

**Oracle® Communications
Diameter Signaling Router**

SDS 8.4 Cloud Disaster Recovery User's Guide

Release 8.4

F12359-02

January 2021

ORACLE®

Oracle Communications Diameter Signaling Router SDS Cloud Disaster Recovery Guide, Release 8.4

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See more information on My Oracle Support (MOS) in 0.

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1. Introduction

This document describes procedures to use during SDS Cloud product related disaster scenarios. The disaster scenarios covered in this document are as follows:

1. A defective DP server
2. A defective Query server
3. A defective DP SOAM server
4. A defective SDS NOAM server
5. A defective SDS NOAM server pair
6. A defective DP SOAM server pair OR DP SOAM deployed in "Active only" redundancy
7. A defective SDS NOAM server pair and Query server with DR NOAM server and DR QS available
8. A defective DR SDS NOAM server pair and Query server

The audience for this document includes GPS groups such as Software Engineering, Product Verification, Documentation, and Customer Service including Software Operations and First Office Application. This document can also be executed by Oracle customers as long as Oracle Customer Service personnel are involved and/or consulted. It can also be used at Oracle by PV and development teams.

Note: Please note that failures can happen from the host or Infrastructure level too. Different infrastructures have different approaches to recover VMs, which is not covered in this document. For example, VMWare has a vMotion feature that can migrate VM from one host to another. Any such Infrastructure/Hypervisor related migrations/disaster recovery scenarios are out of scope of this document. This document covers the DR scenarios within the SDS application.

1.1 References

- [1] DSR Disaster Recovery Guide
- [2] SDS Cloud Installation and Configuration Guide
- [3] Productizing Cloud Deployable DSR
- [4] DSR/SDS 8.x NOAM Failover User's Guide

1.2 Acronyms

Table 1. Acronyms

Acronym	Meaning
DP	Database Processor
NOAM	Network Operations, Administration, and Maintenance
OAM	Operations, Administration, and Maintenance
OVM-M	Oracle Virtual Machine Manager
OVM-S	Oracle Virtual Machine Server
SDS	Subscriber Database System
SOAM	Systems Operations, Administration, and Maintenance
VIP	Virtual IP
VM	Virtual Machine running specific server logic, for example, DP VM would mean Virtual Machine running database processor server logic

1.3 Assumptions

This procedure assumes the following:

- The user conceptually understands SDS topology and network configuration.
- The user has at least an intermediate skill set with command prompt activities on an open systems computing environment such as Linux or TPD.

1.4 How to Use this Document

When executing this document, understand the following to ensure you understand the manual's intent:

- Before beginning a procedure, completely read the instructional text (it appears immediately after the Section heading for each procedure) and all associated procedural WARNINGS or NOTES.
- Before execution of a STEP within a procedure, completely read the left and right columns including any STEP specific WARNINGS or NOTES.
- If a procedural STEP fails to execute successfully, STOP and contact My Oracle Support (MOS) (as described in 0).

2. Disaster Recovery Scenarios



!!Warning!!

If you need to restore the database backup for NOAM servers and the backup directory is not in the system because it is DRed, refer to 0 for the procedure on how to check for a backup directory and create it, if needed.

2.1 Replace A DP Server

2.1.1 Pre-Condition

- DP VM has stopped processing traffic.
- It has been determined the DP VM is defective/corrupted and needs to be replaced.

2.1.2 Recovery Steps

Procedure 1. Replace a DP Server

STEP #	Procedure	Description
1. <input type="checkbox"/>	Prepare for VM replacement	Identify the DP server that needs to be replaced. DP server hostname = _____

STEP #	Procedure	Description
2. <input type="checkbox"/>	Make DP server's Max Allowed HA Role "OOS" so it does not become active	<ol style="list-style-type: none">1. From the SDS GUI, navigate to Status & Manage > HA.2. Select the DP server that needs to be replaced.3. Change its Max Allowed HA Role to OOS.4. Click OK.
3. <input type="checkbox"/>	Remove DP server from the server group	<ol style="list-style-type: none">1. From the SDS GUI, navigate to Configuration > Server Groups.2. Select DP server's server group.3. Click Edit.4. Move DP server out of the server group.5. Click OK.

