network. \$ ping -c3 <XMI Gateway ip> 8. Depending on the number of instances, configuring network interfaces (step 6) should be repeated for each network (imi, XSI1, XSI2 etc.) 9. Restart network <pre>\$ service network restart</pre>

Note: Refer to DSR APIGW Database section for configuring database. Refer to Configure DSR APIGW Admin/Application Server section for configuring the admin and application servers.

6. DSR APIGW Database

The NDB Cluster is a technology that enables clustering of in-memory databases in a shared- nothing system. The shared-nothing architecture enables the system to work with very inexpensive hardware, and with a minimum of specific requirements for hardware or software.

The NDB Cluster is designed not to have any single point of failure. In a shared-nothing system, each component is expected to have its own memory and disk, and the use of shared storage mechanisms such as network shares, network file systems, and SANs is not recommended or supported.

The NDB Cluster integrates the standard MySQL server with an in-memory clustered storage engine called NDB (which stands for "Network DataBase").

An NDB Cluster consists of a set of computers, known as hosts, each running one or more processes. These processes, known as nodes, may include MySQL servers (for access to NDB data), data nodes (for storage of the data), one or more management servers, and possibly other specialized data access programs. When data is stored by the NDB storage engine, the tables (and table data) are stored in the data nodes. Such tables are directly accessible from all other MySQL servers (SQL nodes) in the cluster. Thus, in a payroll application storing data in a cluster, if one application updates the salary of an employee, all other MySQL servers that query this data can see this change immediately.

In addition, a MySQL server that is not connected to an NDB Cluster cannot use the NDB storage engine and cannot access any NDB Cluster data.

The data stored in the data nodes for NDB Cluster can be mirrored; the cluster can handle failures of individual data nodes with no other impact than that a small number of transactions are aborted due to losing the transaction state. Because transactional applications are expected to handle transaction failure, this should not be a source of problems.

Individual nodes can be stopped and restarted, and can then rejoin the system (cluster). Rolling restarts (in which all nodes are restarted in turn) are used in making configuration changes and software upgrades.

6.1 Install and Configure MySQL NDB Cluster

Procedure 8. MySQL NDB Cluster Installation and Configuration

STEP#	Procedure	Description
<p>This procedure installs and configures the MySQL NDB Cluster. 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"/>	Bring up VM's with mysql image	NDB Cluster has minimum of 6 VM's: 2 VM's for Management Node, 2 VM's for Data Node, 2 VMs for SQL Node.
2. <input type="checkbox"/>	SSH to VM's with pem file	SSH to VM's with pem file, by executing: <code># ssh -i <pem file> root@ipaddress of vm</code>
3. <input type="checkbox"/>	Set the password for root	Set the password for root, by executing: <code>passwd</code>
4. <input type="checkbox"/>	Disable the firewall	Disable the firewall on all nodes, by executing: <code>systemctl disable firewalld</code>

STEP#	Procedure	Description
5. □	Update config.ini file	<p>Update config.ini file on all management nodes and on all data nodes under the location /var/lib/mysql-cluster to provide correct ipaddresses of all nodes. Modify DataMemory parameter on all management nodes and data nodes as per the suggestion provided in the below sample file:</p> <pre> [ndb_mgmd] #Management Node1 db1 NodeId=1 HostName=<Ipaddress of Management Node1> [ndb_mgmd] #Management Node2 NodeId=2 HostName=<Ipaddress of Management Node2> [ndbd default] NoOfReplicas=2 # Number of replicas DataMemory=3072M # Memory allocate for data storage. Assuming data node is having 4GB RAM. If 64GB RAM profile is used for data nodes , please change it to 48GB. Suggested to use Maximum of 75% of your RAM. IndexMemory=384M # Memory allocate for index storage. Assuming data node is having 4GB RAM. If 64GB RAM profile is used for data nodes, please change it to 6144M. Suggested to use Maximum of 9.375% of your RAM. #Directory for Data Node DataDir=/var/lib/mysql-cluster MaxNoOfAttributes=1000000 StopOnError=0 #<Some more parameters will go here. Verify in corresponding nodes.> [ndbd] #Data Node 1 NodeId=3 HostName=<Ipaddress of Data Node1> </pre>

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STEP#	Procedure	Description
		<pre>[ndbd] #Data Node 2 NodeId=4 HostName=<Ipaddress of Data Node2> [mysqld] NodeId=5 HostName=<Ipaddress of SQL Node1> #SQL Node1 [mysqld] NodeId=6</pre>
6. <input type="checkbox"/>	Disable and stop mysqld process	<p>Disable & stop mysqld process running on all datanodes, by executing:</p> <pre>systemctl disable mysqld systemctl stop mysqld</pre>
7. <input type="checkbox"/>	Update my.cnf file on data nodes	<p>Update my.cnf file on all data nodes, by executing:</p> <pre>vi /etc/my.cnf [mysqld] # This section already exists, so just add from below lines to my.cnf file max_connections = 350 wait_timeout = 300 interactive_timeout = 300 ndbcluster ndb-connectstring=<Ip Address1 of Mgmt Node>,<Ip Address2 of Mgmt Node> [mysql_cluster] ndb-connectstring=<Ip Address1 of Mgmt Node>,<Ip Address2 of Mgmt Node></pre> <p>Note: Make sure to update the actual Ip addresses of management nodes.</p>
8. <input type="checkbox"/>	Update my.cnf file	Update my.cnf file on all SQL nodes as following:

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STEP#	Procedure	Description
	on SQL nodes	<pre>vi /etc/my.cnf</pre> <p>[mysqld]# This section already exists, so just add from below lines to my.cnf file</p> <pre>max_connections = 350</pre> <pre>wait_timeout = 300</pre> <pre>interactive_timeout = 300</pre> <pre>ndbcluster</pre> <pre>ndb-connectstring=<Ip Address1 of Mgmt Node>,<Ip Address2 of Mgmt Node># IP address for server management node</pre> <pre>default_storage_engine=ndbcluster# Define default Storage Engine used by MySQL</pre> <pre>[mysql_cluster]</pre> <pre>ndb-connectstring=<Ip Address1 of Mgmt Node>,<Ip Address2 of Mgmt Node># IP address for server management node</pre> <p>Note: Make sure to update the actual Ip addresses of management nodes.</p>
9. <input type="checkbox"/>	Connect SQL node to data node	Execute the following command on all SQL nodes to connect the SQL nodes to Data node: <pre>rm -f /var/lib/mysql-cluster/config.ini</pre>
10. <input type="checkbox"/>	Restart the MySQL service	Restart the MySQL service on all SQL nodes, by executing: <pre>systemctl start mysqld</pre> <pre>systemctl enable mysqld</pre>
11. <input type="checkbox"/>	Configure root password on all the SQL nodes	Get the temporary password that is required in the next step, by executing: <pre>grep 'temporary' /var/log/mysqld.log</pre>
12. <input type="checkbox"/>	Set the MySQL credentials	Set the MySQL credentials by executing the following command and provide the password for the root user obtained from the previous step and provide new password on all SQL nodes: <pre>mysql_secure_installation</pre> <p>Note: Please make note of the password set for mysql during this process.</p> <pre>[root@vmdk-datanode ~]# mysql_secure_installation</pre> <p>Reset the password and answer the following questions as suggested:</p> <pre>Change the password for root ? ((Press y Y for Yes, any other key for No) : y</pre>

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STEP#	Procedure	Description
		<p>Do you wish to continue with the password provided? (Press y Y for Yes, any other key for No) : y</p> <p>Remove anonymous users? (Press y Y for Yes, any other key for No) : y</p> <p>Disallow root login remotely? (Press y Y for Yes, any other key for No) : n</p> <p>Remove test database and access to it? (Press y Y for Yes, any other key for No) : n</p> <p>Reload privilege tables now? (Press y Y for Yes, any other key for No) : y</p> <p>Once all the questions are answered, the following message is displayed:</p> <p>Success & All Done</p>
13. <input type="checkbox"/>	Login to MySQL	<p>Login to MySQL, by executing:</p> <pre>mysql -u root -p</pre> <p>Note: Use the configured password for the root user.</p>
14. <input type="checkbox"/>	Create a new user	<p>Create a new user, by executing:</p> <pre>CREATE USER 'mysqluser'@'localhost' IDENTIFIED BY '<newpasswordhere>';</pre> <p>Here a user named <code>mysqluser</code> is created provided with necessary grants.</p> <p>Note: Any username of your choice can be created but changes need to be made accordingly for all commands provided in further steps. It is suggested to create same username on all SQL nodes.</p>
15. <input type="checkbox"/>	MySQL user password should never be expired	<p>Set the MySQL user password to never expire, by executing:</p> <pre>ALTER USER 'mysqluser'@'localhost' PASSWORD EXPIRE NEVER;</pre>
16. <input type="checkbox"/>	Create database gatekeeper	<p>Create database gatekeeper, by executing:</p> <pre>CREATE DATABASE gatekeeper;</pre>
17. <input type="checkbox"/>	Grant privileges	<p>Grant privileges to the newly created user, by executing:</p> <pre>GRANT ALL PRIVILEGES ON gatekeeper.* TO 'mysqluser'@'%' Identified By '<newpasswordhere>'; FLUSH PRIVILEGES; EXIT;</pre>
18. <input type="checkbox"/>	Login to mysql	<p>Login to mysql with the newly created user and provide the corresponding password, by executing:</p>

