Oracle® Communications User Data Repository

Cloud Disaster Recovery Guide

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Oracle Communications User Data Repository Cloud Disaster Recovery Guide, Release 12.2

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CAUTION: **Open an Service Request on MOS and confer with Oracle before executing Disaster Recovery Procedure**

Before recovering any system, please access My Oracle Support (MOS) (https://support.oracle.com) and review any MOS Alerts that relate to this procedure.

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 INTRODUCTION

1.1 Purpose and Scope

This document describes disaster recovery procedures used during disaster scenarios of the cloud based Oracle Communications User Data Repository 12.2 product.

This document is a guide to describe procedures used to execute disaster recovery for Oracle Communications User Data Repository Cloud deployments. This includes recovery of partial or a complete loss of one or more Oracle Communications User Data Repository virtual servers (Primary or DR). The audience for this document includes Oracle customers as well as the following internal groups: Software Development, Quality Assurance, Product Verification, Information Development, and Consulting Services including NPx.. This document provides step-by-step instructions to execute disaster recovery for Oracle Communications User Data Repository 12.2 Executing this procedure also involves referring to and executing procedures in existing support documents found in the reference section.

This document is intended for execution by Customer Service team on the fielded Oracle Communications User Data Repository 12.2 systems.

1.2 References

[1] *Oracle Communications User Data Repository 12.2Disaster Recovery Guide,* E72457-01, *latest revision*
[2] *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide,* E72454-01, *latest revision*
[3] *Oracle Communications User Data Repository Cloud Resource Profile, E71446-01, latest revision*

1.3 Acronyms

Acronym	Meaning
BIOS	Basic Input Output System
CD	Compact Disk
DR	Disaster Recovery
FRU	Field Replaceable Unit
IMI	Internal Management Interface
ISL	Inter-Switch-Link
NE	Network Element
MP Host Server	Server that contains one SOAM and two MPs
NOAMPP	Network Operations, Administration, Maintenance & Provisioning
ISO	Constains software images
OVA	Open Virtualization Archive
MOS	My Oracle Support
NAPD	Network Architecture Planning Diagram
SOAM	Systems Operations, Administration & Maintenance
TAC	Technical Assistance Centers
TPD	Tekelec Platform Distribution (Linux OS)
UDR	User Data Repository
VIP	Virtual IP
VM	Virtual Machine
XMI	External Management Interface

1.4 Terminology

Table 1. Terminology

Base hardware	Base hardware includes all hardware components (bare metal) and electrical wiring to allow a server to power on.
Base software	Base software includes installing the server's operating system: Tekelec Platform Distribution (TPD) and TVOE for the MP Host Servers only.
Failed server	A failed server in disaster recovery context refers to a server that has suffered partial or complete software and/or hardware failure to the extent that it cannot restart or be returned to normal operation and requires intrusive activities to re-install the software and/or hardware.

Enablement	The business practice of providing support services (hardware, software, documentation, etc) that enable a 3rd party entity to install, configuration, and maintain Oracle products for Oracle customers.
Software Centric	The business practice of delivering an Oracle software product, while relying upon the customer to procure the requisite hardware components. Oracle provides the hardware specifications, but does not provide the hardware, and is not responsible for hardware installation, configuration, or maintenance.

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:

- 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 and/or NOTES.

If a procedural STEP fails to execute successfully, please STOP and contact My Oracle Support (MOS).

2 GENERAL DESCRIPTION

Disaster recovery procedures falls into five basic categories. It is primarily dependent on the state of the NOAMP servers and SOAM servers:

Recovery of the entire site from a total outage	• All NOAMP servers failed • All SOAM servers failed • 1 or more MP servers failed
Recovery of one or more servers with at least one NOAMP server intact	• 1 or more NOAMP servers intact • 1 or more SOAM or MP servers failed
Recovery of the NOAMP pair with one or more SOAM servers intact	• All NOAMP servers failed • 1 or more SOAM servers intact
Recovery of one or more server with at least one NOAMP and one SOAM server intact.	• 1 or more NOAMP servers intact • 1 or more SOAM servers intact • 1 SOAM or 1 or more MP servers failed
Recovery of one or more servers with corrupt database	• Case 1: No Replication Channel • Case 2: Replication Channel Available

2.1 Complete Site Outage (All Servers)

This is the worst case scenario where all the servers in the site have suffered complete software failure. The servers are recovered using OVA images then restoring database backups to the active NOAMP and SOAM servers. Note: NOAMP servers which were originally installed by ISO instead of OVA will be recovered using ISO.

Database backups will be taken from customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage). If no backup files are available, the only option is to rebuild the entire network from scratch. The network data must be reconstructed from whatever sources are available, including entering all data manually.

2.2 Partial outage with one NOAMP server intact and both SOAMs failed

This case assumes that at least one NOAMP servers intact. All SOAM servers have failed and are recovered using OVA images. Database is restored on the SOAM server and replication will recover the database of the remaining servers.

2.3 Partial outage with both NOAMP servers failed and one SOAM server intact

Database is restored on the NOAMP and replication will recover the database of the remaining servers.

2.4 Partial outage with NOAMP and one SOAM server intact

The simplest case of disaster recovery is with at least one NOAMP and at least one SOAM servers intact. All servers are recovered using base recovery of software. Database replication from the active NOAMP and SOAM servers will recover the database to all servers.

2.5 Partial outage with Corrupt Database

Case 1: Database is corrupted, *replication channel is inhibited* (either manually or because of comcol upgrade barrier) and database backup is available.

Case 2: Database is corrupted but *replication channel is available*.

3 PROCEDURE OVERVIEW

This section lists the materials required to perform disaster recovery procedures and a general overview (disaster recovery strategy) of the procedure executed.

3.1 Required Materials

The following items are needed for disaster recovery:

1. A hardcopy of this document (E71445-01) and hardcopies of all documents in the reference list
2. Hardcopy of all NAPD performed at the initial installation and network configuration of this customer's site. If the NAPD cannot be found, escalate this issue within My Oracle Support (MOS) until the NAPD documents can be located.
3. Oracle Communications User Data Repository recent backup files: electronic backup file (preferred) or hardcopy of all Oracle Communications User Data Repository configuration and provisioning data.
4. Latest Network Element report: Electronic file or hardcopy of Network Element report.
5. The network element XML file used for the VMs initial configuration.

The software media referenced here may be acquired online from the Oracle e-Delivery service at `edelivery.oracle.com`

This document and others referenced here can be acquired online from the Oracle Document Repository at the followin URL:

http://docs.oracle.com/en/industries/communications/user-data-repository/index.html

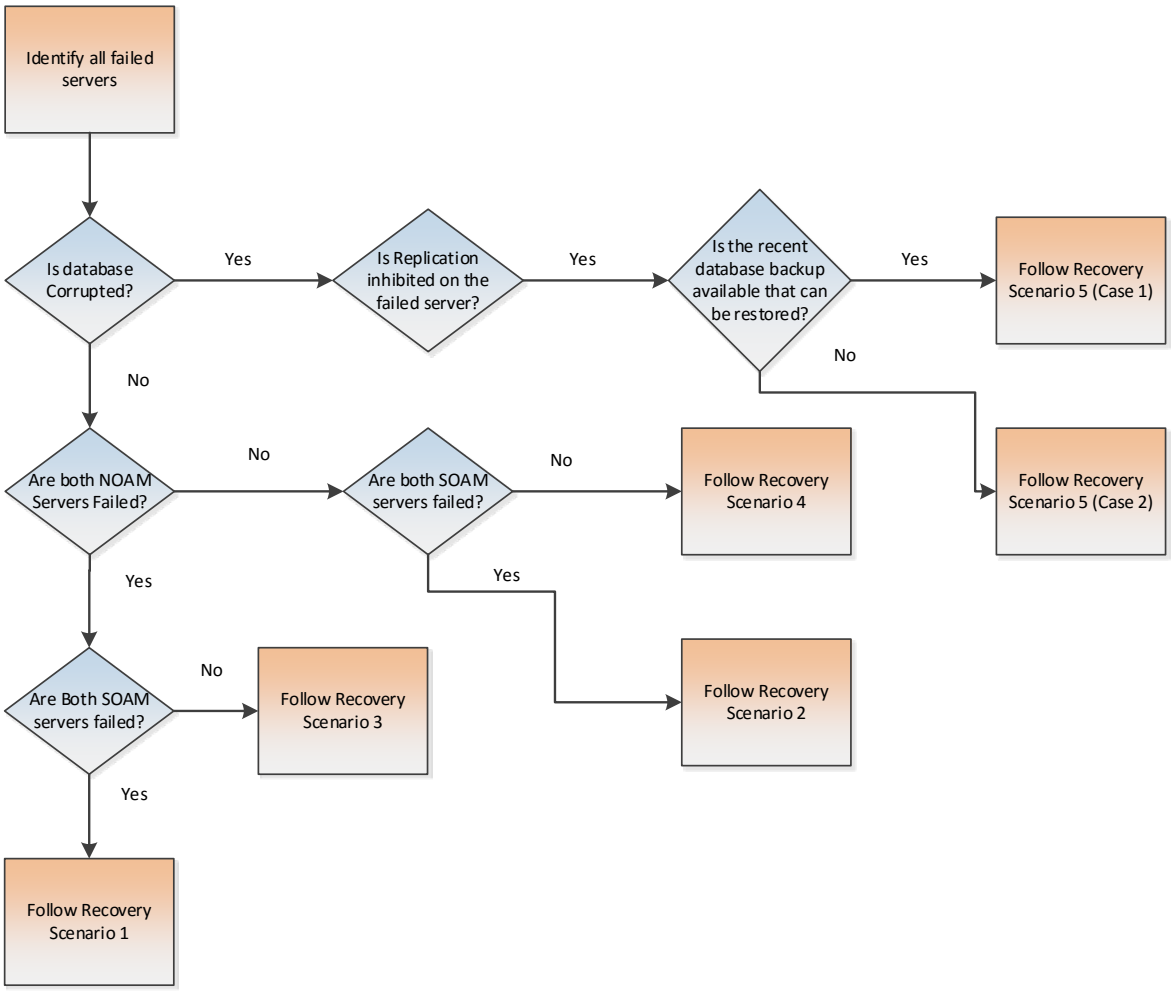
Note: For all Disaster Recovery scenarios, we assume that the NOAMP Database backup and the SOAM database backup were performed around the same time, and that no synchronization issues exist among them.

3.2 Disaster Recovery Strategy

Disaster recovery procedure execution is performed as part of a disaster recovery strategy with the basic steps listed below:

1. Evaluate failure conditions in the network and determine that normal operations cannot continue without disaster recovery procedures. This means the failure conditions in the network match one of the failure scenarios described in section 2.
2. Read and review the content in this document.
3. Gather required materials in section 3.1 **Required Materials**
4. From the failure conditions, determine the Recovery Scenario and procedure to follow (using Figure 1. Determining Recovery Scenario.
5. Execute appropriate recovery procedures (listed in section 4).

Figure 1. Determining Recovery Scenario



3.3 Procedure Preparation

Disaster recovery procedure execution is dependent on the failure conditions in the network. The severity of the failure determines the recovery scenario for the network. Use Table 2: Recovery Scenarios below to evaluate the correct recovery scenario and follow the procedure(s) listed to restore operations.

Note: A failed server in disaster recovery context refers to a server that has suffered partial or complete software failure to the extent that it cannot restart or be returned to normal operation and requires intrusive activities to re-deploy base software.

Table 2: Recovery Scenarios

Recovery Scenario	Failure Condition	Section
1	• All NOAMP servers failed. • All SOAM servers failed. • MP servers may or may not be failed.	Section Recovery Scenario 1 (Complete Site Outage)
2	• At least 1 NOAMP server is intact and available. • All SOAM servers failed. • MP servers may or may not be failed.	Section Recovery Scenario 2 (Partial Server Outage with one NOAMP server intact and both SOAMs failed)
3	• All NOAMP servers failed. • At least 1 SOAM server is intact and available. • MP servers may or may not be failed.	Section Recovery Scenario 3 (Partial Server Outage with all NOAMP servers failed and one SOAM server intact)
4	• At least 1 NOAMP server is intact and available. • At least 1 SOAM is intact and available. • 1 or more MP servers have failed.	Section Recovery Scenario 4 (Partial Server Outage with one NOAMP server and one SOAM server intact)
5	• Server is intact • Database gets corrupted on the server	Section Recovery Scenario 5 (Database Recovery)
5: Case 1	• Server is intact • Database gets corrupted on the server	Section Recovery Scenario 5: Case 1

	• Replication is inhibited (either manually or because of comcol upgrade barrier)	
5: Case 2	• Server is intact • Database gets corrupted on the server • Replication is occurring to the server with corrupted database	Section Recovery Scenario 5: Case 2

4 DISASTER RECOVERY PROCEDURE

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 prior to executing this procedure to ensure that the proper recovery planning is performed.

Before disaster recovery, users must properly evaluate the outage scenario. This check ensures that the correct procedures are executed for the recovery.

****** WARNING *******

****** WARNING *******

Note: *Disaster recovery is an exercise that requires collaboration of multiple groups and is expected to be coordinated by the TAC prime. Based on TAC's assessment of Disaster, it may be necessary to deviate from the documented process.*

4.1 Recovering and Restoring System Configuration

Disaster recovery requires configuring the system as it was before the disaster and restoration of operational information. There are 7 distinct procedures to choose from depending on the type of recovery needed. Only one of these should be followed (not all).

4.1.1 Recovery Scenario 1 (Complete Site Outage)

For a complete server outage, NOAMP servers are recovered using recovery procedures for software and then executing a database restore to the active NOAMP server. All other servers are recovered using recovery procedures for software.

Database replication from the active NOAMP server will recover the database on these servers. The major activities are summarized in the list below. Use this list to understand the recovery procedure summary. Do not use this list to execute the procedure. The actual detailed steps are in . The major activities are summarized as follows:

Recover Base software for all VMs:

- Recover the Virtual Machines hosting the NOAMPs and SOAMs
- Recover the **Active NOAMP** server by recovering the NOAMPs base software
- Recover the NOAMP database
- Reconfigure the application

Recover the **Standby NOAMP** server by recovering base software, for a Non-HA deployment this can be skipped.

- Reconfigure the Oracle Communications User Data Repository Application

Recover all SOAM and MP servers by recovering software, In a Non-HA deployment the Standby SOAM servers can be skipped.

- Recover the SOAM database
- Reconfigure the Oracle Communications User Data Repository Application
- Reconfigure the signaling interface and routes on the MPs, the Oracle Communications User Data Repository software will automatically reconfigure the signaling interface from the recovered database.

Restart process and re-enable provisioning replication

Note: Any other applications DR recovery actions (PCRF, etc) may occur in parallel. These actions can/should be worked simultaneously; doing so would allow faster recovery of the complete solution.