STEP #	Procedure	Description
4. <input type="checkbox"/>	Replace VM	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective DP server VM. 2. Power down DP server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log in to the OpenStack control node. <div data-bbox="523 580 806 608" style="border: 1px solid black; padding: 2px;"><pre>\$ ssh admusr@node</pre></div> <ol style="list-style-type: none"> 2. Power down defective DP server VM and remove it from the inventory/disk: <div data-bbox="523 692 904 720" style="border: 1px solid black; padding: 2px;"><pre>\$ nova delete <VM Name></pre></div> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log in to the command line interface of the OVM-M. <div data-bbox="523 914 1129 941" style="border: 1px solid black; padding: 2px;"><pre>OVM> ssh -l admin <OVM-M IP> -p 10000</pre></div> <p>Example:</p> <div data-bbox="577 1020 1367 1110" style="border: 1px solid black; padding: 2px;"> <pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</pre> </div> <ol style="list-style-type: none"> 2. Power down SDS VM(s). <div data-bbox="523 1195 967 1222" style="border: 1px solid black; padding: 2px;"><pre>OVM> stop Vm name=<VM Name></pre></div> <p>Note: Wait for the VM to have the state Stopped.</p> <ol style="list-style-type: none"> 3. Remove the VM from the inventory/disk. <div data-bbox="523 1353 997 1381" style="border: 1px solid black; padding: 2px;"><pre>OVM> delete Vm name=<VM Name></pre></div> <p>Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p>Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
5. <input type="checkbox"/>	Prepare the new DP server	Execute Procedure 11.1 Applying the Database Processor Configuration File (DP) from [2] SDS Cloud Installation and Configuration Guide.
6. <input type="checkbox"/>	Add DP server to the server group and validate pairing	<p>From [2] SDS Cloud Installation and Configuration Guide, execute these procedures in sequence on the new DP server:</p> <ol style="list-style-type: none"> 1. Procedure 11.3 Adding the Database Processor into the DP Server Group (DP). 2. Procedure 11.4 Restarting the Database Processor Application (DP).

2.1.3 Post-Condition

DP server is processing traffic.

2.2 Replace a DP SOAM Server

2.2.1 Pre-Condition

- DP SOAM VM has stopped functioning.
- It has been determined the DP SOAM VM needs to be replaced.
- SDS GUI is accessible.

Note: If VIP is required, update the port so that two addresses can be used. See **Appendix E Application VIP Failover Options** from [2] SDS Cloud Installation and Configuration Guide.

2.2.2 Recovery Steps

Procedure 2. Replace a DP SOAM Server

STEP #	Procedure	Description
1. <input type="checkbox"/>	Prepare for VM replacement	Identify the DP SOAM server that needs to be replaced. DP SOAM server hostname = _____
2. <input type="checkbox"/>	Make DP SOAM server's Max Allowed HA Role "OOS" so it does not become active	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Status & Manage > HA. 2. Select the DP SOAM server that needs to be replaced. 3. Change its Max Allowed HA Role to OOS. 4. Click OK.
3. <input type="checkbox"/>	Remove DP SOAM from the server group	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Configuration > Server Groups. 2. Select DP SOAM server's server group. 3. Click Edit. 4. Move DP SOAM server out of the server group. 5. Click OK.