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STEP#	Procedure	Description
		<pre>mysql -u mysqluser -p</pre>
19. <input type="checkbox"/>	Check visibility of gatekeeper database	Check that the gatekeeper database is visible, by executing: SHOW DATABASES;
20. <input type="checkbox"/>	Verify on all SQL nodes	Make sure that steps applicable for SQL node are followed on all SQL/API nodes, such as from steps 9 to 18.
21. <input type="checkbox"/>	Initialize ndb_mgmd process	To initialize the <code>ndb_mgmd</code> process on all NDB management nodes, execute: <code>sudo chmod +x /etc/init.d/ndb_mgmd</code> <code>chkconfig --add ndb_mgmd</code> <code>service ndb_mgmd start</code>
22. <input type="checkbox"/>	Start <code>ndbd</code> process	To start <code>ndbd</code> process on all the data nodes, execute: <code>sudo chmod +x /etc/init.d/ndbd</code> <code>chkconfig --add ndbd</code> <code>service ndbd start</code>
23. <input type="checkbox"/>	Restart all the VM's of the NDB cluster	Restart all the VM's of the NDB cluster. Once all the VM's are up and available then the NDB Cluster should be working fine. But make sure management node's are started first before data nodes and SQL nodes. It would be good to follow the order of VM's restart, Management nodes → Data Nodes → SQL Nodes . Verify that cluster is up and running as per specified in the next step.
24. <input type="checkbox"/>	Check the other node status from NDB management	Check the status of other nodes from the NDB management node, by executing: <code>ndb_mgm> show</code>
25. <input type="checkbox"/>	Create tables on NDBCluster SQL node1	Create tables on NDBCluster SQL node1 as below: SSH to SQL Node VM as root and scp the provided schema (<code>gatekeeper.sql</code>) file to the current folder location. Enter the command: <code>mysql -u <new mysql user> -p gatekeeper < schemafile</code> Provide the new mysql user password at prompt. Example: <code>mysql -u mysqluser -p gatekeeper < gatekeeper.sql</code>

STEP#	Procedure	Description
		<p>The <code>mysqluser</code> in the above example has to be replaced with appropriate new user created for mysql.</p> <p>Verify that all 85 tables are created.</p>
26.	Create stored procedure on all SQL nodes	<p>Create the required stored procedure on all SQL nodes as below:</p> <pre>mysql -u mysqluser -p gatekeeper < scef_apn_rate_control_sp.sql</pre> <p>Note: Copy the <code>gatekeeper.sql</code> and <code>scef_apn_rate_control_sp.sql</code> to Database SQL Nodes that are available in Admin/AppServer VMs under the location <code>/u02/app/oracle/scripts/</code>.</p>
27.	Grant required permission	<p>SSH to all SQL nodes as root and grant the required permissions, by executing:</p> <pre>mysql -u root -p GRANT SELECT ON mysql.proc TO 'mysqluser'@'%';</pre>
28.	Remove the file <code>auto.cnf</code> and restart all the SQL nodes	<p>SSH to all SQL nodes to remove the file <code>/var/lib/mysql/auto.cnf</code> by executing below command and restart all SQL node VMs :</p> <pre>rm -f /var/lib/mysql/auto.cnf</pre>

7. Configure DSR APIGW Admin/Application Server

Procedure 9. Configure DSR APIGW Admin/Application Server

STEP #	Procedure	Description
This procedure describes to install and configure DSR APIGW Admin and Application Servers.		
Prerequisite: All the respective infrastructures has to be up and running		
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 □	Copy the .pem file (key-pair) used to create the VMs to Admin server in any location.	<ol style="list-style-type: none"> 1. Login to Openstack controller console 2. Copy the pem file from the opentack controller to the Admin server in any location, by executing: <code>\$ scp -i /root/dsr-keypair.pem /root/ dsr-keypair.pem admusr@<adminserverip>:/u02</code> <p>Note: PEM certificates are frequently used for web servers as they can easily be translated into readable data using a simple text editor. Generally when a PEM encoded file is opened in a text editor, it contains very distinct headers and footers. Refer to Appendix C for creating a PEM file.</p>
2 □	Login to the Admin server and fill in the <code>ocsg.properties</code> file with all required input data for the script	<ol style="list-style-type: none"> 1. Login to Admin server 2. Navigate to <code>/u02/app/oracle/scripts/</code> <code>\$ cd /u02/app/oracle/scripts/</code> 3. Edit the file <code>ocsg.properties</code>. Add respective property values in the file. <p>Refer to Appendix B for more information on properties and its parameters.</p>
3 □	Modify database details in <code>dsrapigw_default_params.rsp</code>	<ol style="list-style-type: none"> 1. Login to Admin server and all App servers 2. Navigate to <code>/u02/app/oracle/scripts/</code> <code>\$ cd /u02/app/oracle/scripts/</code> 3. Edit the file <code>dsrapigw_default_params.rsp</code>. Modify the following parameters: <code>DATABASE_USER_NAME=<provide mysql user created while configuring database. Ex:mysqluser></code> <code>DATABASE_USER_PASSWORD=<provide password of above mentioned user></code> <code>DATABASE_HOST_NAME=<ipaddress of sqlnode1></code> <code>DATABASE_PORT=3306</code>
4 □	Execute the script	<p>Execute the script from the Admin server:</p> <ol style="list-style-type: none"> 1. Login to Admin server 2. Navigate to <code>/u02/app/oracle/scripts</code> 3. Execute <code>python configureOCSGSingleTier.py</code>
5 □	Monitor the screen or verify the log file for success	From Admin server, verify the logs as follows: <ol style="list-style-type: none"> 1. Login to Admin server

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STEP #	Procedure	Description
		<p>2. Navigate to /u02/app/oracle/scripts 3. Execute vim ocsig_install.log</p> <p>Note: The log file name is configured in the ocsig.properties file. Installation takes few mins to complete, and a message "DSR APIGW Configuration Successful" is displayed, upon completion.</p> <pre>##### DSR API Gateway Configuration Succesful! ##### Installation folder : /u03/app/oracle/ocsig-18.2.5/ Admin GUI Interface can be accessed at http://10.75.242.246:7001/console/ Partner GUI Interface can be accessed at http://10.75.242.247:8001/portal/partner-manager/index/ ##### DSR API Gateway Configuration Succesful! ##### [admusr@dsrapigwapp-0 scripts]\$</pre>
6 <input type="checkbox"/>	Verify the interface accessibility	Verify the interface accessibility by opening the GUI Interface IP in a browser window. Refer to Network model for the port information.
7 <input type="checkbox"/>	Move the mentioned files on all Appservers using the provided commands	<p>SSH to all Appservers one by one, navigate to /u03/app/oracle/ocsig-18.3.1/ocsig/store_schema and run below commands to rename the corresponding files :</p> <ul style="list-style-type: none"> o sudo mv ocsig_app_custom_ipdevice_com.oracle.ocsig.custom.ipdevicehandler.store.xml ocsig_app_custom_ipdevice_com.oracle.ocsig.custom.ipdevicehandler.store.xml_bak o sudo mv ocsig_app_custom_ipdevice_com.oracle.ocsig.custom.ipdevicehandler.store.jar ocsig_app_custom_ipdevice_com.oracle.ocsig.custom.ipdevicehandler.store.jar_bak o sudo mv oracle.ocsig.scef.mqtt.broker.plugin.store_1.0.jar oracle.ocsig.scef.mqtt.broker.plugin.store_1.0.jar_bak o sudo mv oracle.ocsig.scef.mqtt.broker.store.xml oracle.ocsig.scef.mqtt.broker.store.xml_bak
8 <input type="checkbox"/>	Copy required files from Admin VM to Appserver VM's	<p>SSH to Admin and run the following commands by providing ipaddress of appserver one by one to copy jars slf4j-api-1.7.25.jar log4j-slf4j-impl.jar, ipdevice handler related jar from /u02/app/oracle/scripts to /u03/app/oracle/ocsig-18.3.1/user_projects/domains/services-gatekeeper-domain/lib to all appservers using below commands from OCSG Admin VM:</p> <pre>→ scp /u02/app/oracle/scripts/slf4j-api-1.7.25.jar admusr@APP SERVER-IP's:/u03/app/oracle/ocsig-18.3.1/user_projects/domains/services-gatekeeper-domain/lib/ → scp /u02/app/oracle/scripts/log4j-slf4j-impl.jar admusr@APP SERVER-IP's:/u03/app/oracle/ocsig-18.3.1/user_projects/domains/services-gatekeeper-domain/lib/ → scp /u02/app/oracle/scripts/ocsig_app_custom_ipdevice_com.or</pre>