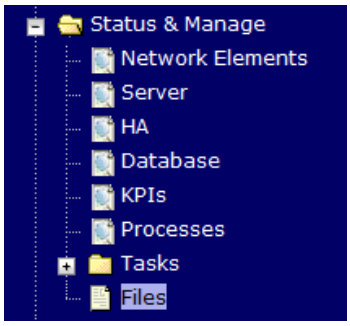
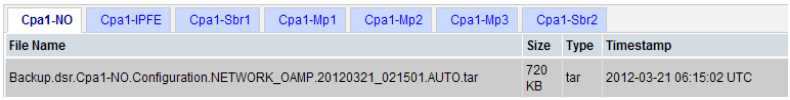
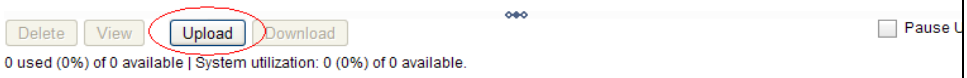
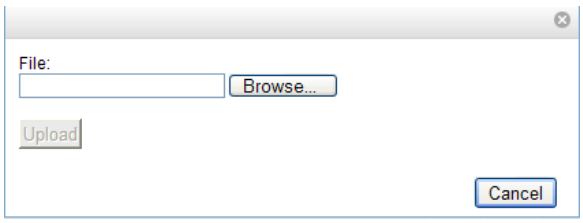
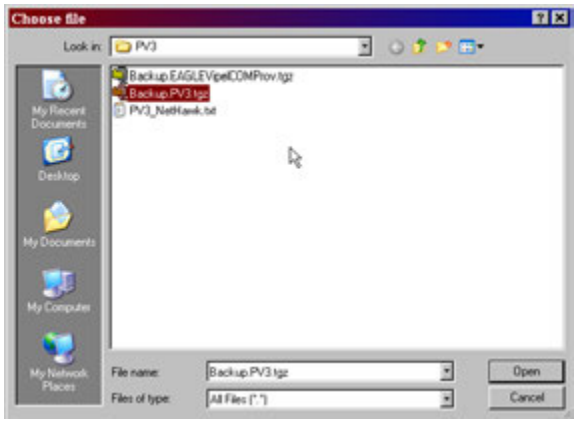
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

S T E P #	This procedure performs recovery if both NOAMP servers are failed and all SOAM servers are failed. This procedure also caters the C-Level Sever failure Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Gather Required Materials**	Gather the documents and required materials listed in **Section Required** Materials
2. ☐	**Recover the Failed Software**	Execute the following procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 2 :** Deploy Oracle Communications User Data Repository Virtual Machines
4. ☐	**Obtain Latest Database Backup and Network Configuration Data.**	Obtain the most recent database backup file from external backup sources (ex. file servers) or tape backup sources. From required materials list in **Section 3.1 Required Materials**; use site survey documents and Network Element report (if available), to determine network configuration data.
5. ☐	**Execute UDR Installation Procedure for the First NOAMP**	Configure the First NOAMP server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 3** "Configure NOAMP-A Server (1st NOAMP Only)" **Note:** If Topology or nodeId alarms are persistent after the database restore, refer to the steps below.

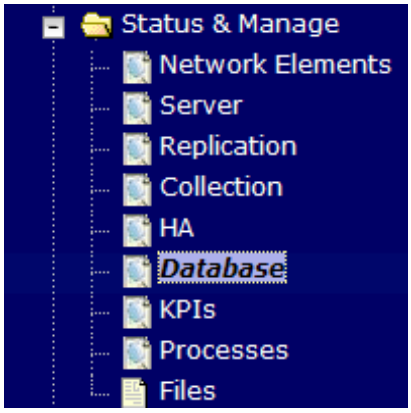
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

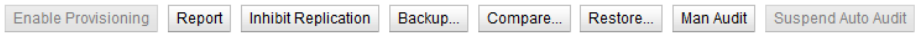
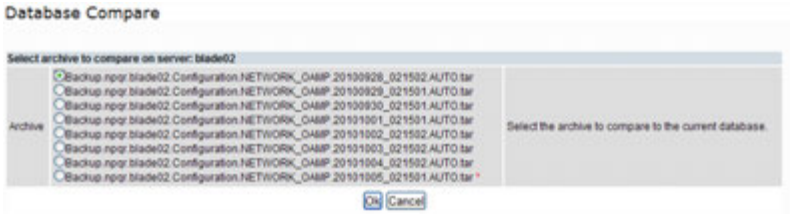
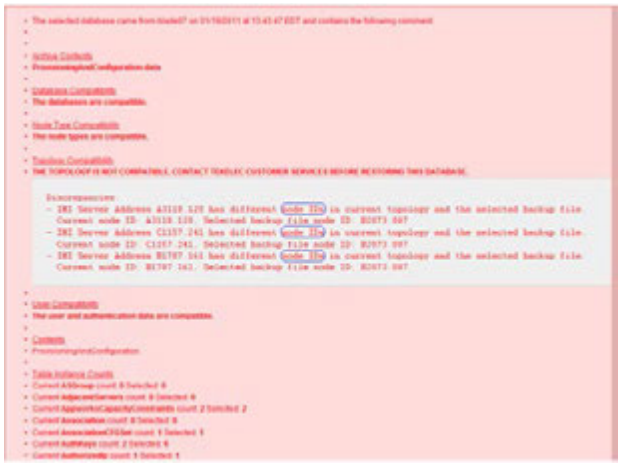
6. ☐	**Active NOAMP:** Login	Login to the NOAMP GUI as the ***guiadmin*** user:

Procedure 1: Recovery Scenario 1 -- Complete Server Outage

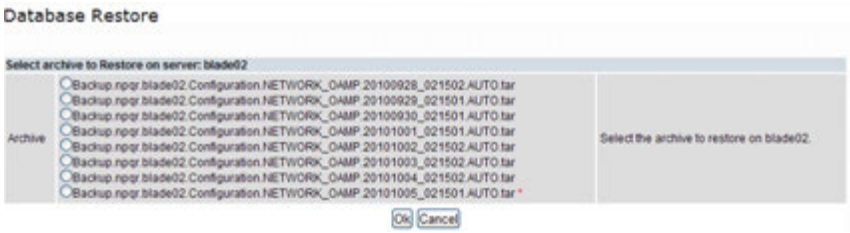
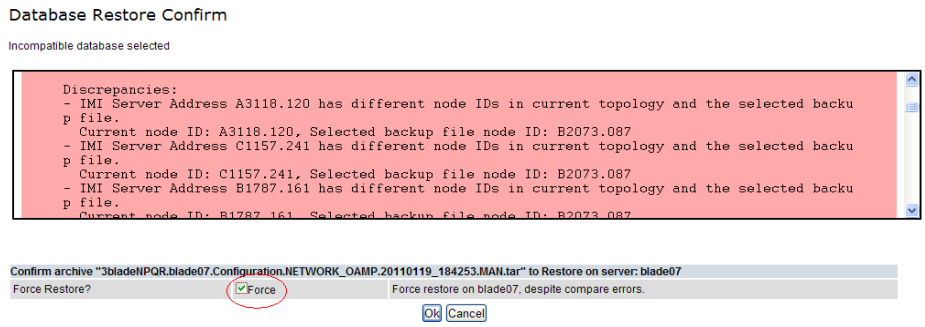
7. ☐	**Active NOAMP:** Upload the Backed up Database File	Browse to **Main Menu → Status & Manage → Files**  Select the Active NOAMP server. The following screen will appear:  Click on **Upload** as shown below and select the file *"NO Provisioning and Configuration:"* file backed up after initial installation and provisioning.  Click on **Browse** and locate the backup file and click on Open as shown below.   Click on the **Upload** button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete.

Procedure 1: Recovery Scenario 1 -- Complete Server Outage

8. ☐	**Active NOAMP:** Disable Provisioning	Click on **Main Menu → Status & Manage → Database**  Disable Provisioning by clicking on **Disable Provisioning** button at the bottom of the screen as shown below. A confirmation window will appear, press **OK** to disable Provisioning. The message *"Warning Code 002"* may appear.

9. ☐	**Active NOAMP:** Verify the Archive Contents and Database Compatibility	Select the **Active NOAMP** server and click on the **Compare**.  The following screen is displayed; click the button for the restored database file that was uploaded as a part of **Step 13** of this procedure.  **Verify** that the output window matches the screen below. **Note:** You will get a database mismatch regarding the NodeIDs of the VMs. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS).  **Note:** Archive Contents and Database Compatibilities must be the following: **Archive Contents:** Configuration data **Database Compatibility:** The databases are compatible. **Note:** The following is expected Output for Topology Compatibility Check since we are restoring from existing backed up data base to database with just one NOAMP: **Topology Compatibility** THE TOPOLOGY SHOULD BE COMPATIBLE MINUS THE NODEID. **Note:** We are trying to restore a backed up database onto an empty NOAMP database. This is an expected text in Topology Compatibility. If the verification is successful, Click **BACK** button and continue to **next step** in this procedure.

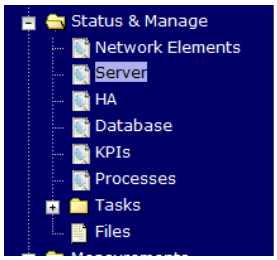
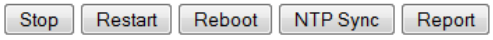
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

10. ☐	**Active NOAMP:** Restore the Database	Click on **Main Menu → Status & Manage → Database** Select the **Active NOAMP** server, and click on **Restore** as shown below. The following screen will be displayed. Select the proper back up provisioning and configuration file.  Click **OK** Button. The following confirmation screen will be displayed. **Note:** You will get a database mismatch regarding the NodeIDs of the servers. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS). Select the **Force** checkbox as shown above and Click **OK** to proceed with the DB restore.  **Note:** After the restore has started, the user will be logged out of XMI NO GUI since the restored Topology is old data.

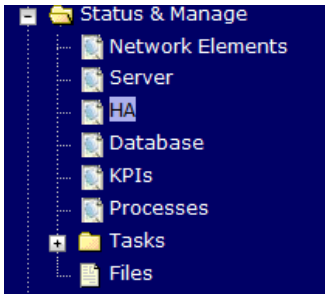
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

11. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:
12. ☐	**Active NOAMP:** Monitor and Confirm database restoral	Wait for **5-10 minutes** for the System to stabilize with the new topology: Monitor the Info tab for **"Success"**. This will indicate that the backup is complete and the system is stabilized. Following alarms **must** be ignored for NOAMP and MP Servers until all the Servers are configured: Alarms with Type Column as **"REPL"** , **"COLL", "HA"** (with mate NOAMP), **"DB"** (about Provisioning Manually Disabled) **Note:** Do not pay attention to alarms until all the servers in the system are completely restored. **Note:** The Configuration and Maintenance information will be in the same state it was backed up during initial backup.
13. ☐	**Active NOAMP:** Login	Login to the recovered Active NOAMP via SSH terminal as ***admusr*** user.

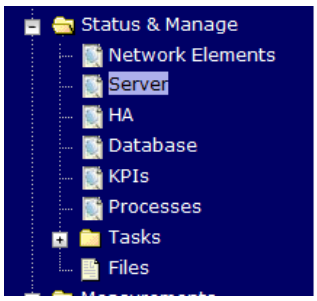
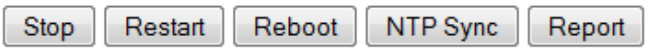
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

14. ☐	**Active NOAMP:** Restore /etc/hosts/ File of the Active NOAMP	Execute the following command: `$ sudo AppWorks AppWorks_AppWorks updateServerAliases <NOAMP Host Name>`
15. ☐	**Active NOAMP:** Recover Standby NOAMP **(HA Deployments Only)**	Configure the second NOAMP server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 22. **Procedure 10** "Apply Configuration for Remaining Servers" for second NOAMP. **Note:** If Topology or nodeId alarms are persistent after the database restore, refer to the steps below.
16. ☐	**Active NOAMP:** Restart UDR application on Recovered NOAMP	Navigate to **Main Menu → Status & Manage → Server**,  Select the recovered standby NOAMP server and click on **Restart**. 

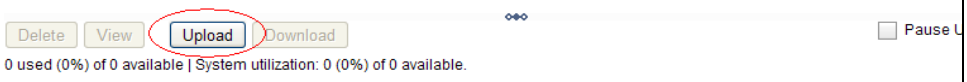
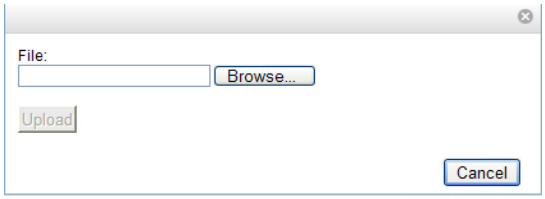
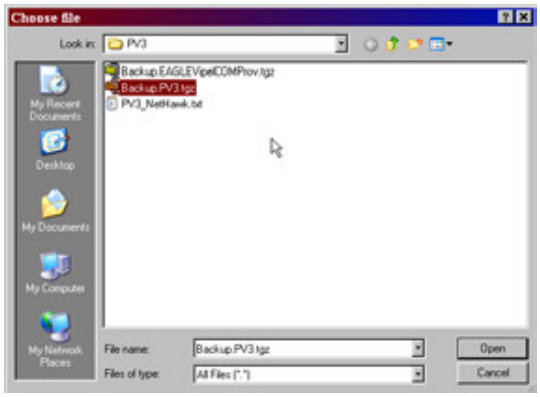
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

17. ☐	**Active NOAMP:** Set HA on Standby NOAMP	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen Select the standby NOAMP server, set it to **Active** Press **OK**
18. ☐	**Active NOAMP:** Stop Replication to the C-Level Servers of this Site.	Inhibit Replication to the working C Level (MP) Servers which belong to the **same site** as of the failed SOAM servers, as the recovery of Active SOAM will cause the database wipeout in the C level servers because of the replication Execute **Appendix B: Inhibit A and B Level Replication on C-Level Servers**
19. ☐	**Active NOAMP:** Recover SOAM Server	Recover the SOAM server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 22. **Procedure 10** "Apply Configuration for Remaining Servers" for SOAM

Procedure 1: Recovery Scenario 1 -- Complete Server Outage

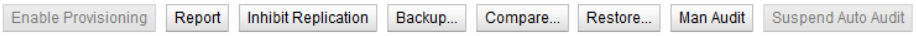
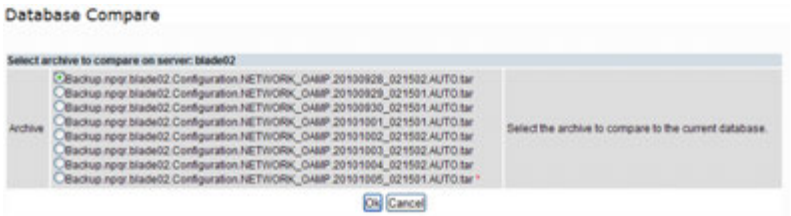
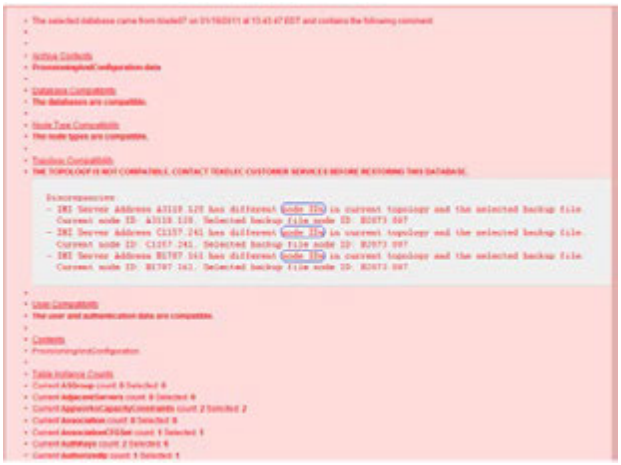
20. ☐	**Active NOAMP:** Restart UDR application on Recovered SOAM Server	Navigate to **Main Menu → Status & Manage → Server**,  Select the recovered server and click on **Restart**. 