STEP #	Procedure	Description
<input type="checkbox"/> 4.	Replace VM	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective DP SOAM server VM. 2. Power down DP SOAM server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log into the OpenStack control node. <div data-bbox="523 587 804 614" style="border: 1px solid black; padding: 2px;"> <code>\$ ssh admusr@node</code> </div> <ol style="list-style-type: none"> 2. Power down defective DP SOAM server VM and remove it from the inventory/disk: <div data-bbox="523 724 902 751" style="border: 1px solid black; padding: 2px;"> <code>\$ nova delete <VM Name></code> </div> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log into the command line interface of the OVM-M. <div data-bbox="523 950 1127 977" style="border: 1px solid black; padding: 2px;"> <code>OVM> ssh -l admin <OVM-M IP> -p 10000</code> </div> <p>Example:</p> <div data-bbox="576 1043 1364 1142" style="border: 1px solid black; padding: 2px;"> <code>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</code> </div> <ol style="list-style-type: none"> 2. Power down SDS VM(s). <div data-bbox="523 1227 964 1254" style="border: 1px solid black; padding: 2px;"> <code>OVM> stop Vm name=<VM Name></code> </div> <p>Note: Wait for the VM to have the state Stopped.</p> <ol style="list-style-type: none"> 3. Remove the VM from the inventory/disk. <div data-bbox="523 1385 995 1412" style="border: 1px solid black; padding: 2px;"> <code>OVM> delete Vm name=<VM Name></code> </div> <p>Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p>Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
<input type="checkbox"/> 5.	Prepare the new DP SOAM server	Execute Procedure 9.3 Applying the SOAM Server Configuration File from [2] SDS Cloud Installation and Configuration Guide.
<input type="checkbox"/> 6.	Add DP SOAM server to the server group and validate pairing	From [2] SDS Cloud Installation and Configuration Guide, execute these procedures in sequence on the new DP SOAM server: <ol style="list-style-type: none"> 1. Procedure 10.2 Adding a Server to the OAM Server Group (SOAM). 2. Procedure 10.3 Restarting OAM Server Application (SOAM).

2.2.3 Post-Condition

DP SOAM is back in service.

2.3 Replace a Query Server

2.3.1 Pre-Condition

- Query server VM has stopped functioning.
- It has been determined to replace the Query server VM.

Note: If VIP is required, perform the steps to update the port so that two addresses can be used (See Appendix E Application VIP Failover Options) from reference [2] SDS Cloud Installation and Configuration Guide.

2.3.2 Recovery Steps

Procedure 3. Replace a Query Server

STEP #	Procedure	Description
1. <input type="checkbox"/>	Prepare for server replacement	Identify the Query server that needs to be replaced. Query server hostname = _____
2. <input type="checkbox"/>	Make Query server's Max Allowed HA Role "OOS" so it does not become active	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Status & Manage > HA. 2. Select the Query server that needs to be replaced. 3. Change its Max Allowed HA Role to OOS. 4. Click OK.
3. <input type="checkbox"/>	Remove Query server from the server group	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Configuration > Server Groups. 2. Select Query server's server group. 3. Click Edit. 4. Move Query server out of the server group. 5. Click OK.

STEP #	Procedure	Description
4. <input type="checkbox"/>	Replace VM	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective Query server VM. 2. Power down Query server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log into the OpenStack control node. <pre>\$ ssh admusr@node</pre> <ol style="list-style-type: none"> 2. Power down defective Query server VM and remove it from the inventory/disk: <pre>\$ nova delete <VM Name></pre> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log into the command line interface of the OVM-M. <pre>OVM> ssh -l admin <OVM-M IP> -p 10000</pre> <p>Example:</p> <pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</pre> <ol style="list-style-type: none"> 2. Power down SDS VM(s). <pre>OVM> stop Vm name=<VM Name></pre> <p>Note: Wait for the VM to have the state Stopped.</p> <ol style="list-style-type: none"> 3. Remove the VM from the inventory/disk. <pre>OVM> delete Vm name=<VM Name></pre> <p>Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p>Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
5. <input type="checkbox"/>	Prepare the new Query server	Execute Procedure 6.2 Applying the Query Server Configuration File from [2] SDS Cloud Installation and Configuration Guide.
6. <input type="checkbox"/>	Add Query server to the server group and validate pairing	From [2] SDS Cloud Installation and Configuration Guide, execute Procedure 6.3 Adding the Query Server to the SDS Server Group on the new Query server.

