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SDS Disaster Recovery User's Guide

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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 disaster scenarios related to SDS 8.2 product.

The disaster scenarios covered in document are:

1. Connectivity loss to Primary SDS NOAM Servers and DR SDS site activation.
2. A defective DP server
3. A defective Query Server
4. A defective SOAM server
5. A defective SDS NOAM Server
6. A defective SDS NOAM Server pair
7. A defective SOAM server pair
8. A defective CISCO switch
9. Total loss of SDS frame.
10. Total loss of SOAM frame.

This document is intended for execution by My Oracle Support (MOS) on fielded SDS systems.

It also could be used at Oracle by PV and development team.

1.2 References

External *(Customer Facing)**:***

[1] SDS 8.2 Initial Installation Guide
[2] TPD Initial Product Manufacture, Software Installation Procedure
[3] Oracle@ Communication Tekelec Platform 7.2 Configuration Guide
[4] DSR 7.1 3-Tier Disaster Recovery Guide
[5] DSR 8.2 Disaster Recovery Guide
[6] DSR / SDS 8.x NOAM Failover User's Guide
[7] Cabinet Assembly Instructions, 910-6083-001

1.3 Acronyms

Acronym	Meaning
CSV	Comma Separated Values
DP	Database Processor
IMI	Internal Management Interface
ISL	Inter-Switch-Link
MP	Message Processor
NE	Network Element
NOAM	Network Operations, Administration & Maintenance
OAM	Operations, Administration & Maintenance
SDS	Subscriber Data Server
RMM	Remote Management Module
SOAM	Systems Operations, Administration & Maintenance
TPD	Tekelec Platform Distribution (Linux OS)
VIP	Virtual IP
XMI	External Management Interface

Table 1 - Acronyms

1.4 Assumptions

This procedure assumes the following;

- The user conceptually understands the topology of SDS and the 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, then please STOP and contact My Oracle Support (as described in **Appendix A**).

2.0 DISASTER RECOVERY SCENARIOS

!!WARNING!!

Whenever there is need to restore the database backup for NOAM and SOAM servers in any of below Recovery Scenarios, the backup directory may not be there in the system as system will be DRed.

In this case, please refer to 1.1.1.1Appendix E: Backup directory, this will provide steps to check and create the backup directory.

2.1 Complete connectivity loss of Primary SDS NOAM Servers

2.1.1 Pre Condition

- User cannot access Primary SDS site GUI
- User can access DR SDS GUI
- Provisioning clients are disconnected from the primary SDS
- Provisioning has stopped

2.1.2 Recovery Steps

In order to quickly make SDS GUI accessible and provisioning to continue, Follow the below instructions: .

1. Promoting the DR NOAM from Secondary to Primary follow reference [6]
2. Recover Primary NOAM as DRNO follow reference [6]

2.1.3 Post Condition

- GUI on the new Primary SDS is accessible
- 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

Note: To swap new Primary SDS and new DR SDS sites back to their original roles, please execute Step 8 on new-Primary SDS (old-DR SDS) and step 2 on new-DR SDS (old-Primary SDS) from Procedure 1 (Demoting the Active NOAM from Primary to Secondary) in refernce [6].

2.2 Replacement of a DP server

2.2.1 Pre Condition

- DP server has stopped processing traffic
- It has been determined the DP server is defective and needs replacement
- New DP server is available

2.2.2 Recovery Steps

1 ☐	Prepare the defective DP server for the replacement.	Identify the defective DP server that needs to be replaced Defective DP server hostname = _____
2 ☐	Stop the application on the defective DP server.	1. Using VIP address, login to SOAM GUI site where defective DP server is located. 2. Navigate to GUI screen [**Main Menu: Status & Manage → Server**] 3. Select the defective DP server by its hostname. 4. Click the 'Stop' button followed by the 'Ok' button on confirmation screen.
3 ☐	Verify that no signaling traffic is processed at the defective DP server	1. Go to [**Main Menu: Status & Manage --> KPIs**] screen. 2. Click the KPI Filter icon on the right edge of the screen. 3. Select "DP" for Group and click the GO dialogue button. 4. Select the tab of the DP server to be recovered. 5. Verify that the "Total Queries/Sec" KPI is now showing "0" for this DP.
4 ☐	Power down the defective DP server.	Power down the defective DP server. **Note: If HW replacement is deemed necessary, physically remove defective DP blade and install new replacement blade** 1. Power down the defective DP server. 2. Label all cables connected to defective DP server. 3. Physically remove defective DP server from the frame. 4. To install the new DP blade use below step from reference [7] - Upgrade firmware on the Blade - Upgrade the BIOS of the blade - Set the iLO credentials userid/password of the blad 5. Power up the new DP server.
5 ☐	Install SDS application on the new DP server	Execute procedure 10, steps 1 through 22 (DP Installation) as described in reference [1]
6 ☐	Configure the new DP server	Execute procedure 10, steps 38 - 65 (Applying TKLCConfigData.sh file on the new DP server) as described in reference [1].
7 ☐	Disable hyperthreading on the new DP server	Execute steps as described in Appendix I (Disable Hyperthreading) from [1].
8 ☐	Restart the application on the new DP server	Execute procedure 10, steps 86 through 91 (Restarting the application on the new DP server) as described in reference [1]

9 ☐	Verify status and traffic.	1. Go to [Main Menu: Status & Manage --> KPIs] screen. 2. Click the KPI Filter icon on the right edge of the screen. 3. Select "DP" for Group and click the GO dialogue button. 4. Select the tab of the DP server to be recovered. 5. Verify that the "Total Queries/Sec" KPI now showing a non-zero value for this DP
10 ☐	Verify comAgent connections	**1.** Navigate to GUI Screen **[Main Menu: Communication Agent --> Maintenance --> Connection Status].** 2. Verify comAgent connections (Automatic & Configured).