Procedure 1: Recovery Scenario 1 -- Complete Server Outage

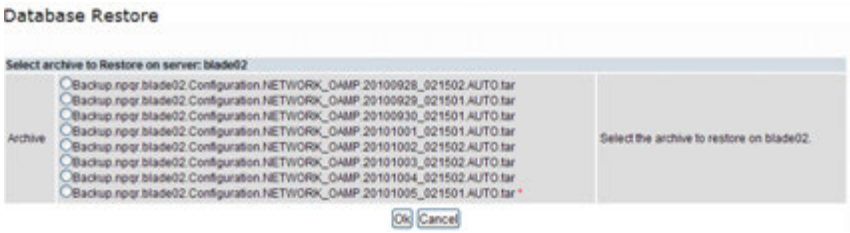
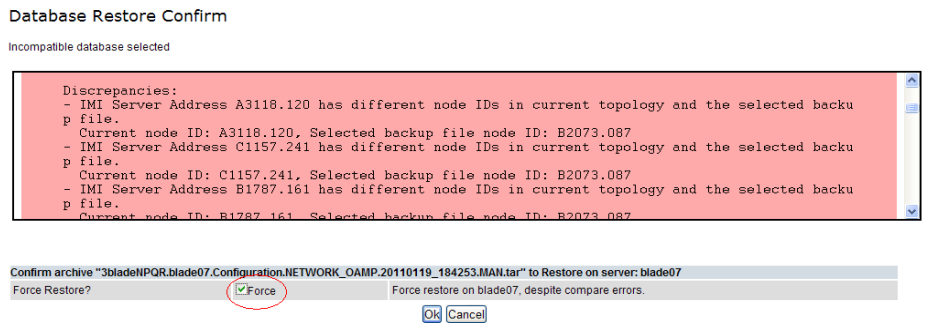
21. ☐	**Active NOAMP:** Upload the backed up SOAM Database file	Navigate to **Main Menu → Status & Manage → Files** Select the **Active SOAM server**. The following screen will appear. Click on Upload as shown below and select the file *"SO Provisioning and Configuration:"* file backed up after initial installation and provisioning.  Click on Browse and Locate the backup file and click on Open as shown below.   Click on the **Upload** button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete.

Procedure 1: Recovery Scenario 1 -- Complete Server Outage

22. ☐	**Recovered SOAM:** Login	Establish a GUI session on the recovered SOAM server. Open the web browser and enter a URL of: `http://<Recovered_SOAM_IP_Address>` Login as the ***guiadmin*** user:

23. ☐	**Recovered SOAM:** Verify the Archive Contents and Database Compatibility	Navigate to **Main Menu → Status & Manage → Database** Select the **Active SOAM** server and click on the **Compare**.  The following screen is displayed; click the button for the restored database file that was uploaded as a part of **Step 13** of this procedure.  **Verify** that the output window matches the screen below. **Note:** You will get a database mismatch regarding the NodeIDs of the VMs. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS).  **Note:** Archive Contents and Database Compatibilities must be the following: **Archive Contents:** Configuration data **Database Compatibility:** The databases are compatible. **Note:** The following is expected Output for Topology Compatibility Check since we are restoring from existing backed up data base to database with just one SOAM: **Topology Compatibility** THE TOPOLOGY SHOULD BE COMPATIBLE MINUS THE NODEID. **Note:** We are trying to restore a backed up database onto an empty SOAM database. This is an expected text in Topology Compatibility. If the verification is successful, Click **BACK** button and continue to **next step** in this procedure.

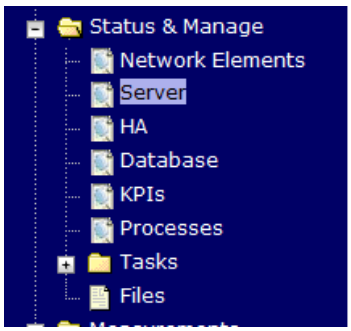
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

24. ☐	**Recovered SOAM:** Restore the Database	Click on **Main Menu → Status & Manage → Database** Select the **Active SOAM** server, and click on **Restore** as shown below. The following screen will be displayed. Select the proper back up provisioning and configuration file.  Click **OK** Button. The following confirmation screen will be displayed. If you get an error that the NodeIDs do not match. That is expected. If no other errors beside the NodeIDs are displayed, select the **Force** checkbox as shown below and Click **OK** to proceed with the DB restore.  **Note:** After the restore has started, the user will be logged out of XMI SOAM GUI since the restored Topology is old data.

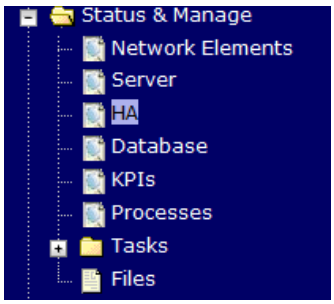
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

25. ☐	**Recovered SOAM**: Monitor and Confirm database restoral	Wait for **5-10 minutes** for the System to stabilize with the new topology: Monitor the Info tab for **"Success"**. This will indicate that the backup is complete and the system is stabilized. **Note:** Do not pay attention to alarms until all the servers in the system are completely restored. **Note:** The Configuration and Maintenance information will be in the same state it was backed up during initial backup.
26. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

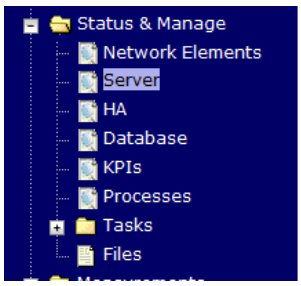
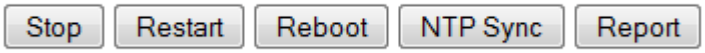
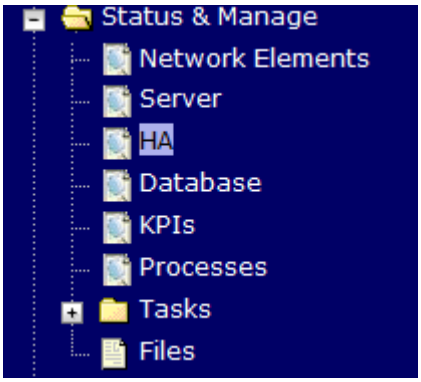
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

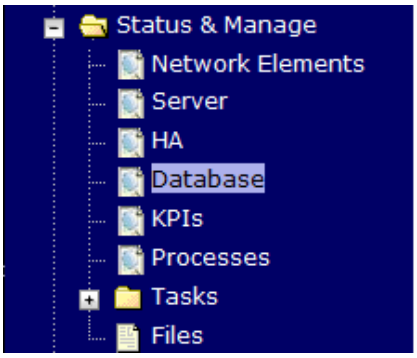
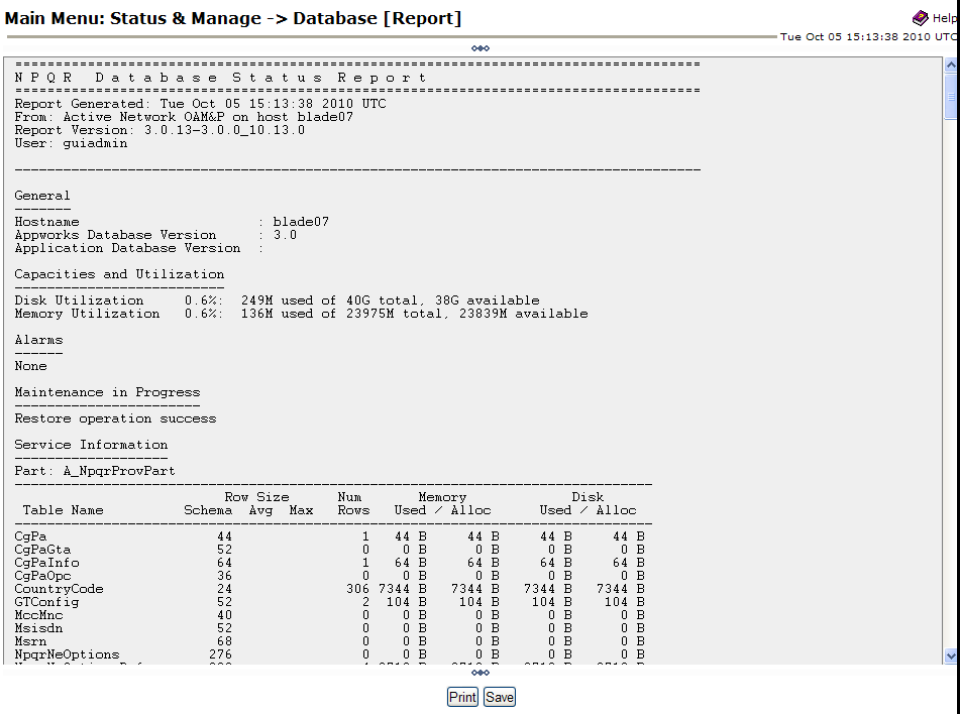
27. ☐	**Active NOAMP:** Recover remaining SOAM **(HA Deployments Only)**	**NOTE:** For Non-HA sites **SKIP** this step. Recover second SOAM server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 22. **Procedure 10** "Apply Configuration for Remaining Servers" for remaining SOAM. **NOTE:** Wait for server to reboot before continuing.
28.	**Active NOAMP:** Restart UDR application on remaining SOAM **(HA Deployments Only)**	**NOTE:** For Non-HA sites **SKIP** this step. Navigate to **Main Menu → Status & Manage → Server**,  Select the recovered server and click on **Restart**. Stop Restart Reboot NTP Sync Report

Procedure 1: Recovery Scenario 1 -- Complete Server Outage

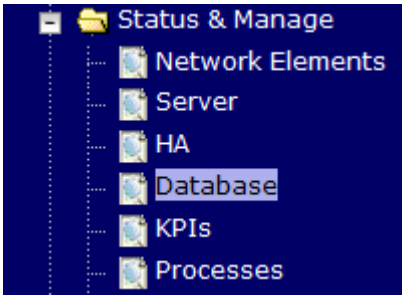
29. ☐	**Active NOAMP:** Set HA on Recovered SOAM **(HA Deployments Only)**	**NOTE:** For Non-HA sites **SKIP** this step. Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen Set Max Allowed HA Role to **Active** Press **OK**
30. ☐	**Active NOAMP:** Start Replication on MP Servers	Un-Inhibit *(Start)* Replication to the **MP** Servers which belong to the same site as of the failed SOAM servers. Execute **Appendix C Un-Inhibit A and B Level Replication on C-Level Servers** Navigate to **Main Menu → Status & Manage → Database** If the *"Repl Status"* is set to "Inhibited", click on the **Allow Replication** button as shown below using the following order, otherwise if none of the servers are inhibited, skip this step and continue with the next step: • Active NOAMP Server • Standby NOAMP Server • Active SOAM Server • Standby SOAM Server • MP Servers Verify that the replication on all the working servers is allowed. This can be done by clicking on each server and checking that the button below shows "Inhibit Replication", and **NOT** "Allow Replication".

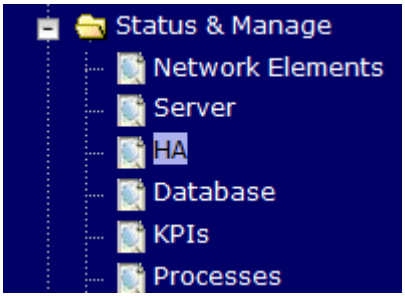
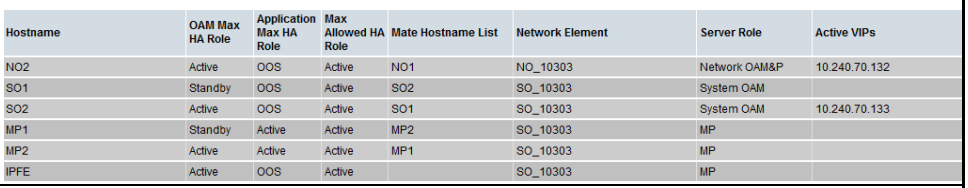
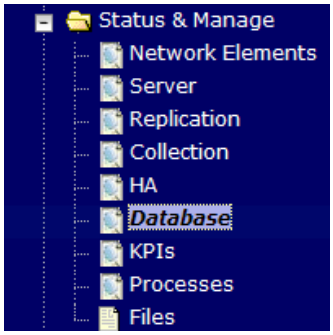
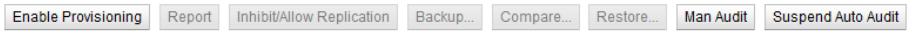
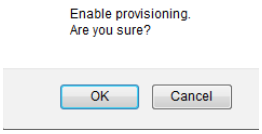
Procedure 1: Recovery Scenario 1 -- Complete Server Outage

31. ☐	**Active NOAMP:** Restart UDR application for Recovered MP	Navigate to **Main Menu → Status & Manage → Server**,  Select the recovered server and click on **Restart**. 
32. ☐	**Active NOAMP:** Set HA on all MP Servers	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
33. ☐	**Active NOAMP:** Perform key exchange between the active-NOAMP and recovered servers.	Establish an SSH session to the Active NOAMP, login as ***admusr.*** Execute the following command to perform a keyexchange from the active NOAMP to each recovered server: `$ keyexchange admusr@<Recovered Server Hostname>`

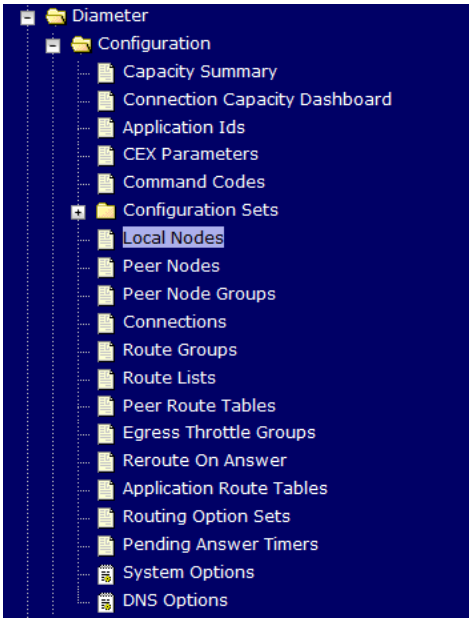
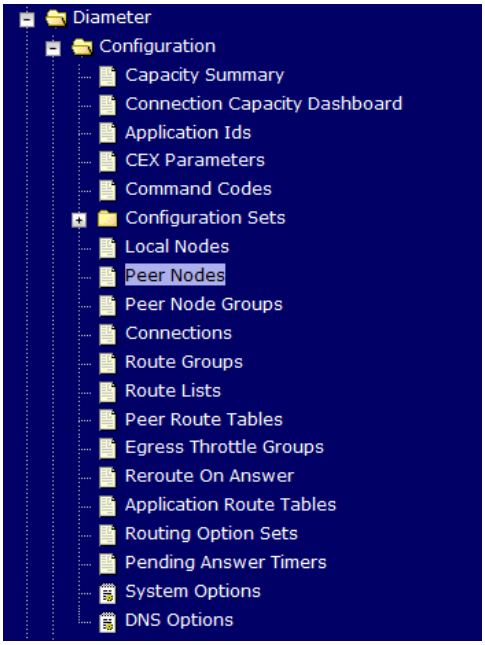
34. ☐	**Active NOAMP:** Fetch and Store the database Report for the Newly Restored Data and Save it	Navigate to **Main Menu → Status & Manage → Database**  Select the **active** NOAMP server and click on the **Report** button at the bottom of the page. The following screen is displayed:  Click on **Save** and save the report to your local machine.