STEP #	Procedure	Description
7. <input type="checkbox"/>	Make Query server's Max Allowed HA Role to "Active"	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Status & Manage > HA. 2. Select the Query server. 3. Change its Max Allowed HA Role to Observer. 4. Click OK.
8. <input type="checkbox"/>	Restart the Query server	From [2] SDS Cloud Installation and Configuration Guide, execute Procedure 6.4 Restarting the Query server Application on the new Query server.

2.3.3 Post-Condition

Query server is back in service.

2.4 Replace a SDS NOAM Server

2.4.1 Pre-Condition

- SDS NOAM server has stopped functioning.
- It has been determined to replace the SDS NOAM server.
- One SDS NOAM server is functioning.

Note: If VIP is required, perform the steps to update the port so that two addresses can be used (See Appendix E Application VIP Failover Options) from reference [2] SDS Cloud Installation and Configuration Guide.

2.4.2 Recovery Steps

Procedure 4. Replace a SDS NOAM Server

STEP #	Procedure	Description
1. <input type="checkbox"/>	Prepare for server replacement	Identify the SDS NOAM server that needs to be replaced. Hostname = _____
2. <input type="checkbox"/>	Make SDS NOAM server's Max Allowed HA Role "OOS" so it does not become active	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Status & Manage > HA. 2. Select the SDS NOAM server that needs to be replaced. 3. Change its Max Allowed HA Role to OOS. 4. Click OK.
3. <input type="checkbox"/>	Remove SDS from the server group	<ol style="list-style-type: none"> 1. From the SDS GUI, navigate to Configuration > Server Groups. 2. Select primary SDS's server group. 3. Click Edit. 4. Move SDS NOAM server out of the server group. 5. Click OK.

STEP #	Procedure	Description
4. <input type="checkbox"/>	Replace VM	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective SDS NOAM server VM. 2. Power down SDS NOAM server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log into the OpenStack control node. <div data-bbox="523 580 806 608" style="border: 1px solid black; padding: 2px;"><pre>\$ ssh admusr@node</pre></div> <ol style="list-style-type: none"> 2. Power down defective SDS NOAM server VM and remove it from the inventory/disk: <div data-bbox="523 720 904 747" style="border: 1px solid black; padding: 2px;"><pre>\$ nova delete <VM Name></pre></div> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log into the command line interface of the OVM-M. <div data-bbox="523 946 1127 973" style="border: 1px solid black; padding: 2px;"><pre>OVM> ssh -l admin <OVM-M IP> -p 10000</pre></div> <p>Example:</p> <div data-bbox="574 1041 1365 1142" style="border: 1px solid black; padding: 2px;"><pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</pre></div> <ol style="list-style-type: none"> 2. Power down SDS VM(s). <div data-bbox="523 1222 966 1250" style="border: 1px solid black; padding: 2px;"><pre>OVM> stop Vm name=<VM Name></pre></div> <p>Note: Wait for the VM to have the state Stopped.</p> <ol style="list-style-type: none"> 3. Remove the VM from the inventory/disk. <div data-bbox="523 1381 997 1408" style="border: 1px solid black; padding: 2px;"><pre>OVM> delete Vm name=<VM Name></pre></div> <p>Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p>Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
5. <input type="checkbox"/>	Prepare the new SDS NOAM server	Execute Procedure 4.4 Applying the SDS NOAM Server Configuration File from [2] SDS Cloud Installation and Configuration Guide.
6. <input type="checkbox"/>	Add SDS NOAM server to the server group and validate pairing	From [2] SDS Cloud Installation and Configuration Guide, execute these procedures in sequence on the new SDS NOAM server VM: <ol style="list-style-type: none"> 1. Procedure 5.2 Adding a Server to an OAM Server Group. 2. Procedure 5.3 Verifying the SDS NOAM Server Alarm Status.