2.2.3 Post Condition

- DP server is processing traffic

2.3 Replacement of a SOAM Server

2.3.1 Pre Condition

- SOAM serevr has stopped functioning
- It has been determined to replace the blade hosting SOAM server
- New blade replacement is available
- SDS GUI is accessible

2.3.2 Recovery Steps

1 ☐	Prepare for server replacement.	Identify the SOAM server that needs replacement Defective SOAM server hostname = _____
2 ☐	Make SOAM server's Max Allowed HA Role "Standby" so it does not become active.	1. Login to the Primary SDS GUI as admin user using VIP address. 2. Navigate to GUI screen [**Main Menu: Status & Manage → HA**] 3. Click 'Edit' button 4. Change "Max Allowed HA Role" of the defective SOAM server to 'Standby' 5. Click OK button
3 ☐	Remove SOAM server from the server group.	1. Navigate to GUI screen [**Main Menu: Configuration → Server Groups**]. 2. Select SOAM's server group. 3. Click the "Edit" button. 4. Under "SG Inclusion", uncheck the defective SOAM server. 5. Click the "OK" button.
4 ☐	Remediate hardware and Recover DSR services	Remediate OAM blade hardware and restore TVOE network configuration in accordance with the DSR 8.2 Disaster Recovery Guide [5].
5 ☐	Install SDS application on he new SOAM server	Execute Procedure 8, steps 1 through 22 (Installing the SDS Application) from reference [1].
6 ☐	Prepare the new SOAM server	Execute Procedure 8, steps 45 through 74 (Applying TKLCConfigData.sh file on the new SOAM server) from reference [1].
7 ☐	Add the new SOAM server back to the server group	Execute procedure 9, steps 14 through 20 (Adding new SOAM server back to the Server Group) from reference [1].
8 ☐	Restart the application on the new SOAM server	Execute procedure 9, steps 26 through 32 (Restarting application on new SOAM server) from reference [1].

2.3.3 Post Condition

- SOAM server is back in the service

2.4 Replacement of a Query server

2.4.1 Pre Condition

- Query server has stopped functioning
- It has been determined to replace the Query server
- New Query server replacement is available

2.4.2 Recovery Steps

1 ☐	Prepare for Query server replacement.	Identify the defective Query server that needs replacement Defective Query server hostname = _____
2 ☐	Remove the defective Query Server from the server group.	1. Go to the SDS GUI. 2. Navigate to GUI screen [**Main Menu: Configuration → Server Groups**] 3. Select Query Server's server group. 4. Click the "Edit" button. 5. Under "SG Inclusion", uncheck the defective Query server. 6. Click the "OK" button.
3 ☐	Power down and replace Query Server	1. Power down the defective Query server. 2. Label all cables connected to the defective Query server. 3. Physically remove the defective Query server from the frame 4. All connections should be made to the replacement server according to the labels attached in **sub-step 2** of the same step 5. Power up the new Query server 6. To install the new Query Server use below step from reference [7] - check/upgrade firmware on the Blade - upgrade the BIOS of the blade - set the iLO credentials userid/password of the blade
4 ☐	Install SDS application on the new Query server	Execute Procedure 1 (Installing the SDS Application on the new Query server) as described in reference [1].
5 ☐	Prepare the new Query server	Execute procedure 4, steps 17 through 43 (Applying TKLCConfigData.sh file on the new Query server) as described in reference [1].
6 ☐	Add the new Query server back to SDS NOAM Server group	Execute procedure 4, steps 44 through 50 (Adding query server back to SDS NOAM Server group) as described in reference [1].
7 ☐	Restart the application on the new Query server	Execute procedure 4, steps 51 through 56 (Restarting SDS application on the query server) as described in reference [1].

2.4.3 Post Condition

- Query server is back in service

2.5 Replacement of a SDS NOAM Server

2.5.1 Pre Condition

- SDS NOAM Server has stopped functioning
- It has been determined to replace the defective SDS NOAM Server
- New SDS NOAM Server replacement is available

2.5.2 Recovery Steps

1 ☐	Prepare for server replacement.	Identify the defective SDS NOAM Server that needs replacement Defective SDS NOAM Server hostname = _____
2 ☐	Make the defective SDS NOAM Server "Standby" so it does not become active.	1. Login to the Primary SDS GUI as admin user using VIP address. 2. Navigate to GUI screen [**Main Menu: Status & Manage → HA**] 3. Click 'Edit' button 4. Change "Max Allowed HA Role" of the defective SDS NOAM Server to 'Standby' 5. Click OK button
3 ☐	Remove SDS NOAM Server from the server group.	1. Navigate to GUI screen [**Main Menu: Configuration → Server Groups**] 2. Select SDS's server group. 3. Click the "Edit" button. 4. Under "SG Inclusion", uncheck the defective SDS NOAM Server 5. Click the "OK" button.
4 ☐	Power down and replace SDS NOAM Server	1. Power down the defective SDS NOAM Server. 2. Label all cables connected to the defective SDS NOAM Server. 3. Physically remove the defective SDS NOAM Server from the frame 4. All connections should be made to the replacement server according to the labels attached in **sub-step 2** of the same step. 5. Power up the new SDS NOAM Server 6. To install the new NOAM Server use below step from reference [7] - check/upgrade firmware on the Blade - upgrade the BIOS of the blade - set the iLO credentials userid/password of the blade
5 ☐	Install the SDS application on new SDS NOAM Server	Execute Procedure 1 (Installing the SDS Application) from reference [1].
6 ☐	Prepare SDS NOAM Server	Execute procedure 2, steps 26 through 49 , then Steps 52-55. (Applying TKLCConfigData.sh file on the new SDS NOAM Server) from reference [1].
7 ☐	Add the new SDS NOAM Server back to the server group	Execute procedure 3, steps 1, 13 through 25 (Pairing SDS NOAM Servers) from reference [1]. SDS NOAM Server.