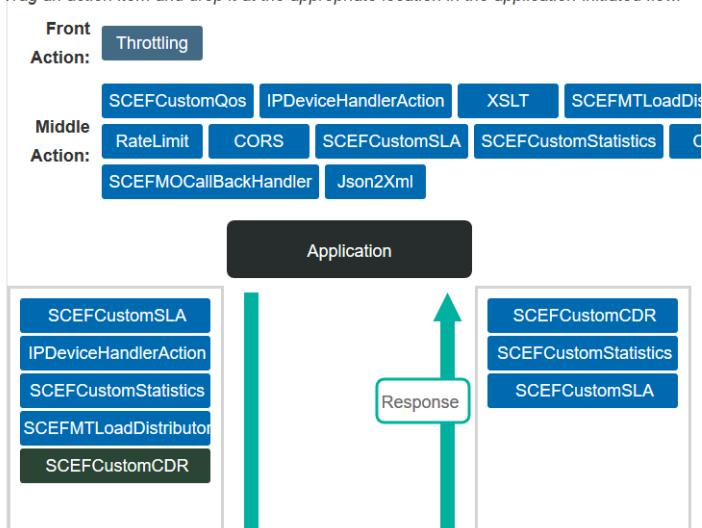
STEP #	Procedure	Description
		<pre>acle.ocsg.custom.ipdevicehandler.store.jar admusr@APP SERVER-IP's: /u03/app/oracle/ocsg- 18.3.1/user_projects/domains/services-gatekeeper- domain/lib/</pre> <p>Note: Replace the APP SERVER-IP's with actual appserver ip's and run the commands.</p>
9 <input type="checkbox"/>	Update EDR descriptor on Admin Webconsole login	<p>Update EDR descriptor XML on admin weblogic console:</p> <ol style="list-style-type: none"> Navigation to: Admin Weblogic Console → Domain Structure → OCSSG → EDR Configuration → EDR descriptor Click the Lock & Edit button on the left hand side in the top corner In the Change Center section: <ol style="list-style-type: none"> Under edr-config tag, update the following xml content as shown below in the screenshot: <pre><edr id="75003" description="PrefixTreeEDR"><filter><method><name>oracle.ocsg.daf.custom.action.customsla.util.TopicPrefixEdrHelper.publish</name><class>oracle.ocsg.daf.custom.action.customsla.util.TopicPrefixEdrHelper</class></method></filter></edr></pre>  Click Save.
10 <input type="checkbox"/>	Update CDR descriptor on Admin Webconsole login	<p>After completing the above step, scroll down on the same page,</p> <ol style="list-style-type: none"> Navigate to CDR Descriptor → Under cdr-config tag Update the provided content below and click on Save. <pre><cdr id="75002"><filter><method><name>oracle.ocsg.scef.mqtt.broker.cdr.MqttCDRHelper.logMqttCdr</name><class>oracle.ocsg.scef.mqtt.broker.cdr.MqttCDRHelper</class></method></filter></cdr> <cdr id="75004"><filter><method><name>com.oracle.ocsg.custom.ipdevicehandler.mqttdcdr.MqttCDRHelper.logMqttCdr</name><class>com.oracle.ocsg.custom.ipdevicehandler.mqttdcdr.MqttCDRHelper</class></method></filter></cdr></pre> <p>Refer the following screenshot:</p>

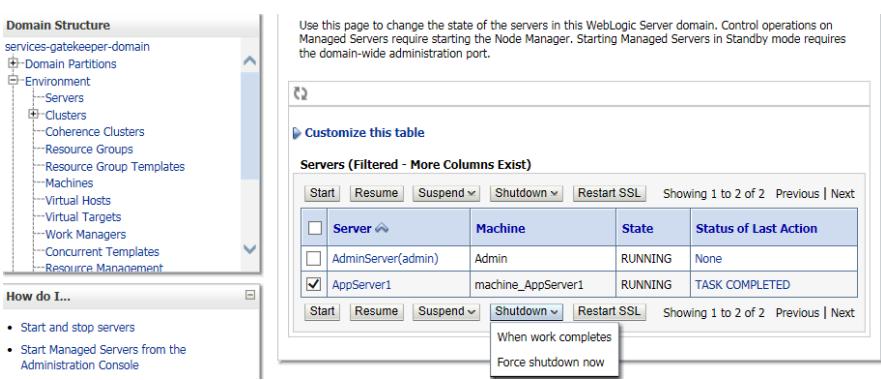
STEP #	Procedure	Description
		<pre> CDR descriptor: <!-- WLN 2.2 generated CDR will have method = "logChargingInfo" --> <filter id="75002"><method>logMqttCdr</method></filter> <filter id="75004"><method>logMqttChargingInfo</method></filter> <!-- WLN 2.2 generated CDR will have method = "logChargingInfo" --> <filter id="75997"> <method>logMqttCdr</method> <!-- WLN 2.2 generated CDR will have method = "logChargingInfo" --> <filter id="75998"> <method>logMqttChargingInfo</method> </pre>
11 <input type="checkbox"/>	Activate changes	Click on Activate changes button on the left hand side in the top corner of the Change Center section in Admin Webconsole after completing the above step.
12 <input type="checkbox"/>	Addition in Log4j2config.xml file on all Appservers	<p>SSH to all appserver VM's:</p> <p>Navigate to <code>/u03/app/oracle/ocsg-18.3.1/user_projects/domains/services-gatekeeper-domain/log4j/log4j2config.xml</code> under Loggers tag section and add the following content:</p> <pre> <Logger additivity="false" level="off" name="io.moquette"> <AppenderRef ref="trace" /> </Logger> </pre>
13 <input type="checkbox"/>	Modify Log4j2config.xml on all Appservers	<p>Modify <code>log4j2config.xml</code> in all AppServers to change the status from <code>trace</code> to <code>info</code>:</p> <p>Change the following configuration:</p> <pre> <Configuration monitorInterval="5" packages="oracle.ocsg.daf.custom.action.customlog4j" status="trace"> </pre> <p>to,</p> <pre> <Configuration monitorInterval="5" packages="oracle.ocsg.daf.custom.action.customlog4j" status="info"> </pre> <p>This xml file is available under the location: <code>/u03/app/oracle/ocsg-18.3.1/user_projects/domains/services-gatekeeper-domain/log4j</code></p> <p>After the above change is done on all AppServers, restart all AppServers from the Admin console:</p> <p><code>https://<floating ip of admin server>:9002/console/login/LoginForm.jsp</code></p>

STEP #	Procedure	Description
14 <input type="checkbox"/>	Copy file from Admin VM to all Appserver VM's	<p>SSH to Admin VM, Copy /u02/app/oracle/scripts/SCEF-Binary-Layout.jar from Adminserver to all Appservers, by executing:</p> <pre>scp /u02/app/oracle/scripts/SCEF-Binary-Layout.jar admusr@<APP SERVER IP>:/u03/app/oracle/ocsg- 18.3.1/user_projects/domains/services-gatekeeper- domain/lib</pre> <p>Note: Replace the APP SERVER-IP's with actual appserver ip's before executing the command.</p>
15 <input type="checkbox"/>	Install new AAA ear as below	<p>Login to Admin Weblogic server</p> <ol style="list-style-type: none"> 1. Navigate to Domain Structure → Deployments 2. Click on Lock & Edit button on the left hand side in the top corner <p>In the Change Center section:</p> <ol style="list-style-type: none"> a. Click Install b. Deploy the new version of ear file from the /u02/app/oracle/scripts/SCEF_AAA_Provisioning.ear and click Next. c. Choose "Install this deployment as an application" and click Next. d. Under Clusters , keep the check in the Checkbox against "WLNG_SINGLETIER_Cluster" and click Next. <p>Note: Do not change anything, click Next and Finish at the end.</p> <ol style="list-style-type: none"> e. Click Activate changes on the left hand side in the top corner of the Change Center section. f. If in case, the state of new deployment "SCEF_AAA_Provisioning" is in Prepared state. Click on this deployment and navigate to Control tab. g. Keep the check in the Checkbox against the deployment and click Start button to change it in Active state.
16 <input type="checkbox"/>	Rename existing jars and copy new jars required for PSK support in MQTT on Adminserver	<p>SSH to Adminserver,</p> <p>Rename the existing jars and copy the new jars required for PSK support in MQTT on the Adminserver, by executing:</p> <ul style="list-style-type: none"> o cd /u03/app/oracle/ocsg- 18.3.1/oracle_common/modules/ o mv org.bouncycastle.bcprov-ext-jdk15on.jar org.bouncycastle.bcprov-ext-jdk15on.jar1 o mv org.bouncycastle.bcprov-jdk15on.jar org.bouncycastle.bcprov-jdk15on.jar1 o mv org.bouncycastle.bcpkix-jdk15on.jar org.bouncycastle.bcpkix-jdk15on.jar1 o cp /u02/app/oracle/scripts/bcprov-ext- jdk15on-161.jar . o cp /u02/app/oracle/scripts/bcprov-jdk15on- 161.jar . o cp /u02/app/oracle/scripts/bcpkix-jdk15on- 161.jar .
17 <input type="checkbox"/>	Copy required files from	<p>SSH to Adminserver, copy new jars into all appservers required for PSK support in MQTT from the Adminserver (to be repeated for all appservers), by executing:</p>