2.4.3 Post-Condition

SDS NOAM server is back in service.

2.5 Replace a SDS NOAM Server Pair

2.5.1 Pre-Condition

- Active and standby SDS NOAM servers have stopped functioning.
- It has been determined to replace both VM(s) that host SDS NOAM servers.
- Recent backup archives of SDS configuration and provisioning databases are available.
- DR SDS NOAM servers are NOT available or are NOT installed.

2.5.2 Recovery Steps

Procedure 5. Replace a SDS NOAM Server Pair

STEP #	Procedure	Description
1. <input type="checkbox"/>	Determine SDS backup archive	Make sure you have access to the SDS backup archive containing provisioning data and configuration data. This backup archive should be in uncompressed format.
2. <input type="checkbox"/>	Replace old SDS VMs with new SDS VMs	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective SDS NOAM server VM. 2. Power down SDS NOAM server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log into the OpenStack control node. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>\$ ssh admusr@node</pre> </div> <ol style="list-style-type: none"> 2. Power down defective SDS NOAM server VM and remove it from the inventory/disk: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>\$ nova delete <VM Name></pre> </div> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log into the command line interface of the OVM-M. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>OVM> ssh -l admin <OVM-M IP> -p 10000</pre> </div> <p>Example:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</pre> </div> <ol style="list-style-type: none"> 2. Power down SDS VM(s).

STEP #	Procedure	Description
		<pre data-bbox="523 255 964 285">OVM> stop Vm name=<VM Name></pre> <p data-bbox="556 308 1171 340">Note: Wait for the VM to have the state Stopped.</p> <ol data-bbox="507 361 1041 390" style="list-style-type: none"> <li data-bbox="507 361 1041 390">3. Remove the VM from the inventory/disk. <pre data-bbox="523 413 992 443">OVM> delete Vm name=<VM Name></pre> <p data-bbox="507 466 1127 498">Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p data-bbox="507 508 1432 572">Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
<input data-bbox="192 604 225 646" type="checkbox"/> 3.	Configure the new SDS A server	Execute Procedure 4 Configuring SDS NOAM Servers A and B from [2] SDS Cloud Installation and Configuration Guide for only SDS A server.
<input data-bbox="192 730 225 772" type="checkbox"/> 4.	Copy SDS backup archive to new SDS A server	<ol data-bbox="507 699 1462 952" style="list-style-type: none"> <li data-bbox="507 699 1462 728">1. Login using ssh to the console of the new SDS NOAM server. <li data-bbox="507 741 1462 804">2. Copy the uncompressed backup archive identified in step 1 to /var/TKLC/db/filemgmt area on the newly installed first SDS NOAM server. <li data-bbox="507 817 1462 901">3. Execute <code>sudo prod.stop --ignore-cap</code> to stop running applications. Leave database running. <li data-bbox="507 914 1462 944">4. Restore the configuration DB by executing: <pre data-bbox="523 973 1380 1024">sudo idb.restore -n -t /var/TKLC/db/filemgmt -v <full path to configuration archive file></pre> <ol data-bbox="507 1058 1062 1087" style="list-style-type: none"> <li data-bbox="507 1058 1062 1087">5. Restore the provisioning DB by executing: <pre data-bbox="523 1110 1380 1161">sudo idb.restore -n -t /var/TKLC/db/filemgmt -v <full path to provisioning archive file></pre> <p data-bbox="507 1184 1408 1248">Note: This step may take up time depending upon the size of provisioning database.</p> <p data-bbox="556 1269 931 1298">SDS database is now restored.</p> <ol data-bbox="507 1311 1171 1341" style="list-style-type: none"> <li data-bbox="507 1311 1171 1341">6. Start application by executing <code>sudo prod.start</code>.
<input data-bbox="192 1406 225 1448" type="checkbox"/> 5.	Re-exchange SSH keys for remote import/export/ data servers	<ol data-bbox="507 1374 1462 1649" style="list-style-type: none"> <li data-bbox="507 1374 1462 1404">1. Log into the primary SDS GUI as admin user using VIP address. <li data-bbox="507 1417 1462 1480">2. Perform ssh key exchange for Remote Export using the SDS > Configuration > Options screen. <li data-bbox="507 1493 1462 1556">3. Perform ssh key exchange for Remote Import using SDS > Configuration > Options screen. <li data-bbox="507 1569 1462 1632">4. Perform ssh key exchange for Data Export using Administration > Remote Servers > Data Export screen.
<input data-bbox="192 1702 225 1744" type="checkbox"/> 6.	Install the new second SDS NOAM server	Follow recovery steps from section 2.4 of this document to restore the second SDS NOAM server.