8 ☐	Restart the application on new SDS NOAM Server	Execute procedure 3, steps 26 through 40 (Paring the SDS NOAM Servers SDS NOAM Server) from reference [1].
9 ☐	Re-exchange SSH keys for Remote Import, Remote Export, and Data Export features	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**] 1. Perform SSH key exchange for Data Export using this screen [**Main Menu: Administration → Remote Servers → Data Export**]
10 ☐	Install Netbackup Client Software (optional)	1. Execute steps as described in Appendix B

2.5.3 Post Condition

- SDS NOAM Server is back in service

2.6 Replacement of Primary SDS NOAM Server pair

2.6.1 Pre Condition

- Primary SDS-A, Primary SDS-B, and Primary SDS Query servers have stopped functioning
- **DR SDS NOAM Servers are NOT available or are NOT installed**
- It has been determined to replace Primary SDS NOAM Servers
- New Primary SDS NOAM Servers for replacement are available
- Recent backup archives of SDS configuration and provisioning databases are available

NOTE: If DR SDS NOAM Servers are available, then follow recovery steps from Section 2.1 of this document

2.6.2 Recovery Steps

1 ☐	Determine SDS backup archive files	Make sure that you have access to SDS Configuration and Provisioning backup archive files
		
		Configuration backup archive file _____
		Provisioning backup archive file _____
		
		1. Note: The backup archive files should be in uncompressed format.
		If it is not uncompress then please execute following commands.
		
		For gunzip file:
		$ gunzip Backup.sds.sds1-noa-1191038.Configuration.NETWORK_OAMP.20160609_021511.AUTO.tar.gz
		
		$ gunzip Backup.sds.sds1-noa-1191038.Provisioning.NETWORK_OAMP.20160609_021511.AUTO.tar.gz
		
		For bunzip file:
		$ bunzip2 Backup.sds.sds1-noa-1191038.Configuration.NETWORK_OAMP.20160609_021511.AUTO.tar.bz2
		
		$ bunzip2 Backup.sds.sds1-noa-1191038.Provisioning.NETWORK_OAMP.20160609_021511.AUTO.tar.bz2

2 ☐	Power down and remove all defective Primary SDS NOAM Servers. Replace them with new SDS NOAM Servers.	1. Power down all defective SDS NOAM Servers. 2. Label all cables connected to defective SDS NOAM Servers. 3. Physically remove defective SDS NOAM Servers from the frame. 4. Follow reference [7] for the physical installation of new SDS NOAM Servers. 5. Wire in the new SDS NOAM Servers according to the cables you labeled and removed from the old servers. 6. To install the new NOAM Server use below step from reference [7] - check/upgrade firmware on the Blade - upgrade the BIOS of the blade - set the iLO credentials userid/password of the blade

3 ☐	Install the SDS application on the new Primary SDS-A server	Execute Procedure 1 on the new Primary SDS-A server (Installing the SDS Application) from reference [1].
4 ☐	Configure temporary IP address	Configure temporary external IP address on the new Primary SDS-A server, as described in Appendix C of [1]

5 ☐	Copy SDS backup archive files to the new Primary SDS-A server.	1. Login via SSH to the console of the new Primary SDS-A server.
		2. Execute following commands on console:
		`sudo su -`
		`cd /var/TKLC/db/filemgmt`
		`mkdir backup`
		`chown awadmin:awadm backup`
		`chmod 775 backup`
		3. Copy the uncompressed backup archive files identified in step 1 to **`/var/TKLC/db/filemgmt/backup`** area on newly installed Primary SDS-A server.
		4. Execute this command to stop running applications. Leave database running.
		`# prod.stop`
		5. Restore the configuration DB by executing this command
		`# idb.restore -n -t /var/TKLC/db/filemgmt/backup/ -v <full path to configuration archive file name>`
		6. SDS database is now restored. Start application by executing
		`# prod.start`
		7. Exit out of root:
		`# exit`

6 ☐	Prepare the new Primary SDS-A server	Execute procedure 2, steps 26 through 49 and steps 53 through 55 on the new Primary SDS-A server (Applying TKLCConfigData.sh file) from reference [1].
7 ☐	Install the SDS application on the new Primary SDS-B server	Execute Procedure 1 on the new Primary SDS-B server (Installing the SDS Application) from reference [1].
8 ☐	Prepare the new Primary SDS-B server	Execute procedure 2, steps 26 through 49 and steps 53 through 56 on the new Primary SDS-B server (Applying TKLCConfigData.sh file) from reference [1].
9	Restore Provisioning Database	Follow steps in **Appendix C**.
10 ☐	Install the SDS application on the new Primary SDS Query server	To install the new Query Server use below step from reference [1] - check/upgrade firmware on the Blade - upgrade the BIOS of the blade - set the iLO credentials userid/password of the blade Execute Procedure 1 on the new Primary SDS Query server (Installing the SDS Application) from reference [1].