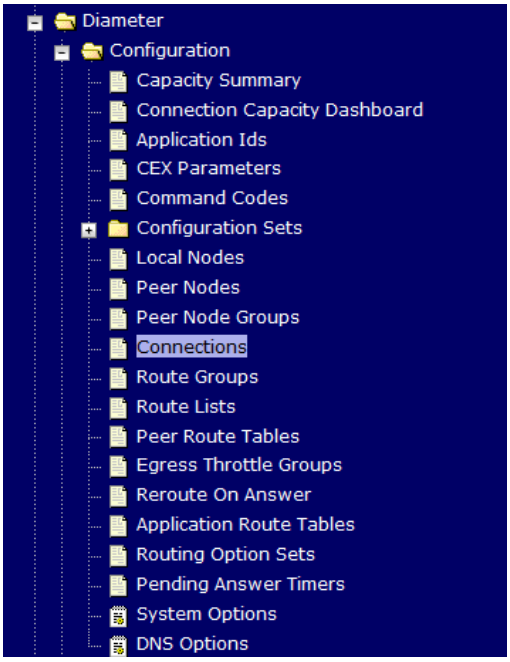
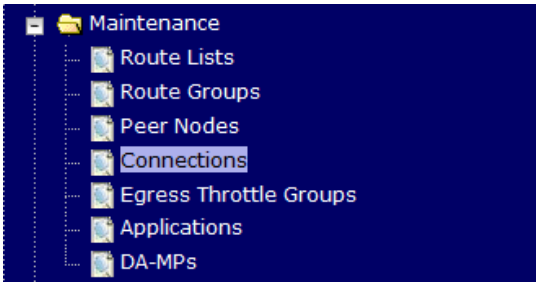
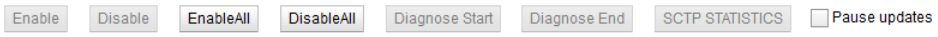
35. ☐	**Active NOAMP:** Verify Replication Between Servers	Login to the Active NOAMP via SSH terminal as ***admusr*** user.
		Execute the following command:
		$ sudo irepstat –m
		Output like below shall be generated:
		`-- Policy 0 ActStb [DbReplication] ----------`
		`RDU06-MP1 -- Stby`
		`BC From RDU06-SO1 Active 0 0.50 ^0.17%cpu 42B/s A=none`
		`CC From RDU06-MP2 Active 0 0.10 ^0.17 0.88%cpu 32B/s A=none`
		`RDU06-MP2 -- Active`
		`BC From RDU06-SO1 Active 0 0.50 ^0.10%cpu 33B/s A=none`
		`CC To RDU06-MP1 Active 0 0.10 0.08%cpu 20B/s A=none`
		`RDU06-NO1 -- Active`
		`AB To RDU06-SO1 Active 0 0.50 1%R 0.03%cpu 21B/s`
		`RDU06-SO1 -- Active`
		`AB From RDU06-NO1 Active 0 0.50 ^0.04%cpu 24B/s`
		`BC To RDU06-MP1 Active 0 0.50 1%R 0.04%cpu 21B/s`
		`BC To RDU06-MP2 Active 0 0.50 1%R 0.07%cpu 21B/s`

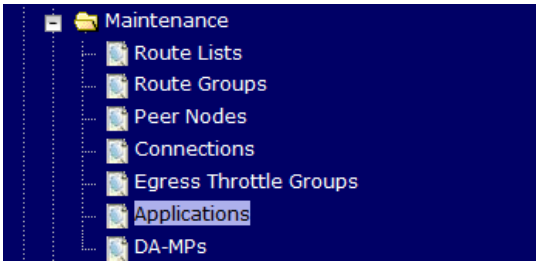
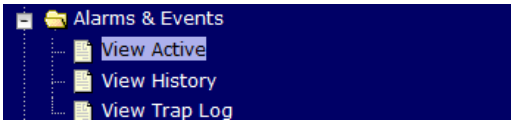
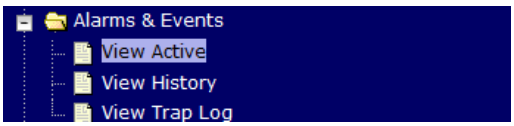
36. ☐	**Active NOAMP:** Verify the Database states	Click on **Main Menu → Status and Manager → Database**  Verify that the "OAM Max HA Role" is either "Active" or "Standby" for NOAMP and SOAM and "Application Max HA Role" for MPs is "Active", and that the status is "Normal" as shown below: Network Element | Server | Role | OAM Max HA Role | Application Max HA Role | Status | DB Level | OAM Repl Status | SIG Repl Status | Repl Status | Repl Audit Status NO_10303 | NO2 | Network OAM&P | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | PSBR | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | MP2 | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO1 | System OAM | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg NO_10303 | NO1 | Network OAM&P | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | IPFE | MP | Active | OOS | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO2 | System OAM | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg

37. ☐	**Active NOAMP:** Verify the HA Status	Click on **Main Menu → Status and Manage → HA**  Select the row for all of the servers Verify that the "HA Role" is either "Active" or "Standby". 
38.	**Active NOAMP:** Enable Provisioning	Click on **Main Menu → Status & Manage → Database**  Enable Provisioning by clicking on **Enable Provisioning** button at the bottom of the screen as shown below.  A confirmation window will appear, press **OK** to enable Provisioning. 

Hostname	OAM Max HA Role	Application Max HA Role	Max Allowed HA Role	Mate Hostname List	Network Element	Server Role	Active VIPs
NO2	Active	OOS	Active	NO1	NO_10303	Network OAM&P	10.240.70.132
SO1	Standby	OOS	Active	SO2	SO_10303	System OAM	
SO2	Active	OOS	Active	SO1	SO_10303	System OAM	10.240.70.133
MP1	Standby	Active	Active	MP2	SO_10303	MP	
MP2	Active	Active	Active	MP1	SO_10303	MP	
IPFE	Active	OOS	Active		SO_10303	MP	

39. ☐	**Active SOAM:** Verify the Local Node Info	Navigate to **Main Menu → Diameter → Configuration → Local Node**  Verify that all the local nodes are shown.
40. ☐	**Active SOAM:** Verify the Peer Node Info	Navigate to **Main Menu → Diameter → Configuration → Peer Node**  Verify that all the peer nodes are shown.

41. ☐	**Active SOAM:** Verify the Connections Info	Navigate to **Main Menu → Diameter → Configuration → Connections**  Verify that all the connections are shown.
42. ☐	**Active SOAM:** Enable Connections if needed	Navigate to **Main Menu → Diameter → Maintenance → Connections**  Select each connection and click on the **Enable** button. Alternatively you can enable all the connections by selecting the **EnableAll** button.  Verify that the Operational State is Available.

43. ☐	**Active SOAM:** Enable SPR Features	Navigate to **Main Menu → Diameter → Maintenance → Applications**  Select the feature application. Click the **Enable** button.
44. ☐	**Active SOAM:** Examine All Alarms	Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
45. ☐	**Active NOAMP:** Examine All Alarms	Login to the NOAMP VIP if not already logged in. Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
46. ☐	**Restore GUI Usernames and Passwords**	If applicable, Execute steps in **Section 5** to recover the user and group information restored.
47. ☐	**Backup and Archive All the Databases from the Recovered System**	Execute **Appendix A Oracle Communications User** Data Repository Database Backup to back up the Configuration databases.
THIS PROCEDURE HAS BEEN COMPLETED		

4.1.2 Recovery Scenario 2 (Partial Server Outage with one NOAMP server intact and both SOAMs failed)

For a partial server outage with an NOAMP server intact and available; SOAM servers are recovered using recovery procedures for software and then executing a database restore to the active SOAM server using a database backup file obtained from the SOAM servers. All other servers are recovered using recovery procedures for software. Database replication from the active NOAMP server will recover the database on these servers. The major activities are summarized in the list below. Use this list to understand the recovery procedure summary. Do not use this list to execute the procedure. The actual procedures' detailed steps are in **Procedure 2**. The major activities are summarized as follows:

Recover **Standby NOAMP** server *(if needed)* by recovering software and the database.

- Recover the software.

Recover **Active SOAM** server by recovering software.

- Recover the software.
- Recover the Database.

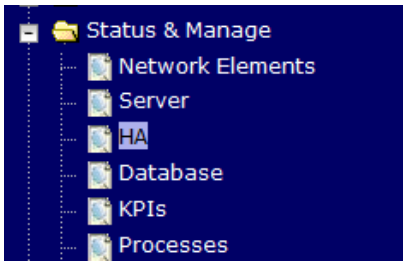
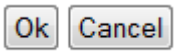
Recover any failed **SOAM and MP** servers by recovering software.

- Recover the software.
- The database has already been restored at the active SOAM server and does not require restoration at the SO and MP servers.

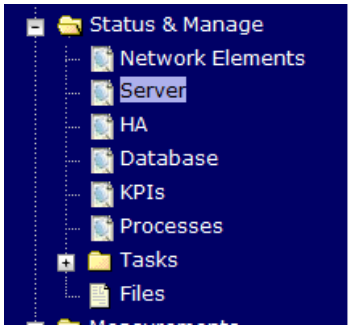
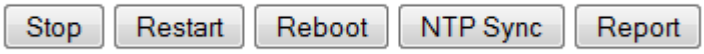
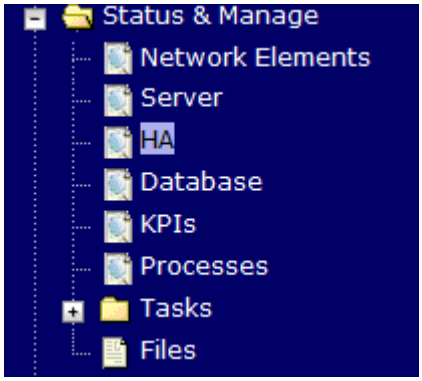
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

S T E P #	This procedure performs recovery if at least 1 NOAMP server is available but all SOAM servers in a site have failed. This includes any SOAM server that is in another location. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Gather Required Materials**	Gather the documents and required materials listed in **Section Required** Materials
2. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

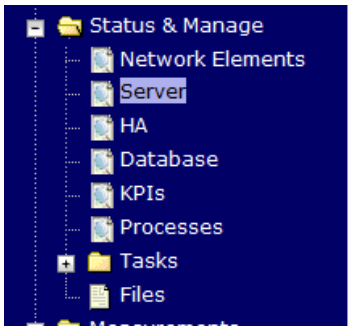
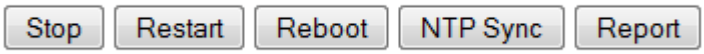
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

3. ☐	**Active NOAMP:** Set Failed Servers to Standby	Navigate to **Main Menu → Status & Manage → HA**  Select **Edit** Set the Max Allowed HA Role drop down box to **Standby** for the failed servers. Select **Ok** 
4. ☐	**Create VMs** **Recover the Failed Software**	Execute the following procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 2 :** Deploy Oracle Communications User Data Repository Virtual Machines on VMware
5. ☐	**Repeat for Remaining Failed Servers**	If necessary, repeat **step 5** for all remaining failed servers.
6. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

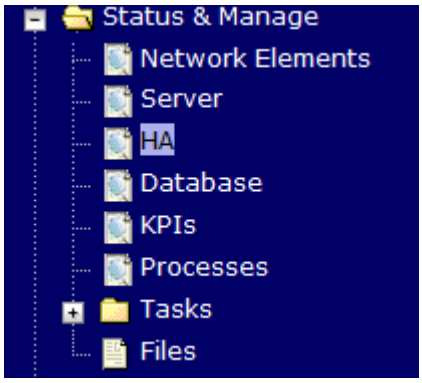
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

7. ☐	**Active NOAMP:** Recover Standby NOAMP	Configure the standby NOAMP server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 22. **Procedure 10** "Apply Configuration for Remaining Servers" for NOAMP. **Note:** If Topology or nodeId alarms are persistent after the database restore, refer to the steps below.
8. ☐	**Active NOAMP:** Restart UDR application on Recovered NOAMP	Navigate to **Main Menu → Status & Manage → Server**,  Select the recovered standby NOAMP server and click on **Restart**. 
9. ☐	**Active NOAMP:** Set HA on Recovered NOAMP	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen Select the standby NOAMP server, set it to **Active** Press **OK**

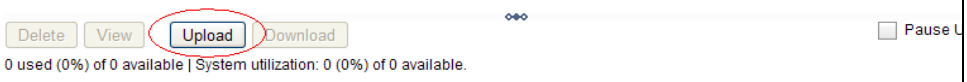
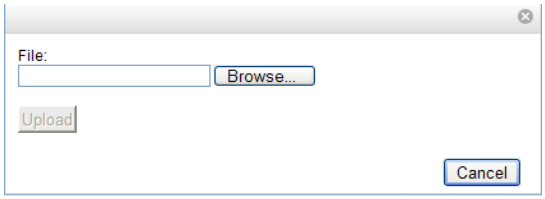
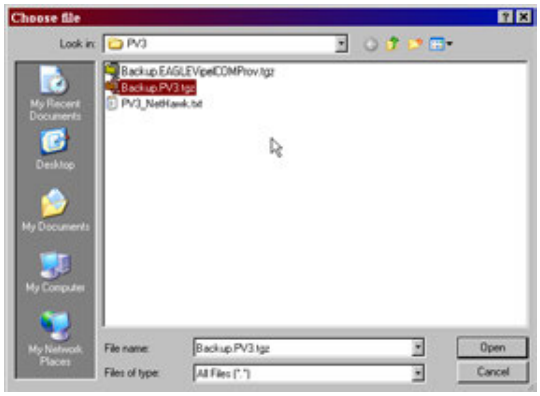
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

10. ☐	**Active NOAMP:** Stop Replication to the MP Servers of this Site.	Inhibit Replication to the working C Level Servers which belong to the **same site** as the failed SOAM servers, as the recovery of Active SOAM will cause the database wipeout in the C level servers because of the replication Execute **Appendix B Inhibit A and B Level Replication on C-Level Servers**
11. ☐	**Active NOAMP:** Recover SOAM Server	Recovery the SOAM server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 22. **Procedure 10** "Apply Configuration for Remaining Servers" for SOAM
12. ☐	**Active NOAMP:** Restart UDR application on Recovered SOAM	Navigate to **Main Menu → Status & Manage → Server**  Select the recovered SOAM server and click on **Restart**. 

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

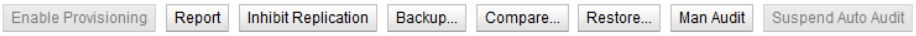
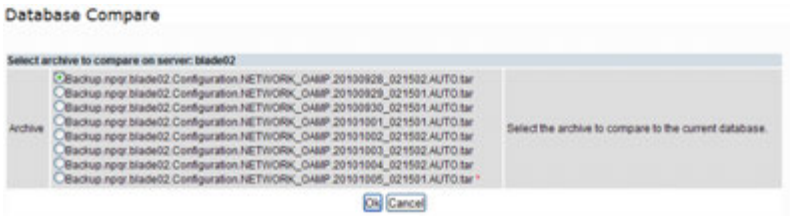
13. ☐	**Active NOAMP:** Set HA on Recovered SOAM	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen Select the SOAM server, set it to **Active** Press **OK**

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

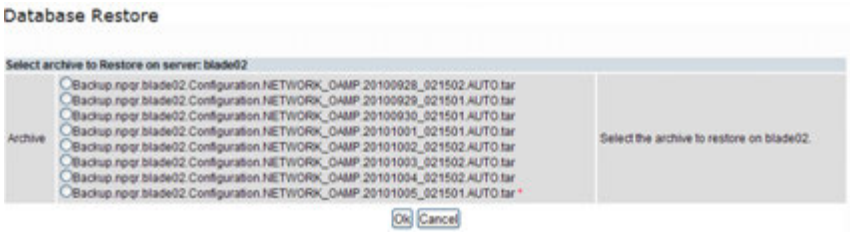
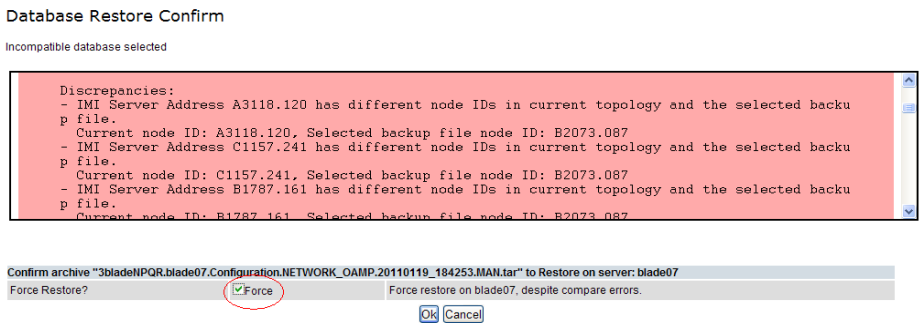
14. ☐	**Active NOAMP:** Upload the backed up SOAM Database file	Navigate to **Main Menu → Status & Manage → Files** Select the Active SOAM server. The following screen will appear. Click on Upload as shown below and select the file *"SO Provisioning and Configuration:"* file backed up after initial installation and provisioning.  Click on **Browse** and Locate the backup file and click on **Open** as shown below.   Click on the **Upload** button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete.