2.5.3 Post-Condition

- Both SDS NOAM servers are back in service.

- Provisioning clients are connected to SDS VIP address.
- Provisioning continues.

2.6 Replace a DP SOAM Server Pair

2.6.1 Pre-Condition

- Active and Standby DP SOAM servers have stopped functioning.
- It has been determined to replace both VM(s) that host DP SOAM.
- Access to primary SDS GUI is available.
- DPs are not receiving provisioning database updates.

2.6.2 Recovery Steps

Procedure 6. Replace a DP Server Pair

STEP #	Procedure	Description
1. <input type="checkbox"/>	Prepare for server replacement	<p>Identify the DP SOAM server VM(s) that needs to be replaced.</p> <p>DP SOAM 1 = _____</p> <p>DP SOAM 2 = _____</p>
2. <input type="checkbox"/>	Replace old SDS DP SOAM VMs with new SDS SOAM VMs	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective DP SOAM server VM. 2. Power down DP SOAM server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide for each DP SOAM server VM to be replaced. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log into the OpenStack control node. <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <pre>\$ ssh admusr@node</pre> </div> <ol style="list-style-type: none"> 2. Power down defective DP SOAM server VM(s) and remove it from the inventory/disk: <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <pre>\$ nova delete <VM Name></pre> </div> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log into the command line interface of the OVM-M. <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <pre>OVM> ssh -l admin <OVM-M IP> -p 10000</pre> </div> <p>Example:</p> <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</pre> </div>

STEP #	Procedure	Description
		<p>2. Power down SDS VM(s).</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>OVM> stop Vm name=<VM Name></pre> </div> <p>Note: Wait for the VM to have the state Stopped.</p> <p>3. Remove the VM from the inventory/disk.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>OVM> delete Vm name=<VM Name></pre> </div> <p>Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p>Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
3. <input type="checkbox"/>	Prepare the new SDS SOAM servers	Execute Procedure 9.3 Applying the SOAM Server Configuration File from [2] SDS Cloud Installation and Configuration Guide.
4. <input type="checkbox"/>	Restart the SOAM servers	From [2] SDS Cloud Installation and Configuration Guide, execute Procedure 10.3 Restarting OAM Server Application (SOAM) for each DP SOAM server VM to be replaced.
5. <input type="checkbox"/>	Verify DP SOAM servers received SDS provisioning	<ol style="list-style-type: none"> 1. Log into the active DP SOAM GUI using the VIP address. 2. Navigate to Status & Manage > Servers. 3. Make sure the new DP SOAM server(s) show Norm for DB, Reporting Status, and Appl State.

2.6.3 Post-Condition

- Both DP SOAM servers are back in service.
- DP SOAM configuration changes can be made from DP SOAM GUI.
- DPs are now receiving provisioning updates.

2.7 Replace a SDS NOAM Server Pair and Query Server with DR NOAM Servers and DR Query Server Available

2.7.1 Pre-Condition

- Active and Standby SDS NOAM server have stopped functioning. User cannot access primary SDS site GUI.
- Query server has stopped functioning.
- It has been determined to replace both NOAM servers and the Query server.
- DR NOAM servers and DR Query server is available. User can access DR SDS GUI.