11 ☐	Prepare the new Primary SDS Query server	Execute procedure 4, steps 17 through 43 and steps 52 through 57 on the new Primary SDS Query server (Applying TKLCConfigData.sh file) from reference [1].
12 ☐	Restart the application on all new Primary SDS NOAM Servers	1. Login to the Primary SDS GUI as admin user using VIP address 2. Navigate to GUI screen [**Main Menu: Status & Manage → Server**] 3. Select the Primary SDS-A server 4. Click the "Restart" button 5. In pop-up window, click the "OK" button to confirm Repeat all above for Primary SDS-B server, and Primary SDS Query server
13 ☐	Install Netbackup Client Software on Primary SDS-A and Primary SDS-B servers (optional)	Execute steps as described in Appendix B
14 ☐	Re-exchange SSH keys for Remote Import, Remote Export, and Data Export features	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**]

2.6.3 Post Condition

- Primary SDS-A, Primary SDS-B, and Primary SDS Query servers are back in service
- Provisioning clients are connected to SDS VIP address
- Provisioning continues

2.7 Replacement of SOAM server pair

2.7.1 Pre Condition

- Both SOAM-A and SOAM-B servers have stopped functioning
- It has been determined to replace both blades that host SOAM servers
- New blades for replacement are available
- Access to Primary SDS GUI is available
- DPs are not receiving provisioning database updates.

2.7.2 Recovery Steps

1 ☐	Prepare for server replacement.	Identify the SOAM-A and SOAM-B servers that needs replacement SOAM-A Server: _____ SOAM-B Server: _____ SOAM Network Element name _____
2 ☐	Inhibit database replication for defective SOAM servers and DP servers associated with this SOAM network element. Note: It is expected that each SOAM and subtending DP will have a DB Level of "UNKNOWN" until the SOAMs are restored.	1. Go to the NOAMP GUI. 2. Select [**Main Menu: Status & Manage → Database**] screen 3. Filter on the SOAM Network Element name. 4. Record the DP server hostnames (Role: MP). 5. Click “Inhibit Replication” button for each DP server until all DP servers associated with this SOAM Network Element have been inhibited 6. "Inhibiting" SOAM server: Click “Inhibit Replication” button for each defective SOAM servers identified in the above step 1
3 ☐	Remediate OAM blade hardware and restore TVOE network configuration.	Remediate OAM blade hardware and restore TVOE network configuration in accordance with the DSR 8.2 Disaster Recovery Guide [5].
4 ☐	Install SDS application on the new SOAM-A server	Execute Procedure 8, steps 1 through 22 (Installing the SDS Application on SOAM server) from reference [1].
5 ☐	Install SDS application on the new SOAM-B server	Execute Procedure 8, steps 1 through 22 (Installing the SDS Application on SOAM server) from reference [1].
6 ☐	Prepare the new SOAM-A server	Execute Procedure 8, steps 45 through 76 (Applying TKLCConfigData.sh file on SOAM server) from reference [1]

7 ☐	Prepare the new SOAM-B server	Execute Procedure 8, steps 45 through 48, 50 through 70 and 72 through 76 (Applying TKLCConfigData.sh file on SOAM server) from reference [1]
8 ☐	Allow database replication for SOAM-A and SOAM-B servers and DP servers associated with this SOAM network element.	1. Go to the NOAMP GUI. 2. Select [**Main Menu: Status & Manage → Database**] screen 3. Filter on the SOAM Network Element name. 4. Record the DP server hostnames (Role: MP). 5. Allowing Replication: Click "Allow Replication" button for each newly replaced SOAM-A and SOAM-B servers 6. Allowing Replication: Click "Allow Replication" button for each DP server until all DP servers associated with this SOAM Network Element have been inhibited
9 ☐	Restart the application on the new SOAM-A server	Execute procedure 9, steps 26 through 32 (Restarting application on SOAM server) from reference [1].
10 ☐	Restart the application on the new SOAM-B server	Execute procedure 9, steps 26 through 29 and 33 through 35 (Restarting application on SOAM server) from reference [1].
11 ☐	Verify that SOAM servers receive SDS provisioning	1. Login to active SOAM GUI using VIP address. 2. Select [**Main Menu: Status & Manage → Servers**] screen. 3. Make sure that new SOAM servers show 'Norm' for DB, Reporting Status and Appl State.
12 ■	Verify that SOAM servers showng valid DB level	1. Go to the SOAM GUI. 2. Select [**Main Menu: Status & Manage → Database**] screen 3. Verify that a valid DB Level is now showing for each SOAM and subtending DP.

2.7.3 Post Condition

- Both SOAM servers are back in service
- DPs are now receiving provisioning updates

2.8 Replacement of DR SDS NOAM Server pair

2.8.1 Pre Condition

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

2.8.2 Recovery Steps

1 ☐	Prepare for server replacement.	Identify the DR SDS NOAM Servers that needs replacement DR SDS-A Server: _____ DR SDS-B Server: _____ DR SDS Query Server: _____
2 ☐	Power down and remove all defective DR SDS NOAM Servers. Replace them with new servers.	1. Power down all defective DR SDS NOAM Servers. 2. Label all cables connected to defective DR SDS NOAM Servers. 3. Physically remove defective DR SDS NOAM Servers from the frame. 4. Wire in the new DR SDS NOAM Servers according to the cables you labeled and removed from the old servers. 5. To install the new DR SDS NOAM Server use below step from reference [1] - check/upgrade firmware on the Blade - upgrade the BIOS of the blade - set the iLO credentials userid/password of the blade.
3 ☐	Install the SDS application on the new DR SDS-A server	Execute Procedure 1 on the new DR SDS-A server (Installing the SDS Application) from reference [1].
4 ☐	Prepare the new DR SDS-A server	Execute procedure 5, steps 22 through 45 on the new DR SDS-A server (Applying TKLCConfigData.sh file) from reference [1]. And then execute Procedure 6, steps 26 through 32 (Restarting application on DR SDS NOAM server) from reference [1].
5 ☐	Install the SDS application on the new DR SDS-B server	Execute Procedure 1 on the new DR SDS-B server (Installing the SDS Application) from reference [1].
6 ☐	Prepare the new DR SDS-B server	Execute procedure 5, steps 22 through 45 on the new DR SDS-B server (Applying TKLCConfigData.sh file) from reference [1]. And then execute Procedure 6, steps 26 through 32 (Restarting application on DR SDS NOAM server) from reference [1].
7 ☐	Install the SDS application on the new DR SDS Query server	Execute Procedure 1 on the new DR Query server (Installing the SDS Application) from reference [1].
8 ☐	Prepare the new DR SDS Query server	Execute procedure 4, steps 17 through 43 on the new Query server (Applying TKLCConfigData.sh file) from reference [1] and then execute Procedure 4 (Configuring the Query Server), steps 54 through 56 (Restarting application on DR SDS Queryserver) from reference [1].

