**Oracle® Communications
Diameter Signaling Router**

SDS Cloud Disaster Recovery Guide

Release 5.0.1 / 7.1.1/7.2/7.3

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ORACLE®

Oracle Communications Diameter Signaling Router SDS 5.0.1 / 7.1.1/7.2/7.3 Cloud Disaster Recovery Guide

CAUTION: Use only the Upgrade procedure included in the Upgrade Kit.
Before upgrading any system, please access My Oracle Support (MOS) (https://support.oracle.com) and review any Technical Service Bulletins (TSBs) that relate to this upgrade.

My Oracle Support (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.

See more information on MOS in the Appendix section.

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document describes procedures to use during SDS Cloud 5.0.1 / 7.1.1/7.2/7.3 product related disaster scenarios. The disaster scenarios covered in 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 OR SDS deployed in "Active only" redundancy.
6. A defective DP SOAM server pair OR DP SOAM deployed in "Active only" redundancy.

This document is intended for execution by Oracle's Tekelec Customer Service team on fielded SDS systems. It also could be used at Tekelec by PV and development team.

1.2 REFERENCES

External

[1] *TEKELEC Acronym Guide*, MS005077, Latest Revision

[2] SDS 7.3 Cloud Installation and Configuration Guide, E64816-03, Latest Revison

[3] Productizing Cloud Deployable DSR, FE007596, Latest Revision.

1.3 ACRONYMS

Acronym	Meaning
DP	Database Processor
MP	Message Processor
NE	Network Element
NOAM	Network Operations, Administration & Maintenance
OAM	Operations, Administration & Maintenance
SDS	Subscriber Database System
SOAM	Systems Operations, Administration & Maintenance
VIP	Virtual IP
VM	Virtual Machine running specific server logic [eg DP VM would mean Virtual Machine running Database Processor Server logic]

Table 1 - Acronyms

1.4 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.

1.5 HOW TO USE THIS DOCUMENT

When executing this document, understanding the following helps to ensure that the user understands the manual's intent:

1)   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.

2)   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 (2.7).

2.0   DISASTER RECOVERY SCENARIOS

2.1   REPLACEMENT OF A DP SERVER

Note: This disaster recovery scenario also applies to DP Server(s) deployed in "Non-high Availability" redundancy model discussed in [3].

2.1.1   PRE CONDITION
- DP VM has stopped processing traffic
- It has been determined the DP VM is defective / corrupted and needs replacement

2.1.2   RECOVERY STEPS

1	**Note**: This step is optional and only executable if DP is powered on and functional. Stop software on DP server.	1. Login to DP SOAM GUI for the site where DP is located. 2. Select [Main Menu: Status & Manage → Server] and select DP by Hostname. 3. Click the 'Stop' button followed by the 'Ok' button on confirmation screen.
2	**Note**: This step is optional and only executable if DP is powered on and functional. Verify that no signaling traffic is processed at the DP.	1. Login to DP SOAM GUI for the site where DP is located. 2. Select [Main Menu: Status & Manage → KPIs] and select 'DP' tab. 3. Verify that 'Total Queries/Sec' KPI is now showing '0' for the DP's hostname.

3	Replace VM	For VMWare based deployments:
		 1. Launch the Cloud client of your choice eg "vSphere Client" and browse to the defective DP Server VM.
		 2. Power down DP VM and remove it from the inventory / disk.
		 3. Execute Procedure 1 *Create SDS Guests from OVA (VMWare)* from [2].
		
		 For KVM/OpenStack based deployments:
		 1. Login to the OpenStack control node.
		     i. "$ ssh admusr@node"
		 2. Power down DP VM and remove it from the inventory / disk:
		     i. "$ nova delete <vm-name>
		 3. Execute Procedure 2 *Create SDS Guests from OVA (KVM / OpenStack)* from [2].

4	Install the new DP server and wait for it to complete replication sync.	From reference [2], execute following procedures in sequence on new DP server.
		
		   a. Procedure 8.1 *Applying the Database Processor Configuration File (DP)*
		   b. Procedure 8.4 *Restarting the Database Processor Application (DP)*

5	Verify status and traffic.	1. Login to DP SOAM GUI for the site where DP is located. 2. Select [Main Menu: Status & Manage → KPIs] and select 'DP' tab. 3. Verify that 'Total Queries/Sec' KPI is now showing a non-zero value for the DP's hostname.