2.7.2 Recovery Steps

Procedure 7. Replace a SDS NOAM Server Pair and Query Server

STEP #	Procedure	Description
1. <input type="checkbox"/>	Bring DR SDS NOAM servers to primary SDS NOAM servers.	Follow the [4] DSR/SDS 8.x NOAM Failover User's Guide to convert DR NOAM servers to primary NOAM servers. After this step, SDS GUI is accessible and provisioning continues.
At this point, SDS provisioning is fully functioning. The remaining steps bring the former primary SDS NOAM server back into the service as the new-DR SDS NOAM servers.		
2. <input type="checkbox"/>	Bring former-primary SDS back to service	Execute section 2.5 to return the former primary SDS NOAM servers and site back to service. After this step, both the former primary SDS servers are back into service.
3. <input type="checkbox"/>	If you need to make the recovered site primary once again (optional)	Follow the reference [4] DSR/SDS 8.x NOAM Failover User's Guide.

2.7.3 Post-Condition

- GUI on the new primary SDS is accessible.
- Provisioning continues.
- Provisioning clients are connected to the new primary SDS.
- Database provisioning resumes.
- A new DR SDS GUI is accessible.
- Replication and collection alarms have cleared.

2.8 Replace a DR SDS NOAM Server Pair

2.8.1 Pre-Condition

- Active DR SDS-A, DR SDS-B, and DR SDS Query servers have stopped functioning.
- It has been determined to replace DR SDS NOAM and DR SDS Query servers.
- New DR SDS NOAM servers for replacement are available.
- Access to primary SDS GUI is functional.

2.8.2 Recovery Steps

Procedure 8. Replace a DR SDS NOAM Server Pair

STEP #	Procedure	Description
1. <input type="checkbox"/>	Prepare for server replacement	Identify the DR SDS NOAM servers that needs to be replaced. DR SDS-A server: _____ DR SDS-B server: _____ DR SDS Query server: _____

STEP #	Procedure	Description
<input type="checkbox"/> 2.	Replace old SDS VMs with new SDS VMs	<p>For VMWare based deployments:</p> <ol style="list-style-type: none"> 1. Open the Cloud client of your choice, for example, vSphere Client and locate the defective DP NOAM server VM. 2. Power down DP NOAM server VM and remove it from the inventory/disk. 3. Execute Procedure 1 Create SDS Guest from OVA (VMWare) from [2] SDS Cloud Installation and Configuration Guide for each DP SOAM server VM to be replaced. <p>For KVM/OpenStack based deployments:</p> <ol style="list-style-type: none"> 1. Log into the OpenStack control node. <pre>\$ ssh admusr@node</pre> <ol style="list-style-type: none"> 2. Power down defective DP NOAM server VM(s) and remove it from the inventory/disk: <pre>\$ nova delete <VM Name></pre> <ol style="list-style-type: none"> 3. Execute Procedure 2 Create SDS Guest from OVA (KVM/OpenStack) from [2] SDS Cloud Installation and Configuration Guide. <p>For OVM-S/OVM-M based deployments:</p> <ol style="list-style-type: none"> 1. Log into the command line interface of the OVM-M. <pre>OVM> ssh -l admin <OVM-M IP> -p 10000</pre> <p>Example:</p> <pre>[root@manager01 ~]# ssh -l admin 10.240.16.138 -p 10000 admin@10.240.16.138's password:</pre> <ol style="list-style-type: none"> 2. Power down SDS VM(s). <pre>OVM> stop Vm name=<VM Name></pre> <p>Note: Wait for the VM to have the state Stopped.</p> <ol style="list-style-type: none"> 3. Remove the VM from the inventory/disk. <pre>OVM> delete Vm name=<VM Name></pre> <p>Note: Repeat steps 2 and 3 for all the failed VMs.</p> <p>Execute Procedure 3 (3.1 & 3.2) Create SDS Guest from OVA (OVM/OVM-Manager) from [2] SDS Cloud Installation and Configuration Guide.</p>
<input type="checkbox"/> 3.	Install the new DR SDS servers	Execute Procedure 7 Configuring DR SDS NOAM Servers from [2] SDS Cloud Installation and Configuration Guide.
<input type="checkbox"/> 4.	Configure the new DR SDS servers	Execute Procedure 8 OAM Pairing for DR SDS NOAM Site from [2] SDS Cloud Installation and Configuration Guide.