9 ■	Verify DB level	Navigate to the **[Main Menu: Status & Manage --> Database]** screen to verify that a valid DBLevel is now showing for each DR NOAM and DR site Query Server. NOTE: Any value except "UNKNOWN" and "0" is valid for DB level.
10 ☐	Install Netbackup Client Software on DR SDS-A, and DR SDS-B servers (optional)	Execute steps as described in Appendix B
11 ☐	Re-exchange SSH keys for Remote Import, Remote Export, and Data Export features	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**] Perform SSH key exchange for Data Export using this screen [**Main Menu: Administration → Remote Servers → Data Export**]

2.8.3 Post Condition

- All DR SDS NOAM Servers are back in service

2.9 Replacement of SDS frame

2.9.1 Pre Condition

- SDS frame is destroyed
- A replacement SDS frame with 2 SDS NOAM Servers and a Query Server is available
- DR SDS NOAM Servers are available
- Access to DR SDS GUI is functional

2.9.2 Recovery Steps

1 ☐	Determine SDS site and status of provisioning	If the destroyed SDS frame was the Primary SDS frame, then execute procedure from refenrece [6] to activate DR SDS site as a new Primary SDS site. This allows provisioning to continue and makes the defective frame as a defective DR SDS frame.
2 ☐	Install new replacement DR SDS frame	Follow reference [2] to install new DR SDS frame.
3 ☐	Install DR SDS NOAM Servers in new DR SDS frame	Install new DR SDS NOAM Servers into new DR SDS frame by following instructions in reference [7].
4 ☐	Install switches in new DR SDS frame	Install new switches into new DR SDS frame by following instructions in reference [7]
5 ☐	Connect DR SDS NOAM Servers	Wire in the new DR SDS NOAM Servers by following instructions in reference[7].
6 ☐	Recover DR SDS NOAM Server pair	Follow recovery steps from **Section 2.8** of this document.
7 ☐	Recover Query server	Follow recovery steps from **Section 2.4** of this document.

2.9.3 Post Condition

- DR SDS frame is back in the service

2.10 Replacement of SOAM frame

2.10.1 Pre Condition

- SOAM frame is destroyed
- A replacement SOAM frame with 2 SOAM servers and DP servers is available

2.10.2 Recovery Steps

1 ☐	Install new SOAM frame	Follow procedures in reference [4]to install new SOAM frame.
2 ☐	Install SOAM Cabinet	Follow reference [5] for installation of HP BladeSystem enclosure.
3 ☐	Install DSR	Execute Recovery Scenario 1, of reference [4], DSR Disaster Recovery Guide, to restore DSR services.
4 ☐	Recover SOAM server pair	Follow recovery steps from **Section 2.7** of this document.
5 ☐	Recover DP servers	For each DP server, follow recovery steps from **Section 2.2** of this document.

2.10.3 Post Condition

- SOAM frame is back in service

Appendix A. 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 United States), 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 menu 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 one of Oracle's Tekelec Customers new to MOS.

Appendix B. INSTALL NETBACKUP CLIENT

Step	Procedure	Result

1. ☐	Install Netbackup Client Software	Execute *Section 3.10.5 Application NetBackup Client Install/Upgrade Procedures* of reference [3] to complete this step.
		
		NOTE: Location of the bpstart_notify and bpend_notify scripts is required for the execution of this step. These scripts are located as follows:
		
		`/usr/TKLC/appworks/sbin/bpstart_notify`
		
		`/usr/TKLC/appworks/sbin/bpend_notify`
		
		NOTE: Netbackup client software must be installed on each SDS NOAM Server

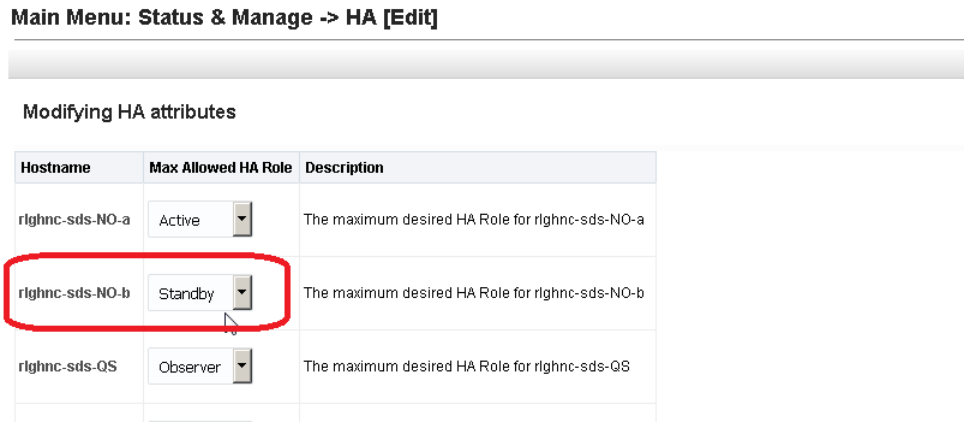
2. ☐	Link notify scripts to well-known path stated in the above step	Link the notify scripts to well-known path stated in the above step
		