STEP #	Procedure	Description
	Adminserver to all Appservers	<ul style="list-style-type: none"> o scp /u02/app/oracle/scripts/bcprov-ext-jdk15on-161.jar admusr@<APP SERVER IP>:/u03/app/oracle/ocsg-18.3.1/oracle_common/modules/ o scp /u02/app/oracle/scripts/bcprov-jdk15on-161.jar admusr@<APP SERVER IP>:/u03/app/oracle/ocsg-18.3.1/oracle_common/modules/ o scp /u02/app/oracle/scripts/bcpkix-jdk15on-161.jar admusr@<APP SERVER IP>:/u03/app/oracle/ocsg-18.3.1/oracle_common/modules/ <p>Note: Replace the APP SERVER-IP's with the actual appserver ip's before executing the command.</p>
18 <input type="checkbox"/>	Rename mentioned jars on all Appservers	<p>SSH to all appservers to rename the existing jars:</p> <pre>cd /u03/app/oracle/ocsg-18.3.1/oracle_common/modules/ o mv org.bouncycastle.bcprov-ext-jdk15on.jar org.bouncycastle.bcprov-ext-jdk15on.jar1 o mv org.bouncycastle.bcprov-jdk15on.jar org.bouncycastle.bcprov-jdk15on.jar1 o mv org.bouncycastle.bcpkix-jdk15on.jar org.bouncycastle.bcpkix-jdk15on.jar1</pre>
19 <input type="checkbox"/>	Open 5656 port on firewall on all Appservers	<p>SSH to all the app servers, and unblock the port 5656, by executing:</p> <pre>sudo iptablesAdm append --type=rule --protocol=IPv4 -- domain=0ldsrapigw --table=filter --chain=INPUT -- match=' -m state --state NEW -m tcp -p tcp --dport 5656 -d <XSI Ipaddress of AppserverX> -j ACCEPT' -- persist=yes</pre> <p>Note: This step must be repeated on all appservers by replacing the highlighted one's with the actual ip.</p>
20 <input type="checkbox"/>	Open 1883 port on firewall on all Appservers	<p>SSH to all app servers, and unblock the port 1883, by executing:</p> <pre>sudo iptablesAdm append --type=rule --protocol=IPv4 -- domain=0ldsrapigw --table=filter --chain=INPUT -- match=' -m state --state NEW -m tcp -p tcp --dport 1883 -d <XSI Ipaddress of AppserverX> -j ACCEPT' -- persist=yes</pre> <p>Note: This step must be repeated on all appservers by replacing the highlighted one's with the actual ip.</p>
21 <input type="checkbox"/>	Open 3868 port on firewall on all Appservers	<p>SSH to all app servers, and unblock the port 3868, by executing:</p> <pre>sudo iptablesAdm append --type=rule --protocol=IPv4 -- domain=0ldsrapigw --table=filter --chain=INPUT -- match=' -m state --state NEW -m tcp -p tcp --dport 3868 -d <XSI Ipaddress of AppserverX> -j ACCEPT' -- persist=yes</pre>

API Gateway Installation Guide

STEP #	Procedure	Description
		<p>Note: This step to be repeated on all appservers.</p>
22 <input type="checkbox"/>	Login to partner manager portal to keep action in order	<p>Login to partner manager portal (<a href="https://<Appserver1_Ipaddress>:9002/portal/partner-manager/index/login.html">https://<Appserver1_Ipaddress>:9002/portal/partner-manager/index/login.html)</p> <ol style="list-style-type: none"> 1. Navigate to APIs. 2. On monitoring-events and nidd api's <ol style="list-style-type: none"> a. Click on the corresponding api and navigate to Actions tab. <p>Note: The order of actions must be as per the screenshot below:</p> <ul style="list-style-type: none"> o Change required is on the order of IPDeviceHandlerAction on Request side (left hand side) from 4th to 2nd. To make this change drag the IPDeviceHandlerAction to 2nd position and click on Save button available at the bottom of the page. o Other change is to drag the SCEFCustomSLA action from Middle Action section to the Response side (right hand side), if incase it is not available then provide any unique number under Instance Id field in the new section that appears after dragging the required action. <p><i>Drag an action item and drop it at the appropriate location in the application-initiated flow.</i></p> 
23 <input type="checkbox"/>	Take backup of data on SQL node1	<p>On the SQL node1, take the backup of data, by executing:</p> <pre>mysqldump -h <Ipaddress of SQL Node1> -u <mysql username> -p<Password> --databases gatekeeper > gatekeeper_data.sql</pre> <p>Replace with actual details before running the command.</p>
24 <input type="checkbox"/>	Restart all Appservers from Admin Weblogic console	<p>Bring down all the Appservers from Admin web console.</p> <p>Navigate to AdminConsole → Domain Structure → Environment → Servers → Control (Tab)</p> <p>Choose only Appservers, then shut them down and restart.</p>

STEP #	Procedure	Description
		<p>Steps to Restart AppServers:</p> <ol style="list-style-type: none"> 1. Log into the Admin console. 2. From the side menu, navigate to Domain Structure > Environment > Servers. 3. From the Control tab, check the checkboxes next to each AppServer and click Shutdown > Force shutdown now.  <p>4. Click Yes to confirm.</p> <p>5. Wait until the state of all AppServer changes to SHUTDOWN.</p> <p>6. Check the checkboxes next to each AppServer and click Start.</p> <p>7. Click Yes to confirm.</p>

8. Multi Data Source Creation

1. Shutdown all the App servers.
2. Click **Lock & Edit** option on the left hand side of the **Change Center** section in the Admin (Weblogic) console.
3. Navigate to Data source page, **Domain Structure** → **Services** → **Data Sources**.
4. Create data source named `wlng.datasource1` by clicking on **New** in the section "**Data Sources** (Filtered - More Columns Exist)" and select the option "**Generic Data Source**". Provide **Name**, **JNDI Name** & select **Database Type** as shown in the screen below and click **Next**.

Create a New JDBC Data Source

JDBC Data Source Properties

The following properties will be used to identify your new JDBC data source.
* Indicates required fields

What would you like to name your new JDBC data source?

Name: `wlng.datasource1`

What scope do you want to create your data source in ?

Scope: `Global`

What JNDI name would you like to assign to your new JDBC Data Source?

JNDI Name:
`wlng.datasource1`

What database type would you like to select?

Database Type: `MySQL`

Back **Next** **Finish** **Cancel**

5. Select **Database Driver** as shown in the screen below and click **Next**:

Create a New JDBC Data Source

JDBC Data Source Properties

The following properties will be used to identify your new JDBC data source.

Database Type: `MySQL`

What database driver would you like to use to create database connections? Note: * indicates that the driver is explicitly supported by Oracle WebLogic Server.

Database Driver: `MySQL's Driver (Type 4) Versions:using com.mysql.jdbc.Driver`

Back **Next** **Finish** **Cancel**

6. Check the box against "**Supports Global Transactions**", and the **One-phase Commit** option would be auto selected, then click **Next**.

API Gateway Installation Guide

Create a New JDBC Data Source

Transaction Options

You have selected non-XA JDBC driver to create database connection in your new data source.

Does this data source support global transactions? If yes, please choose the transaction protocol for this data source.

Supports Global Transactions

Select this option if you want to enable non-XA JDBC connections from the data source to participate in global transactions using the *Logging Last Resource (LLR)* transaction optimization. Recommended in place of Emulate Two-Phase Commit.

Logging Last Resource

Select this option if you want to enable non-XA JDBC connections from the data source to emulate participation in global transactions using JTA. Select this option only if your application can tolerate heuristic conditions.

Emulate Two-Phase Commit

Select this option if you want to enable non-XA JDBC connections from the data source to participate in global transactions using the one-phase commit transaction processing. With this option, no other resources can participate in the global transaction.

One-Phase Commit

7. Provide **Database Name** as "gatekeeper", **Host Name** as "Ip of SQL Node1", **Port** as "3306", **Database User Name** is the new user name created while configuring SQL on SQL node1 during MySQL setup creation. Provide the corresponding password and click **Next**.

Create a New JDBC Data Source

Connection Properties

Define Connection Properties.

What is the name of the database you would like to connect to?

Database Name:

What is the name or IP address of the database server?

Host Name:

What is the port on the database server used to connect to the database?

Port:

What database account user name do you want to use to create database connections?

Database User Name:

What is the database account password to use to create database connections?