STEP #	Procedure	Description
5. <input type="checkbox"/>	Restart the application on all new DR SDS NOAM servers	<ol style="list-style-type: none"> Log into the primary SDS GUI as admin user using VIP address. Navigate to Status & Manage > Servers. Select the DR SDS-A server. Click Restart. Click OK to confirm. Repeat steps for DR SDS-B server and DR SDS Query server.
6. <input type="checkbox"/>	Re-exchange SSH keys for remote import/export/ data servers	<ol style="list-style-type: none"> Log into the primary SDS GUI as admin user using VIP address. Perform ssh key exchange for Remote Export using the SDS > Configuration > Options screen. Perform ssh key exchange for Remote Import using SDS > Configuration > Options screen. Perform ssh key exchange for Data Export using Administration > Remote Servers > Data Export screen.

2.8.3 Post-Condition

- All DR SDS servers are back in service

Backup Directory

Procedure 9. Backup Directory

STEP #	Procedure	Description
1. <input type="checkbox"/>	NOAM VIP Console: Determine if backup directory exists	<p>1. Execute this command on an active NOAM server console (accessed using the VIP) and compare the output.</p> <pre>\$ cd /var/TKLC/db/filemgmt/ \$ ls -ltr</pre> <p>2. Look for the backup directory in the output.</p> <p>3. Make sure the directory is already created with correct permission. The directory looks like this:</p> <pre>drwxrwx--- 2 awadmin awadm 4096 Dec 19 02:15 backup</pre> <ul style="list-style-type: none"> • If the directory is already there with correct permissions, then skip steps 2 and 3. • If directory does not have the correct permissions, then go to step 3.
2. <input type="checkbox"/>	NOAM VIP Console: Create backup directory	<p>1. Go to the backup directory location.</p> <pre>cd /var/TKLC/db/filemgmt/</pre> <p>2. Create backup directory.</p> <pre>\$ mkdir backup</pre> <p>3. Verify directory has been created.</p> <pre>\$ ls -ltr /var/TKLC/db/filemgmt/backup</pre> <p>Note: A No such file or directory error message should not display. The directory should show as empty with the total as 0 for content.</p>
3. <input type="checkbox"/>	NOAM VIP Console: Change permissions of backup directory	<p>1. Verify directory has been created.</p> <pre>\$ ls -ltr /var/TKLC/db/filemgmt/backup</pre> <p>Note: A No such file or directory error message should not display. The directory should show as empty with the total as 0 for content.</p> <p>2. Change permissions for the backup directory.</p> <pre>\$ chmod 770 /var/TKLC/db/filemgmt/backup</pre> <p>3. Change ownership of backup directory.</p> <pre>\$ sudo chown -R awadmin:awadm /var/TKLC/db/filemgmt/backup</pre> <p>Directory displays as follows:</p> <pre>drwxrwx--- 2 awadmin awadm 4096 Dec 22 02:15 backup</pre>

4. <input type="checkbox"/>	NOAM VIP Console: Copy the backup file to the backup directory	<ol style="list-style-type: none">1. Copy the backup file to the backup directory. <pre>\$ cp BACKUPFILE /var/TKLC/db/filemgmt/backup</pre>2. Change permissions of files in the backup directory. <pre>\$ chmod 666 Backup.*</pre>3. Change ownership of files in the backup directory. <pre>\$ sudo chown -R awadmin:awadm Backup.*</pre>
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My Oracle Support (MOS)

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

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

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

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

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

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

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

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

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