		`ln -s <path>/bpstart_notify /usr/openv/netbackup/bin/bpstart_notify`
		
		`ln -s <path>/bpend_notify /usr/openv/netbackup/bin/bpend_notify`

3. ☐	Verify if the Netbackup port 1556 is opened for IPv4 protocol	Verify if the NetBackup port 1556 is opened on IPv4 protocol:
		`iptables -L 60sds-INPUT -n | grep 1556`
		If there is no output, then enable the port 1556 for NetBackup on IPv4:
		
		`iptablesAdm append --type=rule --protocol=ipv4 --domain=60sds --table=filter --chain=INPUT --match='-m state --state NEW -m tcp -p tcp --dport 1556 -j ACCEPT' --persist=yes`

4. ☐	Verify if the Netbackup port 1556 is opened for IPv6 protocol	Verify if the NetBackup port 1556 is opened on IPv6 protocol:
		`ip6tables -L 60sds -INPUT -n | grep 1556`
		If there is no output, then enable the port 1556 for NetBackup on IPv6 protocol:
		
		`iptablesAdm append --type=rule --protocol=ipv6 --domain=60sds --table=filter --chain=INPUT --match='-m state --state NEW -m tcp -p tcp --dport 1556 -j ACCEPT' --persist=yes`

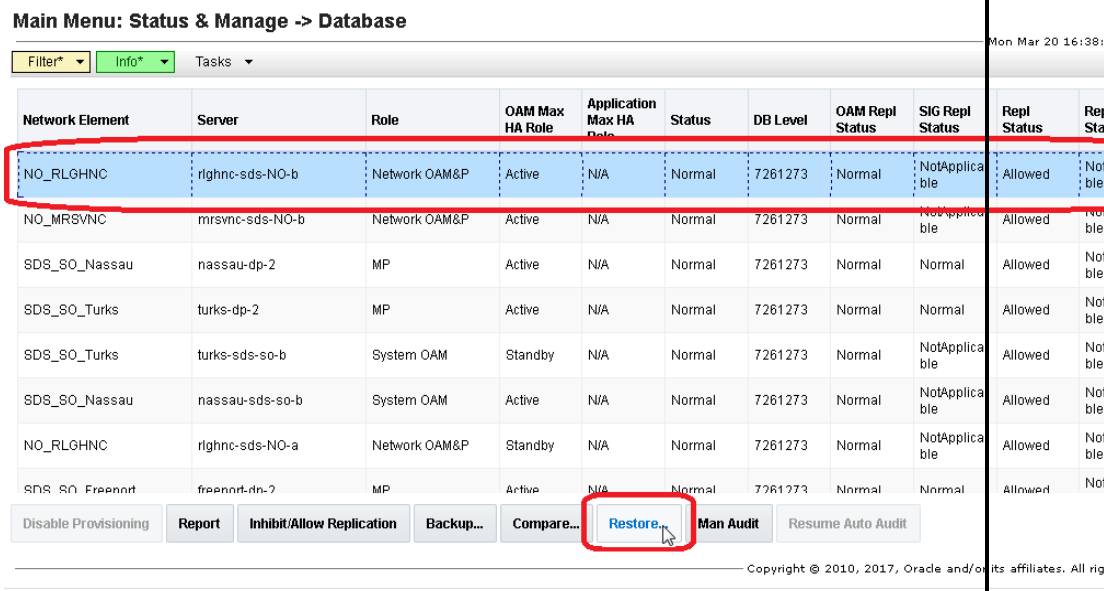
THIS PROCEDURE HAS BEEN COMPLETED		

Appendix C. RESTORE PROVISIONING DATABASE

1. ☐	Log into Primary SDS NOAM GUI	Log into Primary SDS NOAM GUI using its static IP (not the VIP).
2. ☐	Place the newly recovered Standby NOAM into Forced Standby	1. Navigate to **Main Menu: Status & Manage-> HA** 2. Click on **"Edit"** 3. Move the newly recovered standby server to forced standby. 