2.1.3   POST CONDITION

- DP server is processing traffic

2.2   REPLACEMENT OF A DP SOAM

Note: This disaster recovery scenario applies only to DP SOAM Server(s) deployed in "High Availability" redundancy model discussed in [3].

2.2.1   PRE CONDITION

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

2.2.2   RECOVERY STEPS

1 ☐	Prepare for VM replacement.	Identify the DP SOAM that needs replacement DP SOAM hostname = _____
2 ☐	Make DP SOAM server's Max Allowed HA Role "Standby" so it does not become active.	1. Go to the SDS GUI. 2. Select [Main Menu: Status & Manage → HA]. 3. Select the DP SOAM that needs replacement. 4. Change its "Max Allowed HA Role" to "Standby". 5. Click the "OK" button.
3 ☐	Remove DP SOAM from the server group.	1. Go to the SDS GUI. 2. Select [Main Menu: Configuration → Server Groups]. 3. Select DP SOAM's server group. 4. Click the "Edit" button. 5. Move DP SOAM out of the server group. 6. Click the "OK" button.

4 ☐	Replace VM	For VMWare based deployments:
		1. Launch the Cloud client of your choice eg "vSphere Client" and browse to the defective DP SOAM VM.
		2. Power down DP SOAM VM and remove it from the inventory / disk.
		3. Execute Procedure 1 ***Create SDS Guest from OVA (VMWare)*** from [2].
		
		For KVM / OpenStack based deployments:
		1. Login to the OpenStack control node.
		    i. "$ ssh admusr@node"
		2. Power down DP SOAM VM and remove it from the inventory / disk:
		    i. "$ nova delete \<vm-name\>
		3. Execute Procedure 2 to ***Create SDS Guest from OVA (KVM / OpenStack)*** from [2].

5 ⬛	Prepare the new DP SOAM server	Execute Procedure 6.2 *Applying the SOAM Server Configuration File* from reference [2].
6 ⬛	Add DP SOAM server to the server group and validate pairing	From reference [2], execute following procedures in sequence on new DP SOAM server. a. Procedure 7.2 *Adding a Server to the OAM Server Group (SOAM)* b. Procedure 7.3 *Restarting OAM Server Application (SOAM)*

2.2.3   POST CONDITION

o   DP SOAM is back in service

2.3   REPLACEMENT OF A QUERY SERVER

2.3.1   PRE CONDITION

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

2.3.2   RECOVERY STEPS

1 ☐	Prepare for server replacement.	Identify the Query server that needs replacement Query server hostname = _____
2 ☐	Make Query Server's Max Allowed HA Role "Standby" so it does not become active.	1. Go to the SDS GUI. 2. Select [Main Menu: Status & Manage → HA]. 3. Select the Query Server that needs replacement. 4. Change its "Max Allowed HA Role" to "OOS". 5. Click the "OK" button.
3 ☐	Remove Query Server from the server group.	1. Go to the SDS GUI. 2. Select [Main Menu: Configuration → Server Groups]. 3. Select the Query Server's server group. 4. Click the "Edit" button. 5. Move Query Server out of the server group. *6.* Click the "OK" button.

4 ☐	Replace VM	For VMWare based deployments:
		1. Launch the Cloud client of your choice eg "vSphere Client" and browse to 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].
		
		For KVM / OpenStack based deployments:
		1. Login to the OpenStack control node.
		    i. "$ ssh admusr@node"
		2. Power down Query Server VM and remove it from the inventory / disk:
		    i. "$ nova delete <vm-name>
		3. Execute Procedure 2 ***Create SDS Guest from OVA (KVM / OpenStack)*** from [2].