Password:

Confirm Password:

8. In this step, modify the URL as
`jdbc:mysql://ipaddress:3306/gatekeeper?useUnicode=yes&characterEncoding=UTF-8` i.e., add "`?useUnicode=yes&characterEncoding=UTF-8`" at the end of existing url. The remaining can be left as is and test the connection by clicking on **Test Configuration** option, which should show connection is fine. Once connection is tested and found to be fine. Click **Next**.

API Gateway Installation Guide

Create a New JDBC Data Source

Test Configuration | Back | Next | Finish | Cancel

Test Database Connection

Test the database availability and the connection properties you provided.

What is the full package name of JDBC driver class used to create database connections in the connection pool?

(Note that this driver class must be in the classpath of any server to which it is deployed.)

Driver Class Name: com.mysql.jdbc.Driver

What is the URL of the database to connect to? The format of the URL varies by JDBC driver.

URL: jdbc:mysql://10.75.217.83:3306/gatekeeper

What database account user name do you want to use to create database connections?

Database User Name: mysqluser

What is the database account password to use to create database connections?

(Note: for secure password management, enter the password in the Password field instead of the Properties field below)

Password: 

Confirm Password: 

What are the properties to pass to the JDBC driver when creating database connections?

Properties:
user=mysqluser

The set of driver properties whose values are derived at runtime from the named system property.

9. Check in front of WLNG_SINGLETIER_Cluster as shown in the screen below and click **Finish**.

Create a New JDBC Data Source

Back | Next | Finish | Cancel

Select Targets

You can select one or more targets to deploy your new JDBC data source. If you don't select a target, the data source will be created but not deployed. You will need to deploy the data source at a later time.

Servers

AdminServer

Clusters

WLNG_SINGLETIER_Cluster
 All servers in the cluster
 Part of the cluster
 AppServer1

Back | Next | Finish | Cancel

10. Similarly create datasource "wlng.datasource2" by repeating steps followed to create wlng.datasource1. The wlng.datasource2 needs to be provided with SQL node2 details. If more datasources are required, please repeat the steps followed to create wlng.datasource1 and provide corresponding SQL node details.

API Gateway Installation Guide

11. Delete the existing datasource "wlng.datasource" as we have to create multi datasource with the same name.

To delete datasource "wlng.datasource":

- Navigate to **Domain Structure** → **Services** → **Data Sources**
- Check the box against this datasource and click **Delete** in the section "Data Sources (Filtered - More Columns Exist)".
- Click **Yes** when prompted for re-confirmation.

12. Click **New** in the "Data Sources (Filtered - More Columns Exist)" section to create new multi datasource by selecting the option "**Mutli Data Source**". Provide **Name**, **JNDI Name** and **Algorithm Type**, as shown in the screen below and click **Next**:

Create a New JDBC Multi Data Source

Configure the Multi Data Source

The following properties will be used to identify your new JDBC multi data source.

* Indicates required fields

What would you like to name your new JDBC multi data source?

Name:

What scope do you want to create your JDBC Multi Data Source in ?

Scope:

What JNDI name would you like to assign to your new JDBC multi data source?

JNDI Name:

What algorithm type for this JDBC Multi Data Source would you like to select?

Algorithm Type:

Back **Next** **Finish** **Cancel**

13. Check against "WLNG_SINGLETIER_Cluster" as shown in screen below and click **Next**.

API Gateway Installation Guide

Create a New JDBC Multi Data Source

Back Next Finish Cancel

Select Targets

You can select one or more targets to deploy your new JDBC Multi Data Source.

Servers

AdminServer

Clusters

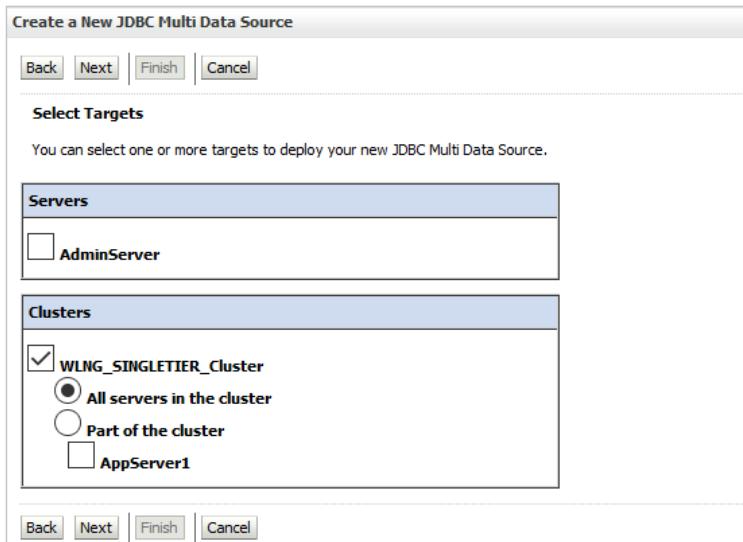
WLNG_SINGLETIER_Cluster

All servers in the cluster

Part of the cluster

AppServer1

Back Next Finish Cancel



14. Choose **Non-XA Driver** as shown in the screen below and click **Next**.

Create a New JDBC Multi Data Source

Back Next Finish Cancel

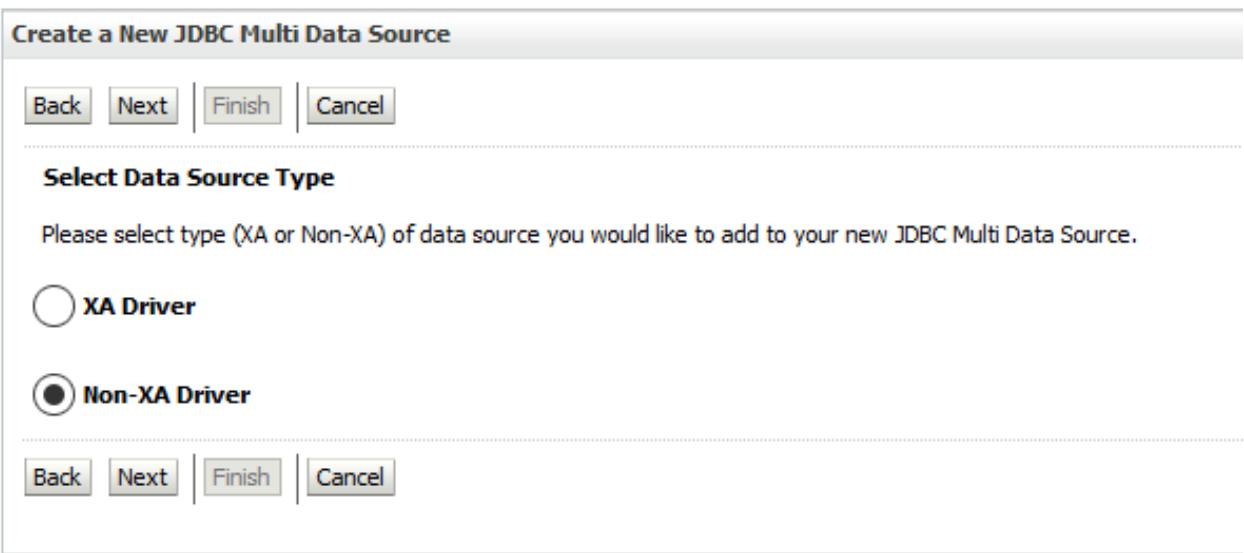
Select Data Source Type

Please select type (XA or Non-XA) of data source you would like to add to your new JDBC Multi Data Source.

XA Driver

Non-XA Driver

Back Next Finish Cancel



15. The `wlng.datasource1` and `wlng.datasource2` will be available under "**Available**" area, move them under "**Chosen**" area as shown in the screen below and click **Finish**.

Create a New JDBC Multi Data Source

Add Data Sources

What JDBC Data Sources would you like to add to your new JDBC Multi Data Source?

Data Sources:

Available: wlng.localTX.datasource

Chosen: wlng.datasource1
 wlng.datasource2

Create a New Data Source

Back **Next** **Finish** **Cancel**

Note: There will be wlng.datasource1, wlng.datasource2, and so on. If there are more datasources then they would also need to be moved under **Chosen** section.

16. Navigate to **DomainStructure** → **Environment** → **Clusters**.
 - Click on **WLNG_SINGLETIER_Cluster**
 - Navigate to **Migration** tab under **Configuration** tab.
 - Change "**Data Source For Automatic Migration:**" to **wlng.datasource** as shown in the screen below and click **Save**.

Settings for WLNG_SINGLETIER_Cluster

Configuration **Monitoring** **Control** **Deployments** **Services** **Notes**

General **JTA** **Messaging** **Servers** **Replication** **Migration** **Singleton Services** **Scheduling** **Overload** **Health Monitoring** **HTTP** **Coherence**

Save

If a clustered server fails, Node Manager can automatically restart the server and its services on another machine. This page allows you to specify the machines where Node Ma

Candidate Machines For Migratable Servers:

Available: Admin
 machine_AppServer1

Chosen:

Migration Basis: **Database**

Data Source For Automatic Migration: **wlng.datasource** **New**

Auto Migration Table Name: **WLS_ACTIVE**

Member Death Detector Enabled

17. Now navigate back to **Data Sources** page, click **New** and select "**Generic Data Source**". Provide **Name**, **JNDI Name** & **Database Type** as shown in the screen below and click **Next**.