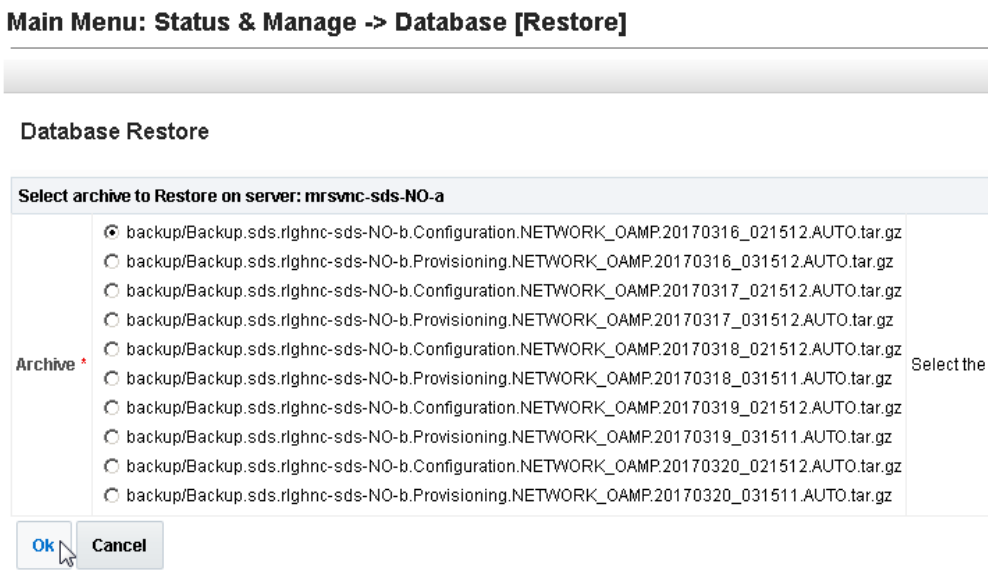
3. Restore Provisioning data ☐

1. Navigate to **Main Menu: Status & Manage -> Database**
2. Select Select Active NOAM and click the Restore button.

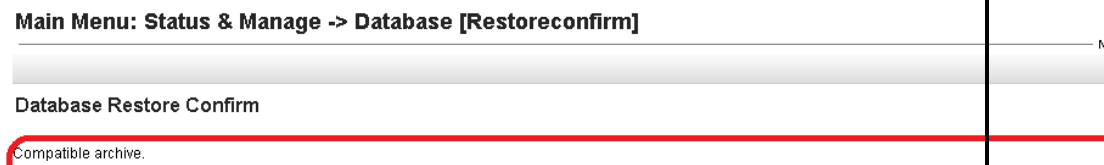


3. Select Provisioning backup file from the list (which was previously placed in /var/TKLC/db/filemgmt/backup directory in Step 5 of Section 2.6.2) and click the OK button.

Note: Must use a Provisioning only backup file. Combined backup files containing Configuration & Provisioning data will cause catastrophic issues which could lead to complete re-installation.

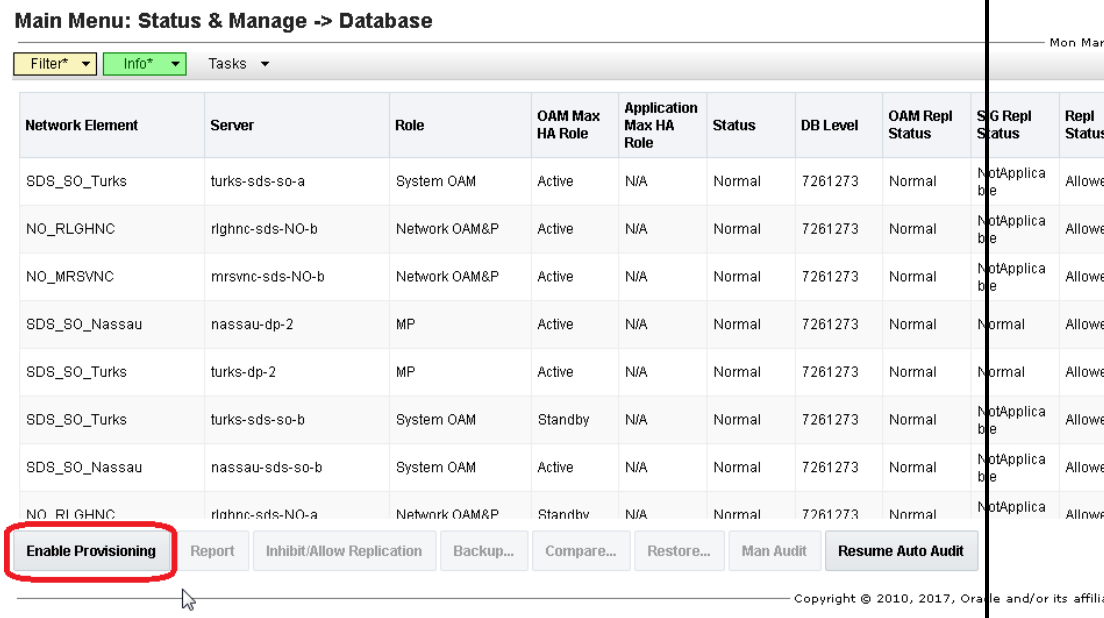


4. Verify Compatibility and select Ok to restore.



4. ☐	Wait for the restore to begin	Wait 60 seconds for the restore to begin.
5. ☐	Track Progress of Restore	Monitor the "Info" tab under the **[Status & Manage --> Database]** screen and look for the following message: Note: - Restore on <Active_NO_hostname> status MAINT_IN_PROGRESS.
6. ☐	Wait for the restore to complete	Continue to monitor the "Info" tab under the **[Status & Manage --> Database]** screen until the following message is received: Success: - Restore on rlghnc-sds-NO-b status MAINT_CMD_SUCCESS. Success NOTE: The "Info" tab may require manual refresh to see updated status. To refresh the "Info" tab, re-select **[Status & Manage --> Database]** from the Main Menu, then reselect the "Info" tab.
7. ☐	Uninhibit servers	Uninhibit All servers in the following staggered arrangement: 1. Uninhibit Active NOAM. 2. Refresh/monitor the [Status & Manage --> Database] screen until a valid "DB Level" appears for the Active NOAM. 3. Uninhibit Standby NOAM / Query Server. 4. Refresh/monitor the [Status & Manage --> Database] screen until a valid "DB Level" appears for the Standby NOAM / Query Server. 5. Uninhibit Active SOAMs. 6. Refresh/monitor the [Status & Manage --> Database] screen until a valid "DB Level" appears for the Active SOAMs. 7. Uninhibit Standby SOAMs / DPs. 8. Refresh/monitor the [Status & Manage --> Database] screen until a valid "DB Level" appears for the Standby SOAMs / DPs.
8. ☐	Recover Pdbrelay (IF NEEDED)	Verify whether PDB Relay is Enabled by following the instructions in **Appendix D**.