5 ☐	Prepare the new Query server	Execute Procedure 5.2 ***Applying the Query Server Configuration File*** from reference [2].

| 6 | Add Query Server to the server group and validate pairing | From reference [2], execute following procedures in sequence on new Query server.
    a.   Procedure 5.3 ***Adding the Query Server to the SDS Server Group***
    b.   Procedure 5.4 ***Restarting the Query Server Application*** |

2.3.3   *POST CONDITION*

- o   Query server is back in service

2.4   REPLACEMENT OF A SDS NOAM SERVER

Note: This disaster recovery scenario applies only to SDS NOAM Server(s) deployed in "High Availability" redundancy model discussed in [3].

2.4.1   PRE CONDITION

- SDS NOAM Server has stopped functioning
- It has been determined to replace the SDS NOAM Server

2.4.2   RECOVERY STEPS

1	Prepare for server replacement.	Identify the SDS NOAM Server that needs replacement Hostname = _____
2	Make SDS NOAM Server's Max Allowed HA Role "Standby" so it does not become active.	1. Go to the SDS GUI. 2. Select [Main Menu: Status & Manage → HA]. 3. Select the SDS that needs replacement. 4. Change its "Max Allowed HA Role" to "Standby". 5. Click the "OK" button.
3	Remove SDS from the server group.	1. Go to the SDS GUI. 2. Select [Main Menu: Configuration → Server Groups]. 3. Select Primary SDS's server group. 4. Click the "Edit" button. 5. Move SDS out of the server group. 6. Click the "OK" button.

4	Replace VM	For VMWare based deployments:
		
		1. Launch the Cloud client of your choice eg "vSphere Client" and browse to the defective SDS VM.
		2. Power down SDS VM and remove it from the inventory / disk.
		3. Execute Procedure 1 ***Create SDS Guest from OVA (VMWare)*** from [2].
		
		For KVM / OpenStack based deployments:
		
		1. Login to the OpenStack control node.
		    i. "$ ssh admusr@node"
		2. Power down DP VM and remove it from the inventory / disk:
		    i. "$ nova delete \<vm-name\>"
		3. Execute Procedure to 2 ***Create SDS Guest from OVA (KVM / OpenStack)*** from [2].

5	Prepare the new SDS NOAM Server	Execute Procedure 3.4 ***Applying the SDS NOAM Server Configuration File*** from reference [2].

6	Add SDS NOAM Server to the server group and validate pairing	From reference [2], execute following procedures in sequence on new SDS NOAM Server VM:
		   a. Procedure 4.2 ***Adding a Server to an OAM Server Group***
		   b. Procedure 4.3 ***Verifying the SDS NOAM Server Alarm Status***

2.4.3   POST CONDITION

    o SDS NOAM Server is back in service

2.5   REPLACEMENT OF SDS NOAM SERVER PAIR

Note: This disaster recovery scenario also applies to SDS NOAM Server(s) deployed in "Non-High Availability" redundancy model discussed in [3].

2.5.1   PRE CONDITION

- Active and Standby SDS NOAM Server [or Active only SDS NOAM Server deployed in Non-High Availability redundancy] have stopped functioning.
- It has been determined to replace both VM(s) that host SDS NOAM Servers [1 SDS NOAM Server in case of Non-High Availability redundancy].
- Recent backup archives of SDS configuration and provisioning databases are available

2.5.2   RECOVERY STEPS

1	Determine SDS backup archive	Make sure that you have access to SDS backup archive that contains provisioning data as well as configuration data. This backup archive should be in uncompressed format.

2	Replace old SDS VMs with new SDS VMs.	For VMWare based deployments:
		
		1. Launch the Cloud client of your choice eg "vSphere Client" and browse to the defective SDS VMs.
		2. Power down SDS VM(s) and remove it from the inventory / disk.
		3. Execute Procedure 1 *Create SDS Guest from OVA (VMWare)* from [2].
		
		For KVM / OpenStack based deployments:
		
		1. Login to the OpenStack control node.
		    i. "$ ssh admusr@node"
		2. Power down SDS VM(s) and remove it from the inventory / disk:
		    i. "$ nova delete <vm-name>
		3. Execute Procedure 2 *Create SDS Guest from OVA (KVM / OpenStack)* from [2].