API Gateway Installation Guide

Create a New JDBC Data Source

JDBC Data Source Properties

The following properties will be used to identify your new JDBC data source.
* Indicates required fields

What would you like to name your new JDBC data source?

Name:

What scope do you want to create your data source in ?

Scope:

What JNDI name would you like to assign to your new JDBC Data Source?

JNDI Name:

What database type would you like to select?

Database Type:

Back **Next** **Finish** **Cancel**

18. Select Database Driver as shown in the screen below:

Create a New JDBC Data Source

JDBC Data Source Properties

The following properties will be used to identify your new JDBC data source.

Database Type: MySQL

What database driver would you like to use to create database connections? Note: * indicates that the driver is explicitly supported by Oracle WebLogic Server.

Database Driver: MySQL's Driver (Type 4) Versions:using com.mysql.jdbc.Driver

Back **Next** **Finish** **Cancel**

19. Remove the check against the selection, as shown in the screen below and click **Next**.

API Gateway Installation Guide

Create a New JDBC Data Source

Back | Next | Finish | Cancel

Transaction Options

You have selected non-XA JDBC driver to create database connection in your new data source.

Does this data source support global transactions? If yes, please choose the transaction protocol for this data source.

Supports Global Transactions

Select this option if you want to enable non-XA JDBC connections from the data source to participate in global transactions using the *Logging Last Resource* (LLR) transaction optimization. Recommended in place of Emulate Two-Phase Commit.

Logging Last Resource

Select this option if you want to enable non-XA JDBC connections from the data source to emulate participation in global transactions using JTA. Select this option only if your application can tolerate heuristic conditions.

Emulate Two-Phase Commit

Select this option if you want to enable non-XA JDBC connections from the data source to participate in global transactions using the one-phase commit transaction processing. With this option, no other resources can participate in the global transaction.

One-Phase Commit

Back | Next | Finish | Cancel

Note: The checkbox against "Supports Global Transactions" is not checked.

20. Provide **Database Name** as "gatekeeper", **Host Name** as "Ip of SQL Node1", Port as "3306", **Database User Name** is the new user name created while configuring SQL on SQL node1 during MySQL setup creation. Provide the corresponding password and click **Next**.

Create a New JDBC Data Source

Back | Next | Finish | Cancel

Connection Properties

Define Connection Properties.

What is the name of the database you would like to connect to?

Database Name:

What is the name or IP address of the database server?

Host Name:

What is the port on the database server used to connect to the database?

Port:

What database account user name do you want to use to create database connections?

Database User Name:

What is the database account password to use to create database connections?

Password:

Confirm Password:

Back | Next | Finish | Cancel

21. In this step, modify URL to look as `jdbc:mysql://ipaddress:3306/gatekeeper?useUnicode=yes&characterEncoding=UTF-8` i.e., after correcting ipaddress of SQL node1, add `?useUnicode=yes&characterEncoding=UTF-8` at the end of url. The remaining can be left as is. Test the connection by clicking on **Test Configuration** that would show the connection is fine. Once connection is tested and found to be fine. Click **Next**.

API Gateway Installation Guide

Create a New JDBC Data Source

[Test Configuration](#) | [Back](#) | [Next](#) | [Finish](#) | [Cancel](#)

Test Database Connection

Test the database availability and the connection properties you provided.

What is the full package name of JDBC driver class used to create database connections in the connection pool?

(Note that this driver class must be in the classpath of any server to which it is deployed.)

Driver Class Name:

What is the URL of the database to connect to? The format of the URL varies by JDBC driver.

URL:

What database account user name do you want to use to create database connections?

Database User Name:

What is the database account password to use to create database connections?

(Note: for secure password management, enter the password in the Password field instead of the Properties field below)

Password:

Confirm Password:

What are the properties to pass to the JDBC driver when creating database connections?

Properties:

Please dont miss to update the url in the above step with
jdbc:mysql://ipaddress:3306/gatekeeper?useUnicode=yes&characterEncoding=UTF-8, otherwise cyrillic cannot be supported.

22. Check against "WLNG_SINGLETIER_Cluster" as shown in the screen below and click **Next**.

API Gateway Installation Guide

Create a New JDBC Data Source

Back Next Finish Cancel

Select Targets

You can select one or more targets to deploy your new JDBC data source. If you don't select a target, the data source will be

Servers

AdminServer

Clusters

WLNG_SINGLETIER_Cluster
 All servers in the cluster
 Part of the cluster
 AppServer1

Back Next Finish Cancel

23. Similarly create another data source named "wlng.localTX.datasource2" by repeating steps followed to create "wlng.localTX.datasource1". If more data sources are required, repeat the steps followed to create wlng.datasource1 and provide corresponding SQL node details. The wlng.localTX.datasource2 should be provided with SQL node 2 details.
24. Delete the existing datasource named "wlng.localTX.datasource" to create multi data source with the same name. To delete datasource "wlng.localTX.datasource", check the box against this datasource and click **Delete** in the section "**Data Sources (Filtered - More Columns Exist)**" on the data source. Click **Yes** when asked for re-confirmation.
25. On Data Source page, click **New** and select "**Multi Data Source**" to create data source named "wlng.localTX.datasource".

Name: wlng.localTX.datasource
JNDI Name: wlng.localTX.datasource

Algorithm Type: Failover

Check against "**WLNG_SINGLETIER_Cluster**" as shown in the screen below and click **Next**.

Create a New JDBC Multi Data Source

Back Next Finish Cancel

Select Targets

You can select one or more targets to deploy your new JDBC Multi Data Source.

Servers

AdminServer

Clusters

WLNG_SINGLETIER_Cluster
 All servers in the cluster
 Part of the cluster
 AppServer1

Back Next Finish Cancel

26. Choose Non-XA Driver as shown in the screen below and click **Next**.

API Gateway Installation Guide

Create a New JDBC Multi Data Source

Back Next | Finish | Cancel

Select Data Source Type

Please select type (XA or Non-XA) of data source you would like to add to your new JDBC Multi Data Source.

XA Driver

Non-XA Driver

Back Next | Finish | Cancel

27. The `wlng.localTX.datasource1` and `wlng.localTX.datasource2` will be available under "**Available**", and must be moved under "**Chosen**" as shown in the screen below, then click **Finish**.

Create a New JDBC Multi Data Source

Back Next | Finish | Cancel

Add Data Sources

What JDBC Data Sources would you like to add to your new JDBC Multi Data Source?

Data Sources:

Available:

- `wlng.datasource1`
- `wlng.datasource2`

Chosen:

- `wlng.localTX.datasource1`
- `wlng.localTX.datasource2`

Create a New Data Source

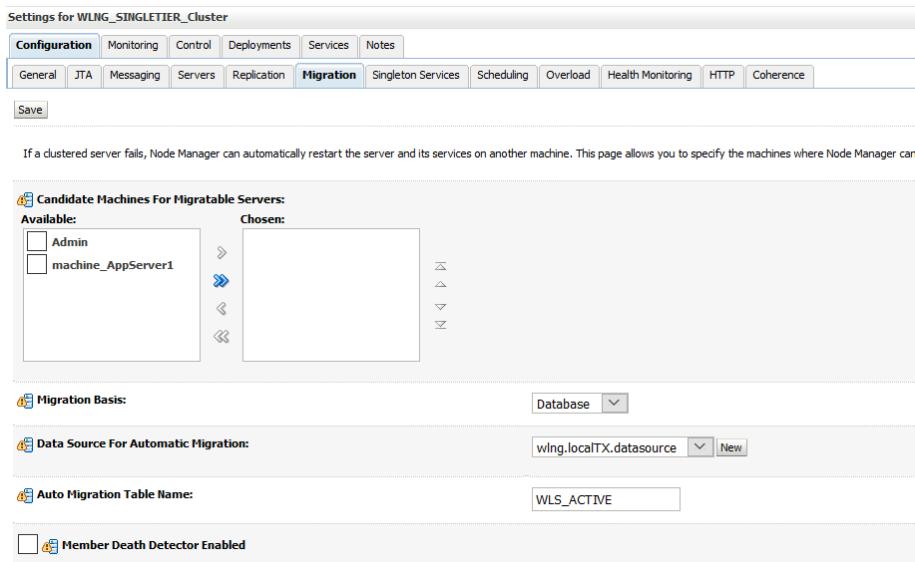
Back Next | Finish | Cancel

Note: There will be `wlng.localTX.datasource1`, `wlng.localTX.datasource1`, and so on. If there are more datasources then they also need to be moved under **Chosen** section.