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

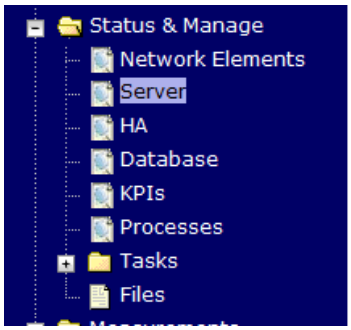
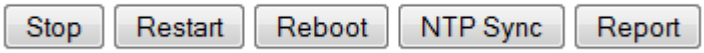
15. ☐	**Recovered SOAM:** Login	Establish a GUI session on the recovered SOAM server. Open the web browser and enter a URL of: `http://<Recovered_SOAM_IP_Address>` Login as the ***guiadmin*** user:

16. ☐	**Recovered SOAM:** Verify the Archive Contents and Database Compatibility	Navigate to **Main Menu → Status & Manage → Database** Select the **Active SOAM** server and click on the **Compare**.  The following screen is displayed; click the button for the restored database file that was uploaded as a part of this procedure.  **Verify** that the output window matches the screen below. **Note:** You will get a database mismatch regarding the NodeIDs of the VMs. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS) **Note:** Archive Contents and Database Compatibilities must be the following: **Archive Contents:** Configuration data **Database Compatibility:** The databases are compatible. **Note:** The following is expected Output for Topology Compatibility Check since we are restoring from existing backed up data base to database with just one SOAM: **Topology Compatibility** THE TOPOLOGY SHOULD BE COMPATIBLE MINUS THE NODEID. **Note:** We are trying to restore a backed up database onto an empty SOAM database. This is an expected text in Topology Compatibility. If the verification is successful, Click **BACK** button and continue to **next step** in this procedure.

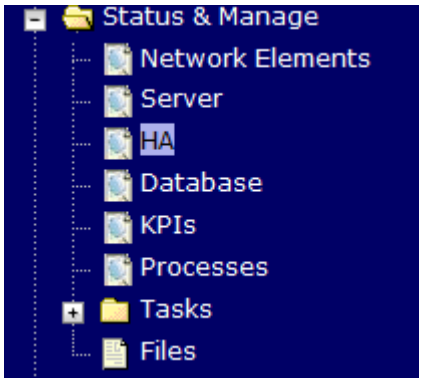
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

17. ☐	**Recovered SOAM:** Restore the Database	Click on **Main Menu → Status & Manage → Database** Select the **Active SOAM** server, and click on **Restore** as shown below. The following screen will be displayed. Select the proper back up provisioning and configuration file.  Click **OK** Button. The following confirmation screen will be displayed. **Note:** You will get a database mismatch regarding the NodeIDs of the servers. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS). Select the **Force** checkbox as shown above and Click **OK** to proceed with the DB restore.  **Note:** After the restore has started, the user will be logged out of XMI SOAM GUI since the restored Topology is old data.

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

18. ☐	**Recovered SOAM**: Monitor and Confirm database restoral	Wait for **5-10 minutes** for the System to stabilize with the new topology: Monitor the Info tab for **"Success"**. This will indicate that the backup is complete and the system is stabilized. **Note:** Do not pay attention to alarms until all the servers in the system are completely restored. **Note:** The Configuration and Maintenance information will be in the same state it was backed up during initial backup.
19. ☐	**Active NOAMP:** Recover remaining SOAM Server **(HA Deployments Only)**	**NOTE:** For **Non-HA** sites **SKIP** this step Configure the remaining SOAM server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 22. **Procedure 10** "Apply Configuration for Remaining Servers" for second SOAM. **NOTE:** Wait for server to reboot before continuing.
20. ☐	**Active NOAMP:** Restart UDR application on Recovered SOAM **(HA Deployments Only)**	Navigate to **Main Menu → Status & Manage → Server**  Select the recovered SOAM server and click on **Restart**. 

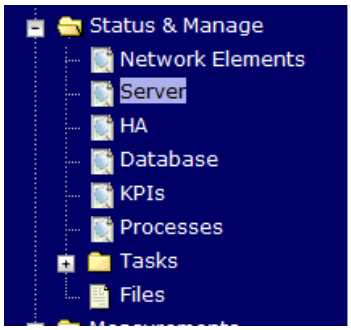
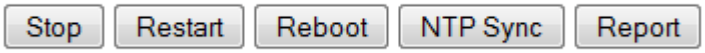
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

21. ☐	**Active NOAMP:** Set HA on SOAM Servers **(HA Deployments Only)**	**NOTE:** For **Non-HA** sites **SKIP** this step Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each SOAM server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
22. ☐	**Recovered Servers:** Login	Establish an SSH to the recovered server's XMI address:

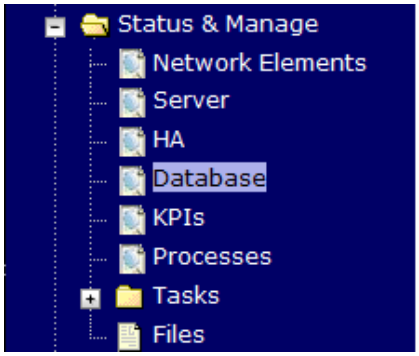
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

23. ☐	**Recovered Servers:** Sync NTP	1) Perform the following to retrieve the remote NTP server:
		
		`$ sudo ntpq –np`
		
		Example output:
		
		`[admusr@NOAMP-2 ~]$ ntpq -np`
		`remote refid st t when poll reach delay offset jitter`
		`==============================================================================`
		`*10.240.9.186 10.250.33.2 3 u 356 1024 377 1.409 0.113 2.434`
		
		2) Stop ntpd service:
		
		`$ sudo service ntpd stop`
		
		3) Sync the date to the ntp remote server:
		
		`$ sudo ntpdate <NTP remote server>`
		
		Note: The remote server below will be that of the one gathered in sub step 1.
		
		4) Start the ntp service:
		
		`$ sudo service ntpd start`

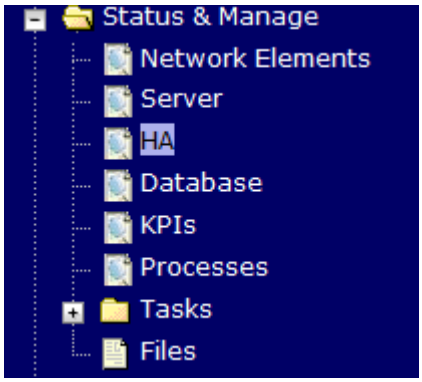
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

24. ☐	**Active NOAMP:** Restart UDR application on Recovered servers **(HA Deployments Only)**	**NOTE:** For **Non-HA** sites **SKIP** this step Navigate to **Main Menu → Status & Manage → Server**,  Select the recovered server and click on **Restart**. 
25. ☐	**Active NOAMP:** Start Replication on MP Servers	Un-Inhibit *(Start)* Replication to the **MP** Servers which belong to the same site as of the failed SOAM servers. Execute **Appendix C Un-Inhibit A and B Level Replication on C-Level Servers** Navigate to **Main Menu → Status & Manage → Database** If the *"Repl Status"* is set to "Inhibited", click on the **Allow Replication** button as shown below using the following order, otherwise if none of the servers are inhibited, skip this step and continue with the next step: • Active NOAMP Server • Standby NOAMP Server • Active SOAM Server • Standby SOAM Server • MP Servers Verify that the replication on all the working servers is allowed. This can be done by clicking on each server and checking that the button below shows "Inhibit Replication", and **NOT** "Allow Replication".

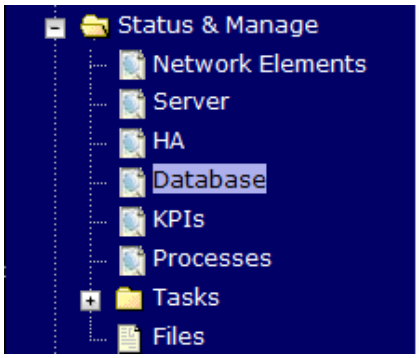
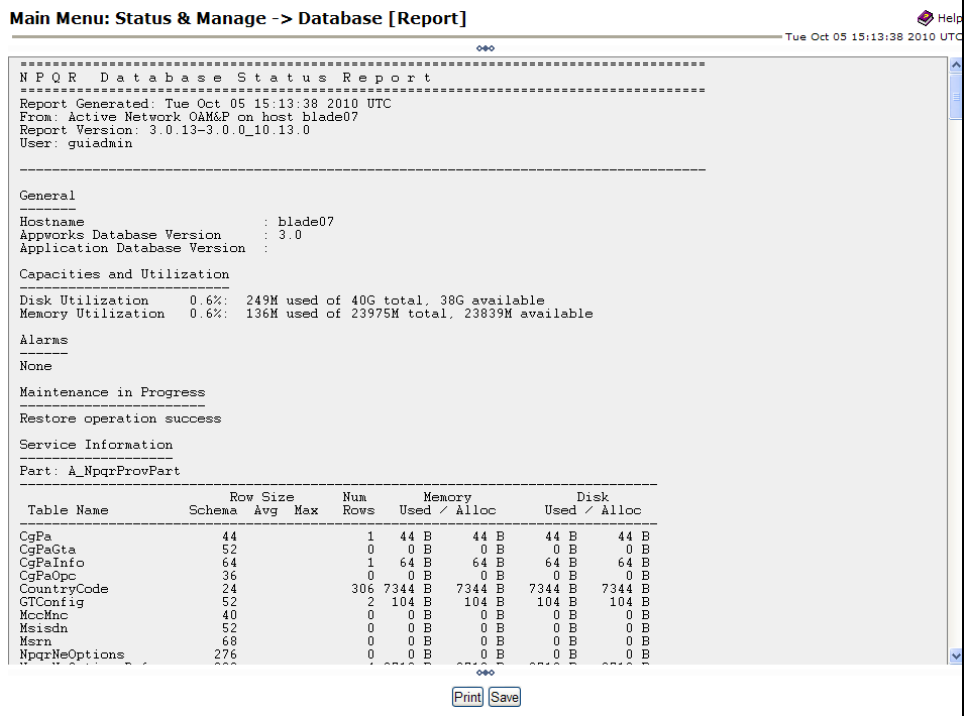
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

26. ☐	**Active NOAMP:** Start replication on ALL Servers	Un-Inhibit *(Start)* Replication to the **ALL** C-Level (MP) Servers Navigate to **Status & Manage → Database**  If the *"Repl Status"* is set to "Inhibited", click on the Allow Replication button as shown below using the following order: • Active NOAMPP Server • Standby NOAMPP Server • Active SOAM Server • Standby SOAM Server • MP Servers Verify that the replication on all servers is allowed. This can be done by clicking on each server and checking that the button below shows "Inhibit Replication", and **NOT** "Allow Replication".

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

27. ☐	**Active NOAMP:** Set HA on all MP Servers	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
28. ☐	**Active NOAMP:** Perform key exchange between the active-NOAMP and recovered servers.	Establish an SSH session to the Active NOAMP, login as ***admusr.*** Execute the following command to perform a keyexchange from the active NOAMP to each recovered server: `$ keyexchange admusr@<Recovered Server Hostname>` **Note:** If an export server is configured, perform this step.

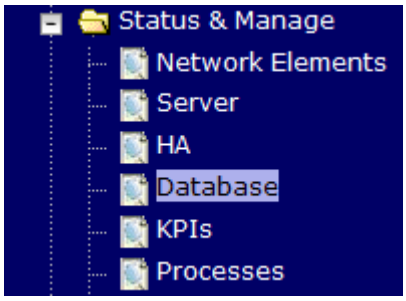
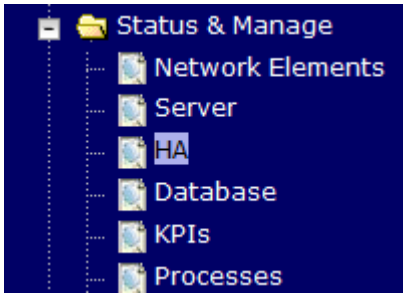
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

29. ☐	**Active NOAMP:** Fetch and Store the database Report for the Newly Restored Data and Save it	Navigate to **Main Menu → Status & Manage → Database**  Select the **active** NOAMP server and click on the **Report** button at the bottom of the page. The following screen is displayed:  Click on **Save** and save the report to your local machine.

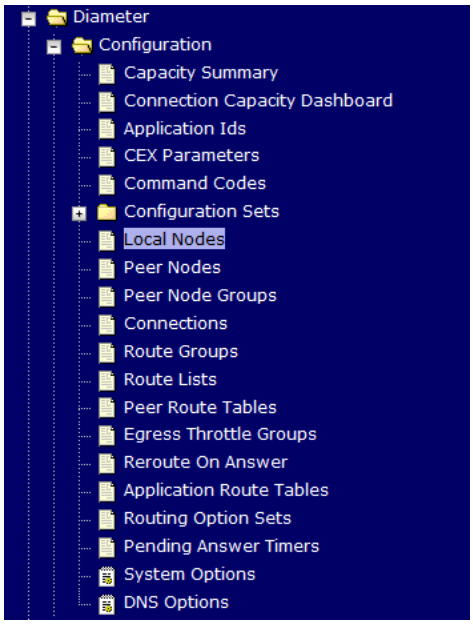
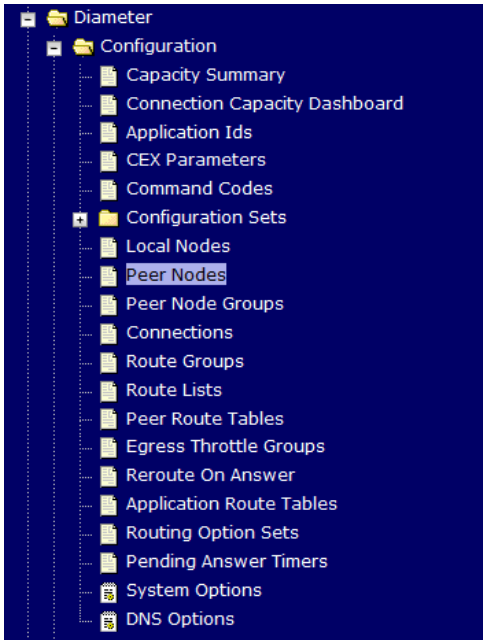
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

30. ☐	**Active NOAMP:**
	Verify Replication Between Servers.
		Login to the Active NOAMP via SSH terminal as ***admusr*** user.
		Execute the following command:
		$ sudo irepstat –m
		Output like below shall be generated:
		`-- Policy 0 ActStb [DbReplication] ----------`
		`RDU06-MP1 -- Stby`
		`  BC From RDU06-SO1 Active  0  0.50 ^0.17%cpu 42B/s  A=none`
		`  CC From RDU06-MP2 Active  0  0.10 ^0.17 0.88%cpu 32B/s  A=none`
		`RDU06-MP2 -- Active`
		`  BC From RDU06-SO1 Active  0  0.50 ^0.10%cpu 33B/s  A=none`
		`  CC To  RDU06-MP1 Active  0  0.10  0.08%cpu 20B/s  A=none`
		`RDU06-NO1 -- Active`
		`  AB To  RDU06-SO1 Active  0  0.50 1%R 0.03%cpu 21B/s`
		`RDU06-SO1 -- Active`
		`  AB From RDU06-NO1 Active  0  0.50 ^0.04%cpu 24B/s`
		`  BC To  RDU06-MP1 Active  0  0.50 1%R 0.04%cpu 21B/s`
		`  BC To  RDU06-MP2 Active  0  0.50 1%R 0.07%cpu 21B/s`