3	Configure the new SDS A server	Execute Procedure 3 *Configuring SDS NOAM Servers A and B* for from reference [2] for only SDS A Server.

5	Copy SDS backup archive to new SDS A server.	1. Login via SSH to the console of new SDS NOAM Server.
		2. Copy /etc/hosts file from another SDS NOAM Server to this server.
		3. Copy the uncompressed backup archive identified in step 1 to /var/TKLC/db/filemgmt area on newly installed first SDS NOAM Server.
		4. Execute "sudo `prod.dbup`" to stop running applications.
		Leave database running.
		5. Restore the configuration DB by executing
		`idb.restore -n -t /var/TKLC/db/filemgmt -v <full path to configuration archive file>`
		6. Restore the provisioning DB by executing
		`idb.restore -n -t /var/TKLC/db/filemgmt -v <full path to provisioning archive file>`
		Note: This step may take up time depending upon the size of provisioning database.
		7. SDS database is now restored. Start application by executing "sudo `prod.start`".

6	Re-exchange SSH keys for remote import/export/data servers.	1. Login to the Primary SDS GUI as admin user using VIP address. 2. Perform SSH key exchange for Remote Export using this screen [**Main Menu: SDS → Configuration → Options**] 3. Perform SSH key exchange for Remote Import using this screen [**Main Menu: SDS → Configuration → Options**] 4. Perform SSH key exchange for Data Export using this screen [**Main Menu: Administration → Remote Servers → Data Export**]
7	Install the new second SDS NOAM Server [Optional for Non-High Availability redundancy]	Follow recovery steps from section 2.4 of this document to restore 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   REPLACEMENT OF DP SOAM SERVER PAIR

Note: This disaster recovery scenario also applies to DP SOAM Server(s) deployed in "Non-High Availability" redundancy model discussed in [3].

2.6.1   PRE CONDITION

- o Active and Standby DP SOAM servers [or Active only DP SOAM server deployed in Non-High Availability redundancy] have stopped functioning
- o It has been determined to replace both VM(s) that host DP SOAM [1 DP SOAM server in case of Non-High Availability redundancy].
- o Access to Primary SDS GUI is available
- o DPs are not receiving provisioning database updates.

2.6.2   RECOVERY STEPS

1	Prepare for server replacement.	Identify the DP SOAM server VM(s) that needs replacement DP SOAM 1 = _____ DP SOAM 2 = _____

2	Replace old SDS DP SOAM VMs with new SDS SOAM VMs.	For VMWare based deployments:
		
		1. Launch the Cloud client of your choice eg "vSphere Client" and browse to the defective DP SOAM VM(s).
		2. Power down SDS SOAM VM(s) and remove it from the inventory / disk.
		3. Execute Procedure 1 ***Create SDS Guest from OVA (VMWare)*** from [2] for each DP SOAM server VM to be replaced.
		
		For KVM / OpenStack based deployments:
		
		1. Login to the OpenStack control node.
		     i. "$ ssh admusr@node"
		2. Power down defective DP SOAM VM(s) and remove it from the inventory / disk:
		     i. "$ nova delete <vm-name>"
		3. Execute Procedure 2 ***Create SDS Guest from OVA (KVM / OpenStack)*** from [2].

3	Prepare the new SDS SOAM servers	Execute Procedure 6.2 ***Applying the SOAM Server Configuration File*** for SDS SOAM Server(s) from reference [2].
5	Add Query Server to the server group and validate pairing	From reference [2], execute procedure 7.3 ***Restarting the OAM Server Application (SOAM)*** for each DP SOAM server VM to be replaced.

6	Verify that DP SOAM servers received SDS provisioning	1. Login to active DP SOAM GUI using VIP address.
		2. Select [Main Menu: Status & Manage → Servers] screen.
		3. Make sure that new DP SOAM server(s) show 'Norm' for DB, Reporting Status and Appl State.

2.6.3   POST CONDITION

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

2.7   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:

a. For the first set of menu options, select: 2, "New Service Request".
    You will hear another set of menu options.

b. In this set of menu options, select: 3, "Hardware, Networking and Solaris Operating System Support".
    A third set of menu options begins.

c. 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.