9. ☐	Enable Provisioning	Navigate to: [Status & Manage --> Database] and click “Enable Provisioning”



Network Element	Server	Role	OAM Max HA Role	Application Max HA Role	Status	DB Level	OAM Repl Status	SG Repl Status	Repl Status
SDS_SO_Turks	turks-sds-so-a	System OAM	Active	N/A	Normal	7261273	Normal	NotApplicable	Allowe
NO_RLGHNC	rlghnc-sds-NO-b	Network OAM&P	Active	N/A	Normal	7261273	Normal	NotApplicable	Allowe
NO_MRSVNC	mrsvnc-sds-NO-b	Network OAM&P	Active	N/A	Normal	7261273	Normal	NotApplicable	Allowe
SDS_SO_Nassau	nassau-dp-2	MP	Active	N/A	Normal	7261273	Normal	Normal	Allowe
SDS_SO_Turks	turks-dp-2	MP	Active	N/A	Normal	7261273	Normal	Normal	Allowe
SDS_SO_Turks	turks-sds-so-b	System OAM	Standby	N/A	Normal	7261273	Normal	NotApplicable	Allowe
SDS_SO_Nassau	nassau-sds-so-b	System OAM	Active	N/A	Normal	7261273	Normal	NotApplicable	Allowe
NO_RLGHNC	rlghnc-sds-NO-a	Network OAM&P	Standby	N/A	Normal	7261273	Normal	NotApplica	Allowe

10. ☐	Remove NO from forced standby.	1. Navigate to **Main Menu: Status & Manage -> HA** , click Edit. 2. Select the server which was moved to forced standby in **step 2**, change Max HA Role to Active and click OK.

Hostname	Max Allowed HA Role	Description
rlghnc-sds-NO-a	Active	The maximum desired HA Role for rlghnc-sds-NO-a
rlghnc-sds-NO-b	Active	The maximum desired HA Role for rlghnc-sds-NO-b
rlghnc-sds-QS	Observer	The maximum desired HA Role for rlghnc-sds-QS

THIS PROCEDURE HAS BEEN COMPLETED

Appendix D. RECOVER PDBRELAY

If, system fails to re-establish pdbrelay connection, follow the instructions:

Appendix D: Recover Pdbrelay

Step	Procedure	Result

1. ☐	Determine if pdbrelay is enabled	Execute following command on console of Active NOAM server (accessed via the VIP) and compare the output:
		`$ iqt -zhp -fvalue ProvOptions where "var='pdbRelayEnabled'"`
		`TRUE`
		`$`
		Proceed to next step only if the result of above command is true.

2. ☐	Disable pdbrelay	Uncheck PDB Relay Enabled checkbox under the **[SDS --> Configuration --> Options]** screen and Apply the change.
3. ☐	Emergency Restart (Start from Beginning of Cmd Log)	Execute following commad on console: `$ iset -fvalue=0 ProvOptions where "var='pdbRelayMsgLogTimeStamp'"`
4. ☐	Enable pdbrelay	Recheck PDB Relay Enabled checkbox under the **[SDS --> Configuration --> Options]** screen and Apply the change.
THIS PROCEDURE HAS BEEN COMPLETED		

Appendix E. BACKUP DIRECTORY

This workaround helps to create backup directory with correct permissions if required.

1 ☐	**NOAM/SOAM VIP console**: Determine if backup directory is created	Execute following command on console of Active NOAM/SOAM server (accessed via the VIP) and compare the output: **$ cd /var/TKLC/db/filemgmt/** **$ ls -ltr** Look for backup directory in the output. Check if directory is already created with correct permission. Directory will look like:- drwxrwx--- 2 awadmin awadm 4096 Dec 19 02:15 backup In case, directory is already there with right permissions then skip steps 2 and 3. If directory is not with right permissions then execute step 3. Otherwise go to next step.
2 ☐	**NOAM/SOAM VIP console:** Create backup directory	Assuming present working directory is **/var/TKLC/db/filemgmt/** Otherwise, do **cd /var/TKLC/db/filemgmt/** #Create backup directory $mkdir backup **Verify directory is created:-** **$ ls -ltr /var/TKLC/db/filemgmt/backup** Error should not come "No such file or directory". Rather it will show the directory, as directory will be empty it will show total 0 as content.

3 ☐	**NOAM/SOAM VIP console:** Change permissions of backup directory	Assuming backup directory is created
		
		Verify directory is created:-
		$ ls -ltr `/var/TKLC/db/filemgmt/backup`
		
		Error should not come "No such file or directory". Rather it will show the directory, as directory will be empty it will show total 0 as content.
		If directory is not created go to step 2. Else proceed.
		
		#Change permissions of backup directory
		$ chmod 770 `/var/TKLC/db/filemgmt/backup`
		
		#Change ownership of backup directory
		`$ sudo chown -R awadmin:awadm /var/TKLC/db/filemgmt/backup`
		
		`After changing the permissions and ownership of the backup directory.`
		
		`Directory will look like`
		`drwxrwx--- 2 awadmin awadm 4096 Dec 22 02:15 backup`

4 ☐	**NOAM/SOAM VIP console:** Copy the backup file which we need to restore in backup directory	Copy the backup file to backup directory $ `cp BACKUPFILE /var/TKLC/db/filemgmt/backup` Provide permissions to backup file inside backup directory. # Make sure about present working directory. $cd `/var/TKLC/db/filemgmt/backup` #Change permissions of files inside backup directory $chmod 666 Backup.* # Change ownership of files inside backup directory $ `sudo chown -R awadmin:awadm` Backup.*