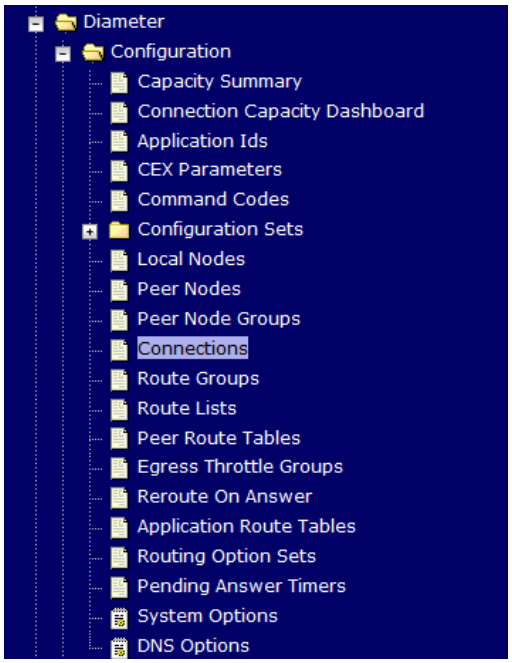
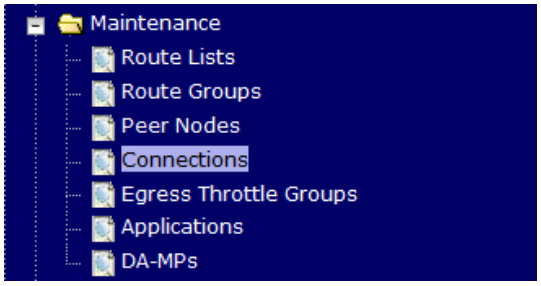
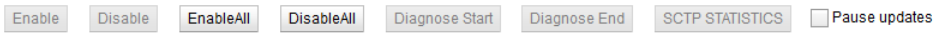
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

31. ☐	**Active NOAMP:** Verify the Database states	Click on **Main Menu → Status and Manager → Database**  Verify that the "OAM Max HA Role" is either "Active" or "Standby" for NOAMP and SOAM and "Application Max HA Role" for MPs is "Active", and that the status is "Normal" as shown below: Network Element | Server | Role | OAM Max HA Role | Application Max HA Role | Status | DB Level | OAM Repl Status | SIG Repl Status | Repl Status | Repl Audit Status NO_10303 | NO2 | Network OAM&P | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | PSBR | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | MP2 | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO1 | System OAM | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg NO_10303 | NO1 | Network OAM&P | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | IPFE | MP | Active | OOS | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO2 | System OAM | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg
32. ☐	**Active NOAMP:** Verify the HA Status	Click on **Main Menu → Status and Manage → HA**  Select the row for all of the servers Verify that the "HA Role" is either "Active" or "Standby". Hostname | OAM Max HA Role | Application Max HA Role | Max Allowed HA Role | Mate Hostname List | Network Element | Server Role | Active VIPs NO2 | Active | OOS | Active | NO1 | NO_10303 | Network OAM&P | 10.240.70.132 SO1 | Standby | OOS | Active | SO2 | SO_10303 | System OAM | SO2 | Active | OOS | Active | SO1 | SO_10303 | System OAM | 10.240.70.133 MP1 | Standby | Active | Active | MP2 | SO_10303 | MP | MP2 | Active | Active | Active | MP1 | SO_10303 | MP | IPFE | Active | OOS | Active | | SO_10303 | MP |

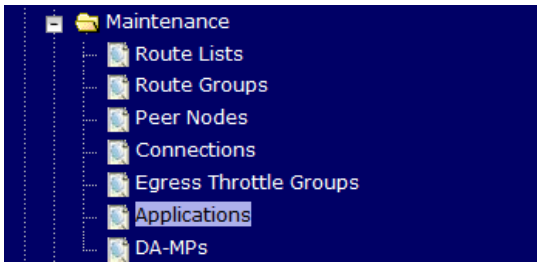
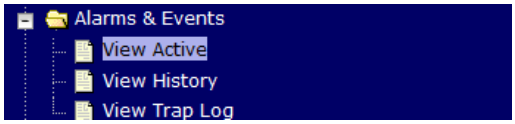
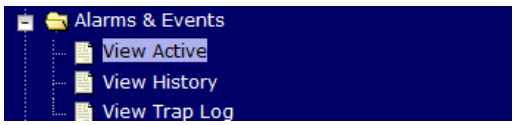
Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

33. ☐	**Active SOAM:** Verify the Local Node Info	Navigate to **Main Menu → Diameter → Configuration → Local Node**  Verify that all the local nodes are shown.
34. ☐	**Active SOAM:** Verify the Peer Node Info	Navigate to **Main Menu → Diameter → Configuration → Peer Node**  Verify that all the peer nodes are shown.

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

35. ☐	**Active SOAM:** Verify the Connections Info	Navigate to **Main Menu → Diameter → Configuration → Connections**  Verify that all the connections are shown.
36. ☐	**Active SOAM:** Enable Connections if needed	Navigate to **Main Menu → Diameter → Maintenance → Connections**  Select each connection and click on the **Enable** button. Alternatively you can enable all the connections by selecting the **EnableAll** button.  Verify that the Operational State is Available.

Procedure 2: Recovery Scenario 2 – Partial Outage One NOAMP Intact

37. ☐	**Active SOAM:** Enable SPR Features	Navigate to **Main Menu → Diameter → Maintenance → Applications**  Select the feature application Click the **Enable** button.
38. ☐	**Active SOAM:** Examine All Alarms	Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
39. ☐	**Active NOAMP:** Examine All Alarms	Login to the NOAMP VIP if not already logged in. Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
40. ☐	**Backup and Archive All the Databases from the Recovered System**	Execute **Appendix A Oracle Communications User** Data Repository Database Backup to back up the Configuration database.
THIS PROCEDURE HAS BEEN COMPLETED		

4.1.3 Recovery Scenario 3 (Partial Server Outage with all NOAMP servers failed and one SOAM server intact)

For a partial server outage with an SOAM server intact and available; NOAMP servers are recovered using recovery procedures for software and then executing a database restore to the active NOAMP server using a NOAMP database backup file obtained from external backup sources such as customer servers. All other servers are recovered using recovery procedures for software. Database replication from the active NOAMP/active SOAM server will recover the database on these servers. The major activities are summarized in the list below. Use this list to understand the recovery procedure summary. Do not use this list to execute the procedure. The actual procedures' detailed steps are in **Procedure 3**. The major activities are summarized as follows:

Recover **Active NOAMP** server by recovering software and the database.

- Recover the software.
- Recover the database

Recover **Standby NOAMP servers** by recovering software.

- Recover the software.

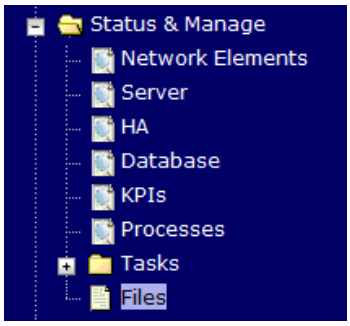
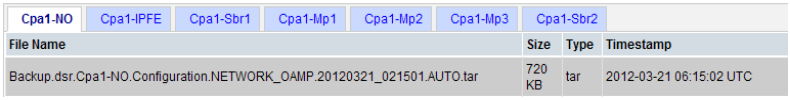
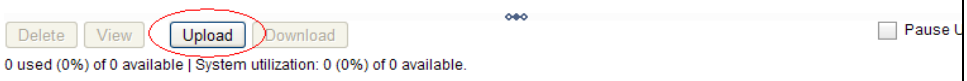
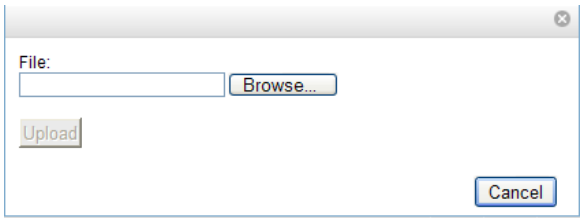
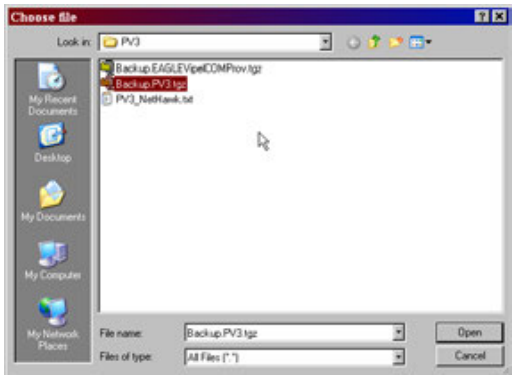
Recover any failed **SOAM and MP servers** by recovering software.

- Recover the software.
- Database is already intact at one SOAM server and does not require restoration at the other SOAM and MP servers.

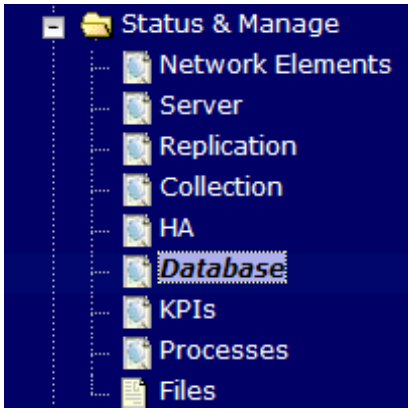
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

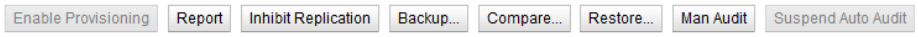
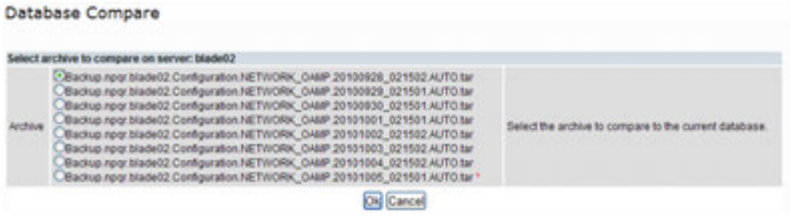
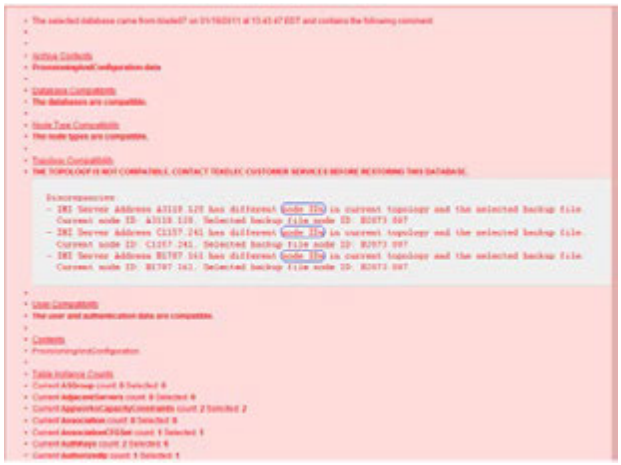
S T E P #	This procedure performs recovery if ALL NOAMP servers are failed but 1 or more SOAM servers are intact. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Gather Required Materials**	Gather the documents and required materials listed in **Section Required Materials**
2. ☐	**Recover the Failed Software**	Execute the following procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 2**: Deploy Oracle Communications User Data Repository Virtual Machines on VMware
3. ☐	**Obtain Latest Database Backup and Network Configuration Data.**	Obtain the most recent database backup file from external backup sources (ex. file servers) or tape backup sources. From required materials list in **Section Required Materials**; use site survey documents and Network Element report (if available), to determine network configuration data.
4. ☐	**Execute UDR Installation Procedure for the First NOAMP**	Configure the First NOAMP server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 3** "Configure NOAMP-A Server (1st NOAMP Only)" for first NOAMP. **Note:** If Topology or nodeId alarms are persistent after the database restore, refer to the steps below.
5. ☐	**Active NOAMP:** Login	Login to the NOAMP GUI as the ***guiadmin*** user:

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

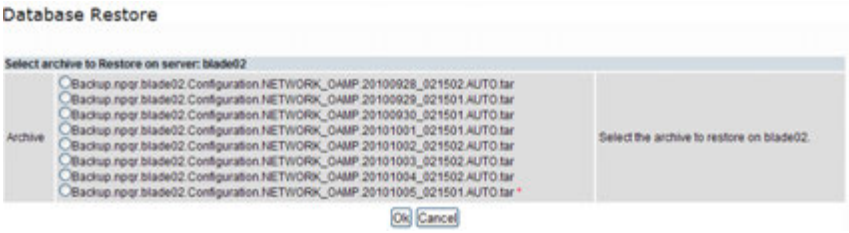
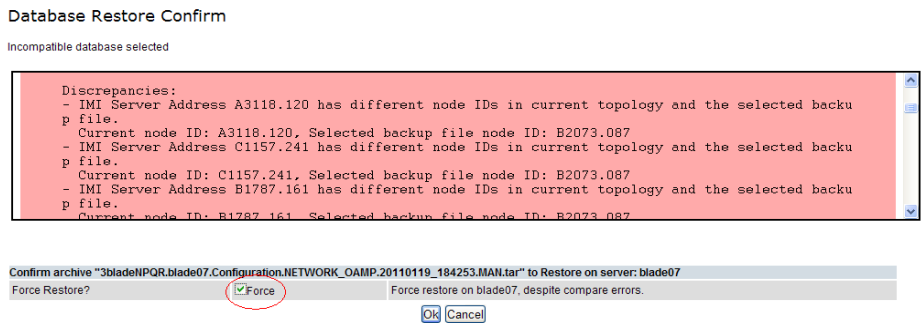
6. ☐	**Active NOAMP:** Upload the Backed up Database File	Browse to **Main Menu → Status & Manage → Files**  Select the Active NOAMP server. The following screen will appear:  Click on **Upload** as shown below and select the file *"NO Provisioning and Configuration:"* file backed up after initial installation and provisioning.  Click on **Browse** and locate the backup file and click on Open as shown below.   Click on the **Upload** button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete.

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

7. ☐	**Active NOAMP:** Disable Provisioning	Click on **Main Menu → Status & Manage → Database**  Disable Provisioning by clicking on **Disable Provisioning** button at the bottom of the screen as shown below. A confirmation window will appear, press **OK** to disable Provisioning. The message *"Warning Code 002"* may appear.

8. ☐	**Active NOAMP:** Verify the Archive Contents and Database Compatibility	Select the **Active NOAMP** server and click on the **Compare**.  The following screen is displayed; click the button for the restored database file that was uploaded as a part of **Step 13** of this procedure.  **Verify** that the output window matches the screen below. **Note:** You will get a database mismatch regarding the NodeIDs of the VMs. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS).  **Note:** Archive Contents and Database Compatibilities must be the following: **Archive Contents:** Configuration data **Database Compatibility:** The databases are compatible. **Note:** The following is expected Output for Topology Compatibility Check since we are restoring from existing backed up data base to database with just one NOAMP: **Topology Compatibility** THE TOPOLOGY SHOULD BE COMPATIBLE MINUS THE NODEID. **Note:** We are trying to restore a backed up database onto an empty NOAMP database. This is an expected text in Topology Compatibility. If the verification is successful, Click **BACK** button and continue to **next step** in this procedure.

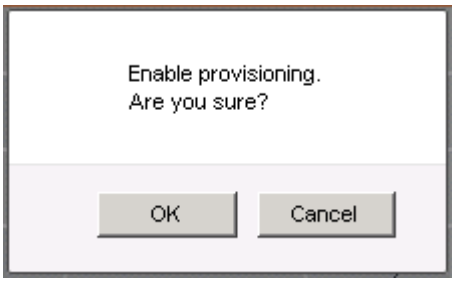
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

9. ☐	**Active NOAMP:** Restore the Database	Click on **Main Menu → Status & Manage → Database** Select the **Active NOAMP** server, and click on **Restore** as shown below. The following screen will be displayed. Select the proper back up provisioning and configuration file.  Click **OK** Button. The following confirmation screen will be displayed. **Note:** You will get a database mismatch regarding the NodeIDs of the servers. That is expected. If that is the only mismatch, proceed, otherwise stop and contact My Oracle Support (MOS). Select the **Force** checkbox as shown above and Click **OK** to proceed with the DB restore.  **Note:** After the restore has started, the user will be logged out of XMI NO GUI since the restored Topology is old data.