28. Navigate to **DomainStructure** → **Environment** → **Clusters**

- Click `WLNG_SINGLETIER_Cluster`
- Navigate to **Migration** under **Configuration** tab.
- Change "**Data Source For Automatic Migration:**" to `wlng.localTX.datasource` as shown in the screen below and click **Save**.

API Gateway Installation Guide



Settings for WLNG_SINGLETIER_Cluster

Migration

Candidate Machines For Migratable Servers:

Available: Admin, machine_AppServer1

Chosen: none

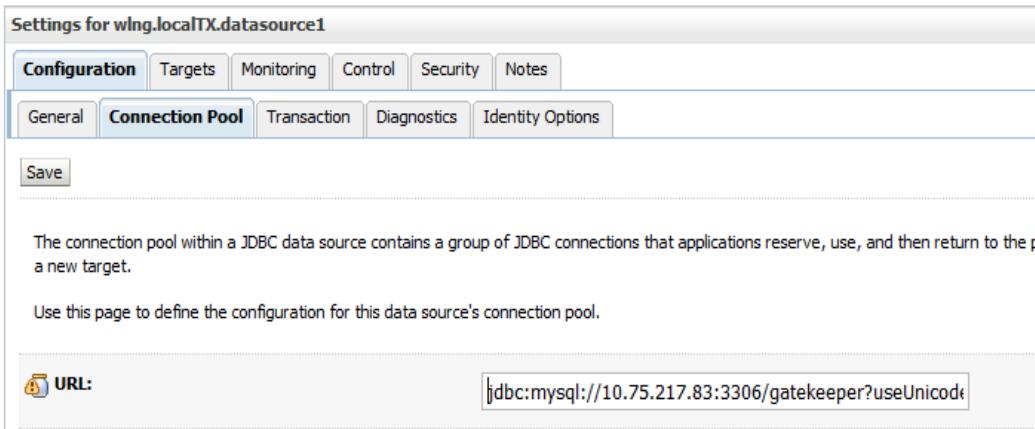
Migration Basis: Database

Data Source For Automatic Migration: wlng.localTX.datasource

Auto Migration Table Name: WLS_ACTIVE

Member Death Detector Enabled

29. Navigate to datasource page, make sure to verify that JDBC url is in the format "jdbc:mysql://ipaddress:3306/gatekeeper?useUnicode=yes&characterEncoding=UTF-8" in all datasources. This can be verified by navigating to datasource page and click on datasources (wlng.datasource1, wlng.datasource2, wlng.localTX.datasource1, wlng.localTX.datasource2, etc).
30. Navigate to **Connection Pool** under **Configuration** tab (for each datasource). Change the **Maximum capacity** to 40 for all wlng.datasourceX and for wlng.localTX.datasourceX it should be 75.
 - a. Change value of "**Statement Cache Size:**" from 10 to 200.
 - b. Click **Save**.
 - c. Click **Advanced** at the bottom of the page and make the following changes:
 - i. Check the checkbox against "**Test Connections On Reserve**"
 - ii. Change "**Seconds to Trust an Idle Pool Connection:**" to 10
 - iii. Change "**Test Frequency**" value from 120 to 5
 - iv. Change "**Connection Count of Refresh Failures Till Disable:**" to 1
 - v. Change "**Count of Test Failures Till Flush:**" to 1
 - vi. The changes suggested above must be repeated on all the available data sources.



Settings for wlng.localTX.datasource1

Connection Pool

URL: jdbc:mysql://10.75.217.83:3306/gatekeeper?useUnicode=yes&characterEncoding=UTF-8

31. After performing all the above steps, click on **Activate Changes** button on the left side of the **Change Center** section to commit the new changes.

Start all the Appservers and verify that OCSG is up and running on all Appservers without any issue.

Appendix A. Example Parameter file

A.1. Guidelines to create parameter 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"; Note: "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"

A.2. Parameter file for DSR APIGW Database

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 >_Params.yaml

For example:

- dsrCloudInit_Site00_NetworkOam_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: 192.168.321.0/24
ntpServer: 10.250.32.10
noamSG: Site00_NOAM_SG

```

Network OAM params file (Fixed IP)

parameters:

```
numPrimaryNoams: 1
numNoams: 1
noamlImage: DSR-8.4.0.0.0_84.x.0.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: 192.168.321.0/24
ntpServer: 10.75.185.194
noamSG: Site00_NOAM_SG
```

A.3. Parameter file for DSR APIGW Admin/Application

Following are the HEAT template files:

- dsrapigw.yml
- dsrapigw_env.yml

Following is the list of parameters used to configure DSR APIGW Admin/Application stack.

Table 4: Example Parameter file

Parameter category	Parameter Name	Type	Description
Common parameters	key_name	String	Name of key-pair to be used for compute instance
	image_id	String	Oracle Linux image to be used for compute instance
Number of VMs	num_app	Number	Number of AT servers to be configured as per the requirement
VM flavors	flavor_admin	String	Admin server VM profile
	flavor_app	String	AT server VM profile
IP Network	networks_admin	Json	List of networks (one or more) on admin server
	networks_app	Json	List of networks (one or more) on application server
hostname	hostname_admin	String	Hostname of the admin server
	user_name	String	User name of the admin server
	password	String	Password for the admin server

Appendix B. OCSG Properties file

Following table lists the user data to be filled in OCSG properties file.

Table 2: OCSG Properties file

Section	Parameter Name	Description
Admin	servers	<p>Add Admin server name and IP. For example:</p> <pre>servers = ["AdminServer:xxx.xxx.xxx.xxx"]</pre> <p>Note: It is recommend to follow the name of Admin server as 'AdminServer'</p> <p>Example: # servers = ["AdminServer:11.11.11.11"]</p> <p>IMI Interface address</p> <pre>servers = ["AdminServer: xxx.xxx.xxx.xxx"]</pre> <p>XMI Interface address</p> <pre>xmiInterfaces = ["AdminServer: xxx.xxx.xxx.xxx"]</pre>
	backupServers	<p>This is the DSRAPIGW DB server address where data is backed up. DR procedure will use this data.</p> <pre># Provide the Ipaddress of SQL node1.</pre> <pre># Admin server should have access to this server using the key/pem file.</pre> <pre>backupServer = xxx.xxx.xxx.xxx</pre> <p># This is the location in the DSRAPIGW DB server where the data should be backed up.</p> <p># Change this property to have below mentioned folder location</p> <pre>backupDomain = /var/lib/mysql-cluster</pre>
App	servers	<p>Add App server name and IP. Add comma seperated entries for multiple servers. For example,</p> <pre>servers = ["AppServer1:xxx.xxx.xxx.xxx", "AppServer2:xxx.xxx.xxx.xxx"]</pre> <p>Note: It is mandatory to follow the name of App servers as 'AppServer1', 'AppServer2' etc.</p>
App	xmiInterfaces	<p>XMI Interface address for all AppServers in ["Ip1", "Ip2"] format.</p> <p>For example,</p> <pre>xmiInterfaces = ["AppServer1: xxx.xxx.xxx.xxx", "AppServer2: xxx.xxx.xxx.xxx"]</pre>

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Section	Parameter Name	Description
App	xsiInterfaces	<p>XSI Interface address for all AppServers in ["Ip1","Ip2"] format.</p> <p>For example,</p> <pre>xsiInterfaces = ["AppServer1: xxx.xxx.xxx.xxx", "AppServer2: xxx.xxx.xxx.xxx"]</pre> <p>To add multiple XSIs to each AppServer the format should be,</p> <pre>["AppServer1:XSI1-IP", "AppServer2:XSI2", "AppServer2:XSI1-IP", "AppServer2:XSI2"]</pre>
App	externalLoadbalancerIP	<p>IP used to publish T8 APIs. This IP will be used when displaying T8 API access URLs in Partner and API management Portal.</p> <pre>externalLoadbalancerIP = xxx.xxx.xxx.xxx</pre>
Servers	cleanUpBeforeInstall	If the script failed to execute while running, the server will be in a bad shape for a fresh install. Keeping cleanUpBeforeInstall as "yes" will clean up the server and make it ready for script re-run.
Servers	ntp	<p>Provide NTP server IP</p> <pre>ntp = xxx.xxx.xxx.xxx</pre>
Servers	mtu	<p>Maximum transmission unit. The script copies multiple files from Admin server to App server.</p> <p>Before copying the MTU has to be set. Recommended value is "9000".</p> <pre>mtu = 9000</pre>
Servers	apiroot	<p>This variable is part of the API creation. <apiroot> is prefixed to the context uri of the APIs exposed.</p> <p># For example, the API name of Device triggering is "apiroot-dt"</p>
Servers	dsrMpList	Provide DSR MP XSI Ip list in format, MP1-XSI-IP:port,MP2-XSI1-IP:port.....
Files	pemfile	<p>Provide the .pem file location.</p> <pre>pemfile = /u02/software/ocsg-db-key.pem</pre>
Files	logfile	<p>Custom log file for Installation. Change log file name if required.</p> <pre>logfile = ocsg_install.log</pre>

Section	Parameter Name	Description
Files	presentFolder	The scripts will be present in this location. This property should not be changed presentFolder = /u02
Files	targetFolder	The scripts will be copied to this location. This property should not be changed targetFolder = /u03
Files	targetPath	Provide the location of the scripts. This property should not be changed targetPath = /app/oracle/
Files	scripts	Provide the folder name where scripts need to be stored. This property should not be changed. scripts = scripts
Files	extendWizard	Custom scripts will be present here. This property should not be changed. extendWizard = extend_wizard/
Files	SCEFPackage_EAR	Default EAR file name. This property should not be changed. SCEFPackage_EAR = SCEFHandlers.ear
Files	nodemgr	Node manager service file name. This property should not be changed nodemgr = nodemgr
Files	DefaultJar	Location of ocsq_generic_jar. This property should not be changed defaultJar = /usr/TKLC/dsapigw/ocsq_generic_jar
Files	volumeName	Provide the Volume name, This property should not be changed volumeName = ocsq
Files	volumeSize	Volume size in GB. Script will create a new volume of this size. This field should not be changed volumeSize = 10
Files	inventoryLoc	Inventory log location of OCSG. This property should not be changed inventoryLoc = /u02/inventory
Files	cdr_targetFolder	Target folder cdrs cdr_targetFolder = /u04
Files	cdr_volumeSize	cdr Volume size in GB. Script will create a new volume of this size cdr_volumeSize = 5
Files	cdr_volumeName	Provide the Volume name

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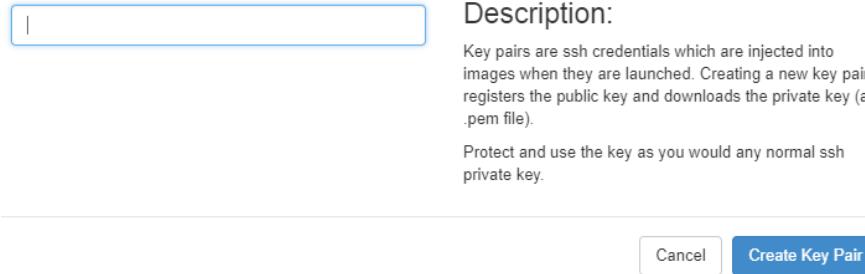
Section	Parameter Name	Description
		cdr_volumeName = cdrv
Files	customslaxsd	CustomSLA XSD Definition file name customslaxsd = customslaxsd.xsd
Credentials	mysqlJdbcServerUrl	MySQL DB credentials. Provide IP address of the DSR API GW database setup SQL Node1. jdbc:mysql://<db-server-ip>:3306/gatekeeper For Example, mysqlJdbcServerUrl = jdbc:mysql://30.30.30.17:3306/gatekeeper
Credentials	mysqlUserName	mysqlUserName = ocsq_auto Note: MySQL credentials to be updated in dsrapigw_default_params.rsp file available in the location /u02/app/oracle/scripts on all VM's of Admin & Appservers. Refer point# 3 of section 7. Configure DSR APIGW Admin/Application Server" in this document for more details.
Credentials	weblogicUser	Provide the DSR API GW Admin portal credentials.
Credentials	weblogicPassword	weblogicUser = weblogic weblogicPassword = tekelec123
Credentials	nodeManagerUser	Provide the Nodemanager credentials which will be used in all Admin and AppServers
Credentials	nodeManagerPassword	nodeManagerUser = nodemanager nodeManagerPassword = tekelec123
Credentials	operatorUser	A new operator will be created with this details to access partner relationship management portal.
Credentials	operatorPassword	operatorUser = oracleop3 operatorPassword = tekelec123
Credentials	adminServerUser	Below is the ssh user name in Admin and AppServers
Credentials	appServerUser	adminServerUser = admusr appServerUser = admusr
Ports	adminListenPort appListenPort appListenPortSSL	These are the default ports opened on IMI network should not be changed, these ports are used only for internal communication adminListenPort = 7001 appListenPort = 8001 appListenPortSSL = 8002
Ports	adminIMIPorts adminXMIPorts	Ports to be enabled in IP Firewall on Admin server:

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Section	Parameter Name	Description
		adminIMIPorts = 7001,5556,7002,9876,8050,3075,9090,7 adminXMIPorts = 9002
Ports	appIMIPorts appXMIPorts appXSIPorts	Ports to be enabled in IP Firewall on AppServers: appIMIPorts = 8001,8002,9876,5556,8050,3075,9090,7 appXMIPorts = 9002 appXSIPorts = 10001,10002

Appendix C. Create PEM file for Openstack

Procedure 10. Create PEM File for openstack

STEP #	Procedure	Description
This procedure describes how to create PEM file for openstack.		
Prerequisite: All the respective infrastructures has to be up and running		
Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. Contact My ORACLE Support (MOS) and ask for assistance.		
1 □	Login to Openstack	Login to the Openstack.
2 □	Go to Create KeyPair option	<p>1. Navigate to Project -> Compute -> Access & Security -> Key Pairs 2. Click Create Key Pair button</p> <p>Access & Security</p> 
3 □	Create Key Pair	<p>Enter the required Key Pair Name and click Create Key Pair.</p> <p>Create Key Pair</p> <p>Key Pair Name *</p>  <p>Description:</p> <p>Key pairs are ssh credentials which are injected into images when they are launched. Creating a new key pair registers the public key and downloads the private key (a .pem file).</p> <p>Protect and use the key as you would any normal ssh private key.</p>

Appendix D. Create PEM file for VM

Procedure 11. Create PEM File for VM

STEP #	Procedure	Description
This procedure describes how to create PEM file for VM.		
Prerequisite: All the respective infrastructures has to be up and running		
Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. Contact My ORACLE Support (MOS) and ask for assistance.		
1 □	VMware client: Login to client	Open the VMware client
2 □	Admin Server: Create Keys	Execute <code>ssh-keygen</code> It will create public and private keys on the Admin server. Note: Do not provide any input.
3 □	Admin Server: Copy id_rsa	Copy the <code>id_rsa</code> to a pem file on Admin server: <code>cp /home/admusr/.ssh/id_rsa /u02/key.pem</code>
4 □	Admin Server: Install Keys	Install the keys on App Server by running command: <code>ssh-copy-id admusr@<IP of AppServer></code> Execute command on Admin server (repeat for all App servers).
5 □	Admin Server: Copy ssh keys	Check from Admin server if you are able to login to App Server without password by running command. <code>ssh -i /u02/key.pem admusr@<IP of AppServer></code> You need to copy the ssh keys to all App servers. Once done, edit the ocsg.properties file to point to correct pem file.

Appendix E. Resource Profile for DSR APIGW Database and Admin/Application

The following table provides a list of resources required for DSR APIGW Database, Admin and Application servers.

Table 5: Resource Profile for DSR APIGW

DSR APIGW	vCPU	RAM (GB)	Disk (GB)	Network Interfaces
Admin Server	4	6	70	2
Application Server	12	16	70	3*
Management Node (DB)	4	6	70	
Data Node (DB)	12	64	200	
SQL Node (DB)	8	16	70	

***Note:** Multiple XSI Network interfaces are supported for App servers. Maximum 16 network XSI interfaces are supported.

Appendix F. Convert vmdk to qcow2 format

STEP #	Procedure	Description
<p>This procedure describes how to convert vmdk to qcow2 format.</p> <p>Prerequisite: 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>Contact My ORACLE Support (MOS) ask for assistance.</p>		
<p>1</p> <p><input type="checkbox"/> Login to Qemu-img tool</p> <p>Login to the Qemu-img tool.</p>		
<p>2</p> <p><input type="checkbox"/> Convert the file format</p> <p>Convert vmdk to qcow2 format</p> <p>Use the qemu-img tool to create a qcow2 image file using this command:</p> <pre>qemu-img convert -f vmdk -O qcow2 <VMDK filename> <QCOW2 filename></pre> <p>Example:</p> <pre>qemu-img convert -f vmdk -O qcow2 DSR-82_12_0.vmdk DSR-82_12_0.qcow2</pre> <p>Note:- Install the qemu-img tool (if not already installed) using this yum command:</p> <pre>sudo yum install qemu-img</pre> <p>Import the converted qcow2 image using the “glance” 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>		

Appendix G. 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>
```

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

Appendix H. 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, there are multiple layers of menus selections. Make the selections in the sequence shown below on the Support telephone menu:

- 1) For the first set of menu options, select 2, "New Service Request". You will hear another set of menu options.
- 2) In this set of menu options, select 3, "Hardware, Networking and Solaris Operating System Support". A third set of menu options begins.
- 3) In the third set of options, select 2, "Non-technical issue". Then you will be connected to a live agent who can assist you with MOS registration and provide Support. Identifiers. Simply mention you are a Tekelec Customer new to MOS.