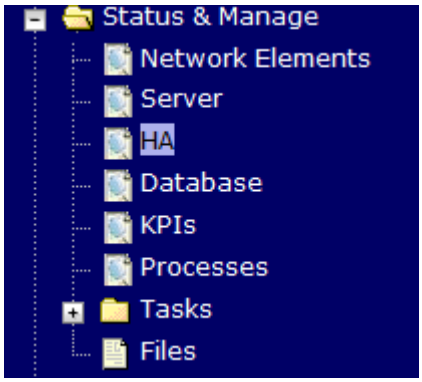
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

10. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:
11. ☐	**Active NOAMP:** Monitor and Confirm database restoral	Wait for **5-10 minutes** for the System to stabilize with the new topology: Monitor the Info tab for **"Success"**. This will indicate that the backup is complete and the system is stabilized. Following alarms **must** be ignored for NOAMP and MP Servers until all the Servers are configured: Alarms with Type Column as **"REPL"** , **"COLL", "HA"** (with mate NOAMP), **"DB"** (about Provisioning Manually Disabled) **Note:** Do not pay attention to alarms until all the servers in the system are completely restored. **Note:** The Configuration and Maintenance information will be in the same state it was backed up during initial backup.
12. ☐	**Active NOAMP:** Login	Login to the recovered Active NOAMP via SSH terminal as ***admusr*** user.

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

13. ☐	**Active NOAMP:** Restore /etc/hosts/ File of the Active NOAMP	Execute the following command: `$ sudo AppWorks AppWorks_AppWorks updateServerAliases <NOAMP Host Name>`
14. ☐	**Active NOAMP:** Re-enable Provisioning	Navigate to **Main Menu → Status & Manage → Database** Click on the **Enable Provisioning**. A pop-up window will appear to confirm as shown below, press **OK**. 
15. ☐	**Active NOAMP:** Recover Standby NOAMP **(HA Deployments Only)**	Configure the second NOAMP server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 2. **Procedure 10** "Apply Configuration for Remaining Servers" for second NOAMP. **Note:** If Topology or nodeId alarms are persistent after the database restore, refer to the steps below.
16. ☐	**Active NOAMP:** Recover remaining failed SOAM Servers	Repeat **Step 7** for any SOAM server that needs to be recovered.

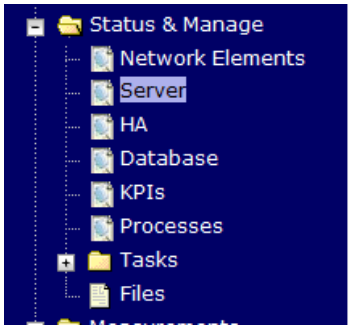
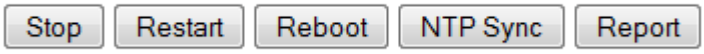
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

17. ☐	**Active NOAMP:** Set HA on all C-Level Servers	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
18. ☐	**Recovered Servers:** Login	Establish an SSH to the recovered server's XMI address:

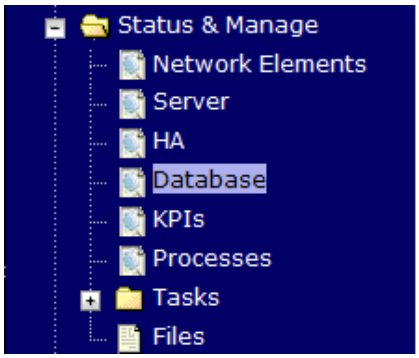
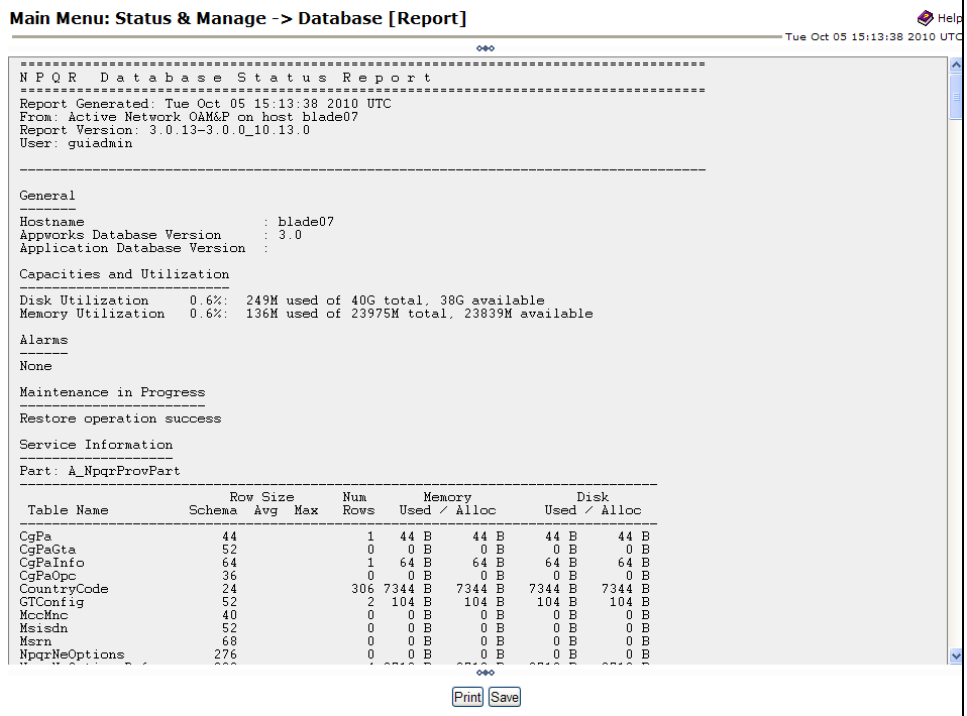
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

19. ☐	**Recovered Servers:** Sync NTP	1) Perform the following to retrieve the remote NTP server:
		`$ sudo ntpq –np`
		Example output:
		`[admusr@NOAMP-2 ~]$ ntpq -np`
		`remote refid st t when poll reach delay offset jitter`
		`==============================================================================`
		`*10.240.9.186 10.250.33.2 3 u 356 1024 377 1.409 0.113 2.434`
		2) Stop ntpd service:
		`$ sudo service ntpd stop`
		3) Sync the date to the ntp remote server:
		`$ sudo ntpdate <NTP remote server>`
		Note: The remote server below will be that of the one gathered in sub step 1.
		4) Start the ntp service:
		`$ sudo service ntpd start`

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

20. ☐	**Active NOAMP:** Restart UDR application on recovered servers	Navigate to **Main Menu → Status & Manage → Server**,  Select each recovered server and click on **Restart**. 
21. ☐	**Active NOAMP:** Perform key exchange between the active-NOAMP and recovered servers.	Establish an SSH session to the Active NOAMP, login as ***admusr.*** Execute the following command to perform a keyexchange from the active NOAMP to each recovered server: `$ keyexchange admusr@<Recovered Server Hostname>` **Note:** If an export server is configured, perform this step.

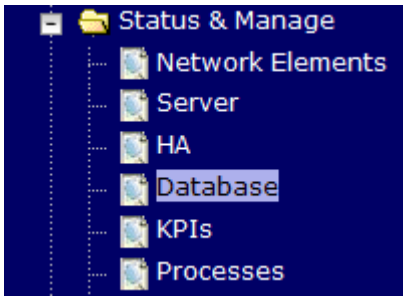
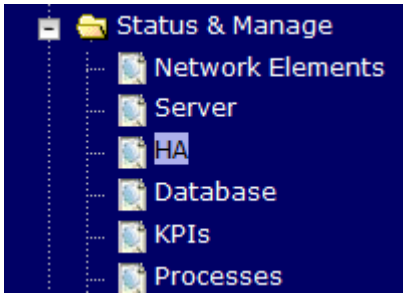
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

22. ☐	**Active NOAMP:** Fetch and Store the database Report for the Newly Restored Data and Save it	Navigate to **Main Menu → Status & Manage → Database**  Select the **active** NOAMP server and click on the **Report** button at the bottom of the page. The following screen is displayed:  Click on **Save** and save the report to your local machine.

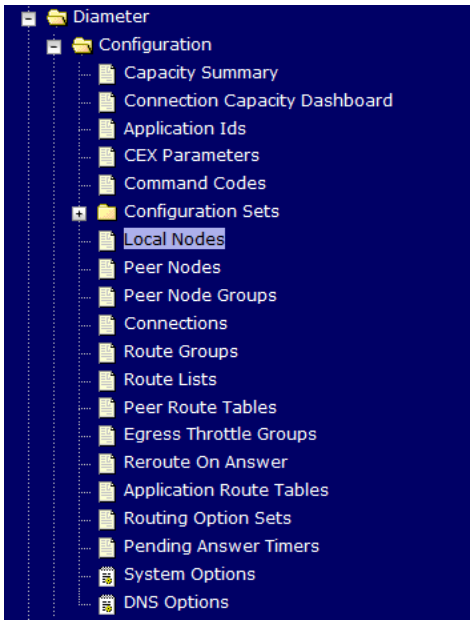
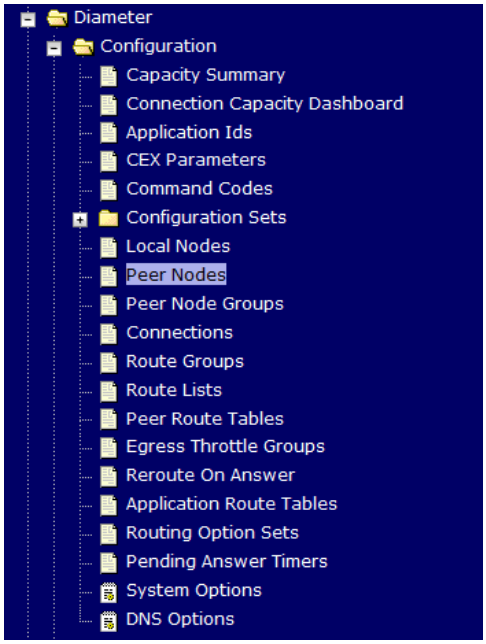
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

23. ☐	**Active NOAMP:**
	Verify Replication Between Servers.
		Login to the Active NOAMP via SSH terminal as ***admusr*** user.
		Execute the following command:
		$ sudo irepstat –m
		Output like below shall be generated:
		`-- Policy 0 ActStb [DbReplication] ----------`
		`RDU06-MP1 -- Stby`
		`  BC From RDU06-SO1 Active  0  0.50 ^0.17%cpu 42B/s  A=none`
		`  CC From RDU06-MP2 Active  0  0.10 ^0.17 0.88%cpu 32B/s  A=none`
		`RDU06-MP2 -- Active`
		`  BC From RDU06-SO1 Active  0  0.50 ^0.10%cpu 33B/s  A=none`
		`  CC To  RDU06-MP1 Active  0  0.10  0.08%cpu 20B/s  A=none`
		`RDU06-NO1 -- Active`
		`  AB To  RDU06-SO1 Active  0  0.50 1%R 0.03%cpu 21B/s`
		`RDU06-SO1 -- Active`
		`  AB From RDU06-NO1 Active  0  0.50 ^0.04%cpu 24B/s`
		`  BC To  RDU06-MP1 Active  0  0.50 1%R 0.04%cpu 21B/s`
		`  BC To  RDU06-MP2 Active  0  0.50 1%R 0.07%cpu 21B/s`

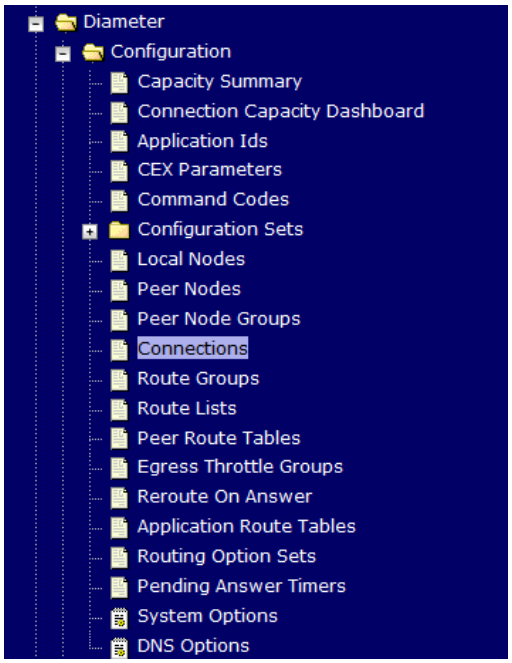
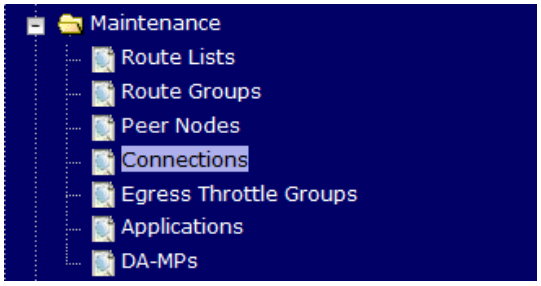
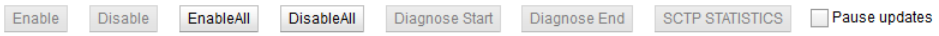
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

24. ☐	**Active NOAMP:** Verify the Database states	Click on **Main Menu → Status and Manager → Database**  Verify that the "OAM Max HA Role" is either "Active" or "Standby" for NOAMP and SOAM and "Application Max HA Role" for MPs is "Active", and that the status is "Normal" as shown below: Network Element | Server | Role | OAM Max HA Role | Application Max HA Role | Status | DB Level | OAM Repl Status | SIG Repl Status | Repl Status | Repl Audit Status NO_10303 | NO2 | Network OAM&P | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | PSBR | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | MP2 | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO1 | System OAM | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg NO_10303 | NO1 | Network OAM&P | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | IPFE | MP | Active | OOS | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO2 | System OAM | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg
25. ☐	**Active NOAMP:** Verify the HA Status	Click on **Main Menu → Status and Manage → HA**  Select the row for all of the servers Verify that the "HA Role" is either "Active" or "Standby". Hostname | OAM Max HA Role | Application Max HA Role | Max Allowed HA Role | Mate Hostname List | Network Element | Server Role | Active VIPs NO2 | Active | OOS | Active | NO1 | NO_10303 | Network OAM&P | 10.240.70.132 SO1 | Standby | OOS | Active | SO2 | SO_10303 | System OAM | SO2 | Active | OOS | Active | SO1 | SO_10303 | System OAM | 10.240.70.133 MP1 | Standby | Active | Active | MP2 | SO_10303 | MP | MP2 | Active | Active | Active | MP1 | SO_10303 | MP | IPFE | Active | OOS | Active | | SO_10303 | MP |

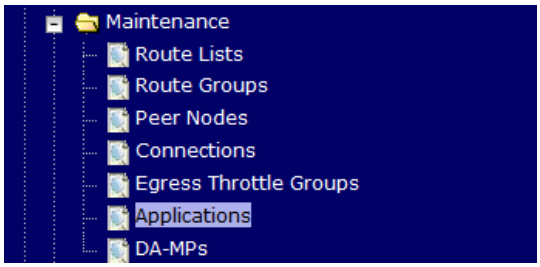
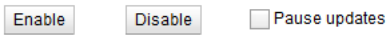
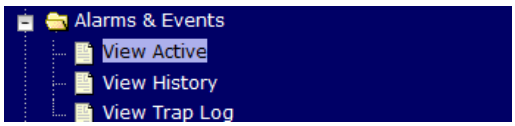
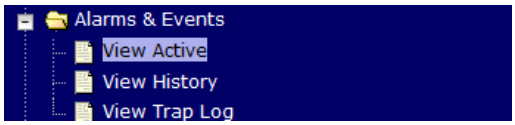
Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

26. ☐	**Active SOAM:** Verify the Local Node Info	Navigate to **Main Menu → Diameter → Configuration → Local Node**  Verify that all the local nodes are shown.
27. ☐	**Active SOAM:** Verify the Peer Node Info	Navigate to **Main Menu → Diameter → Configuration → Peer Node**  Verify that all the peer nodes are shown.

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

28. ☐	**Active SOAM:** Verify the Connections Info	Navigate to **Main Menu → Diameter → Configuration → Connections**  Verify that all the connections are shown.
29. ☐	**Active SOAM:** Enable Connections if needed	Navigate to **Main Menu → Diameter → Maintenance → Connections**  Select each connection and click on the **Enable** button. Alternatively you can enable all the connections by selecting the **EnableAll** button.  Verify that the Operational State is Available.

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

30. ☐	**Active SOAM:** Enable Optional Features	Navigate to **Main Menu → Diameter → Maintenance → Applications**  Select the SPR feature application. Click the **Enable** button. 
31. ☐	**Active SOAM:** Examine All Alarms	Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
32. ☐	**Active NOAMP:** Examine All Alarms	Login to the NOAMP VIP if not already logged in. Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
33. ☐	**Restore GUI Usernames and Passwords**	If applicable, Execute steps in **Section 5** to recover the user and group information restored.

Procedure 3: Recovery Scenario 3 – Partial Outage One SOAM Intact

34. ☐	**Backup and Archive All the Databases from the Recovered System**	Execute **Appendix A Oracle Communications User** Data Repository Database Backup to back up the Configuration databases.
THIS PROCEDURE HAS BEEN COMPLETED		

4.1.4 Recovery Scenario 4 (Partial Server Outage with one NOAMP server and one SOAM server intact)

For a partial outage with an NOAMP server and an SOAM server intact and available, only base recovery of software is needed. The intact NO and SOAM servers are capable of restoring the database via replication to all servers. The major activities are summarized in the list below. Use this list to understand the recovery procedure summary. Do not use this list to execute the procedure. The actual procedures' detailed steps are in Procedure 4. The major activities are summarized as follows:

Recover Standby NOAMP server by recovering software.

- Recover the software.

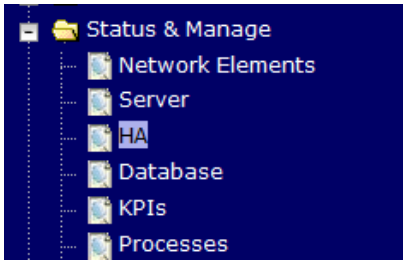
The database is intact at the active NOAMP server and does not require restoration at the standby NOAMP server.

- Recover any failed SO and MP servers by recovering software.
- Recover the software.

The database in intact at the active NOAMP server and does not require restoration at the SO and MP servers.

- Re-apply signaling networks configuration if the failed VM is an MP.

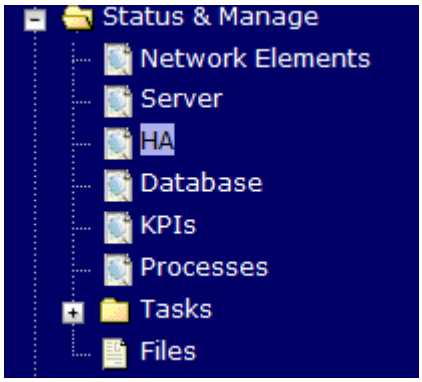
Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

S T E P #		
	This procedure performs recovery if at least 1 NOAMP server is intact and available and 1 SOAM server is intact and available. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Gather Required Materials**	Gather the documents and required materials listed in **Section 3.1 Required Materials**
2. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:
3. ☐	**Active NOAMP:** Set Failed Servers to Standby	Navigate to **Main Menu → Status & Manage → HA**  Select **Edit** Set the Max Allowed HA Role drop down box to **Standby** for the failed servers. Select **Ok**

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

4. ☐	**Recover the Failed Software**	Execute the following procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 2**: Deploy Oracle Communications User Data Repository Virtual Machines on VMware
5. ☐	**Repeat for Remaining Failed Servers**	If necessary, repeat **4** for all remaining failed servers.
6. ☐	**Active NOAMP:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:
7. ☐	**Active NOAMP:** Recover Standby NOAMP if needed	Configure the second NOAMP server by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 2. **Procedure 10** "Apply Configuration for Remaining Servers" **Note:** If Topology or nodeId alarms are persistent after the database restore, refer to the steps below.

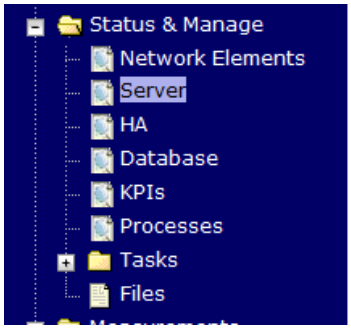
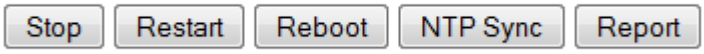
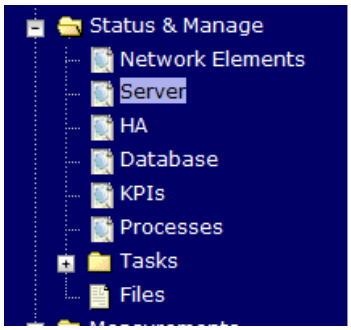
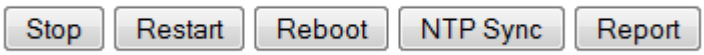
Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

8. ☐	**Active NOAMP:** Recover the Failed SOAM Servers if needed	Repeat **Step 7** for any SOAM server that needs to be recovered.
9. ☐	**Active NOAMP:** Set HA on Recovered Servers	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
10.	**Recovered Servers:** Login	Establish an SSH to the recovered server's XMI address:

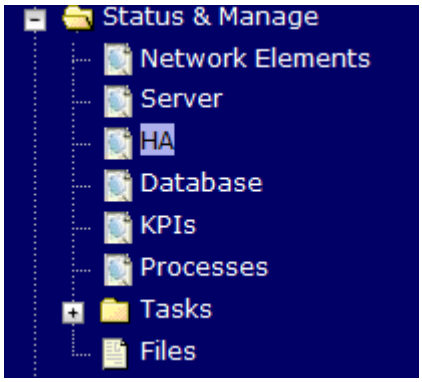
Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

11.	**Recovered Servers:** Sync NTP	1) Perform the following to retrieve the remote NTP server:
		
		`$ sudo ntpq –np`
		
		Example output:
		
		`[admusr@NOAMP-2 ~]$ ntpq -np`
		`remote refid st t when poll reach delay offset jitter`
		`==============================================================================`
		`*10.240.9.186 10.250.33.2 3 u 356 1024 377 1.409 0.113 2.434`
		
		2) Stop ntpd service:
		
		`$ sudo service ntpd stop`
		
		3) Sync the date to the ntp remote server:
		
		`$ sudo ntpdate <NTP remote server>`
		
		Note: The remote server below will be that of the one gathered in sub step 1.
		
		4) Start the ntp service:
		
		`$ sudo service ntpd start`

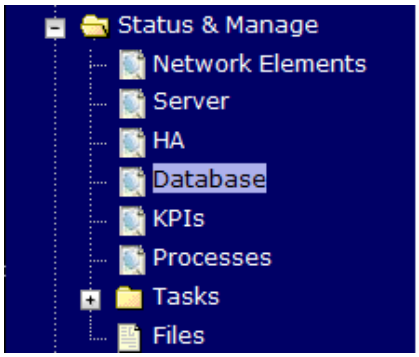
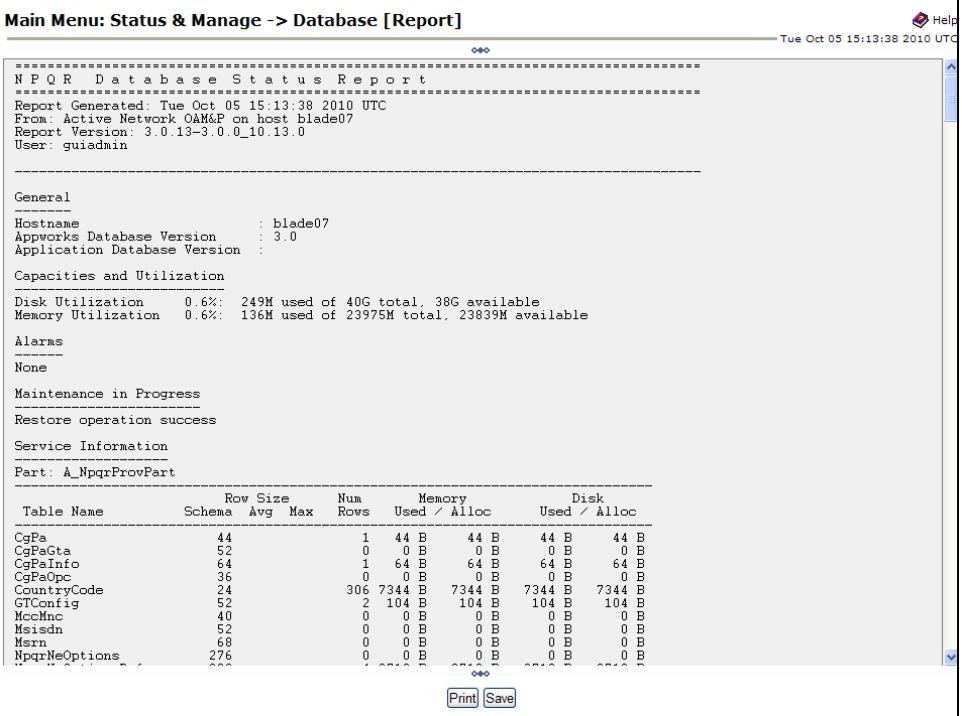
Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

12.	**Active NOAMP:** Restart UDR application on recovered SOAM	Navigate to **Main Menu → Status & Manage → Server**  Select the recovered server and click on **Restart**. 
13. ☐	**Active NOAMP:** Recover MP Servers	Recover the MP server(s) by executing procedures from reference *Oracle Communications User Data Repository 12.2 Cloud Installation and Configuration Guide*, E72454-01, *latest revision* [2]: **Procedure 4** "Create Configuration for Remaining Servers", Step 2 **Procedure 10** "Apply Configuration for Remaining Servers" for MP(s)
14. ☐	**Active NOAMP:** Restart UDR Application on recovered MP servers.	Navigate to **Main Menu → Status & Manage → Server**  Select the recovered servers and click on **Restart**. 

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

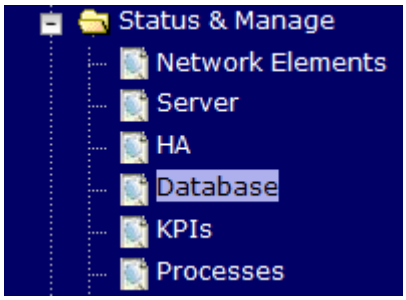
15. ☐	**Active NOAMP:** Set HA on all MP servers	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
16. ☐	**Active NOAMP:** Login	Login to the recovered Active NOAMP via SSH terminal as ***admusr*** user.
17. ☐	**Active NOAMP:** Perform key exchange between the active-NOAMP and recovered servers.	Establish an SSH session to the Active NOAMP, login as ***admusr.*** Execute the following command to perform a keyexchange from the active NOAMP to each recovered server: `$ keyexchange admusr@<Recovered Server Hostname>`
18. ☐	**Active NOAMP:** Establish SSH	Establish an SSH session to the active NOAMP, login as ***admusr.***

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

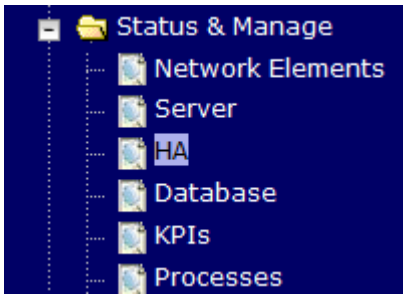
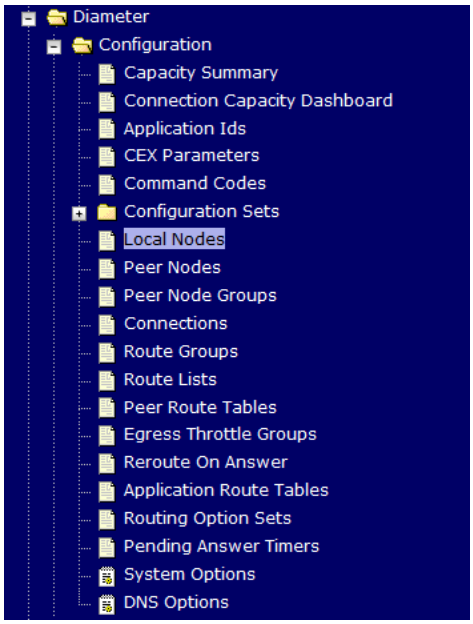
19. ☐	**Active NOAMP:** Fetch and Store the database Report for the Newly Restored Data and Save it	Navigate to **Main Menu → Status & Manage → Database**  Select the **active** NOAMP server and click on the **Report** button at the bottom of the page. The following screen is displayed:  Click on **Save** and save the report to your local machine.

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

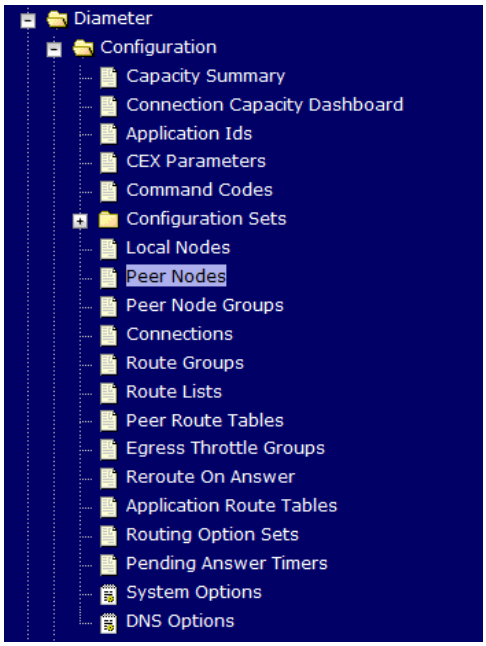
20. ☐	**Active NOAMP:** Verify Replication Between Servers.	Login to the Active NOAMP via SSH terminal as ***admusr*** user.
		Execute the following command:
		$ sudo irepstat –m
		Output like below shall be generated:
		`-- Policy 0 ActStb [DbReplication] ----------`
		`RDU06-MP1 -- Stby`
		`BC From RDU06-SO1 Active 0 0.50 ^0.17%cpu 42B/s A=none`
		`CC From RDU06-MP2 Active 0 0.10 ^0.17 0.88%cpu 32B/s A=none`
		`RDU06-MP2 -- Active`
		`BC From RDU06-SO1 Active 0 0.50 ^0.10%cpu 33B/s A=none`
		`CC To RDU06-MP1 Active 0 0.10 0.08%cpu 20B/s A=none`
		`RDU06-NO1 -- Active`
		`AB To RDU06-SO1 Active 0 0.50 1%R 0.03%cpu 21B/s`
		`RDU06-SO1 -- Active`
		`AB From RDU06-NO1 Active 0 0.50 ^0.04%cpu 24B/s`
		`BC To RDU06-MP1 Active 0 0.50 1%R 0.04%cpu 21B/s`
		`BC To RDU06-MP2 Active 0 0.50 1%R 0.07%cpu 21B/s`

21. ☐	**Active NOAMP:** Verify the Database states	Click on **Main Menu → Status and Manager → Database**  Verify that the "OAM Max HA Role" is either "Active" or "Standby" for NOAMP and SOAM and "Application Max HA Role" for MPs is "Active", and that the status is "Normal" as shown below: Network Element | Server | Role | OAM Max HA Role | Application Max HA Role | Status | DB Level | OAM Repl Status | SIG Repl Status | Repl Status | Repl Audit Status NO_10303 | NO2 | Network OAM&P | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | PSBR | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | MP2 | MP | Active | Active | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO1 | System OAM | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg NO_10303 | NO1 | Network OAM&P | Standby | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg SO_10303 | IPFE | MP | Active | OOS | Normal | 0 | Normal | Normal | Allowed | AutoInProg SO_10303 | SO2 | System OAM | Active | OOS | Normal | 0 | Normal | NotApplicabl | Allowed | AutoInProg

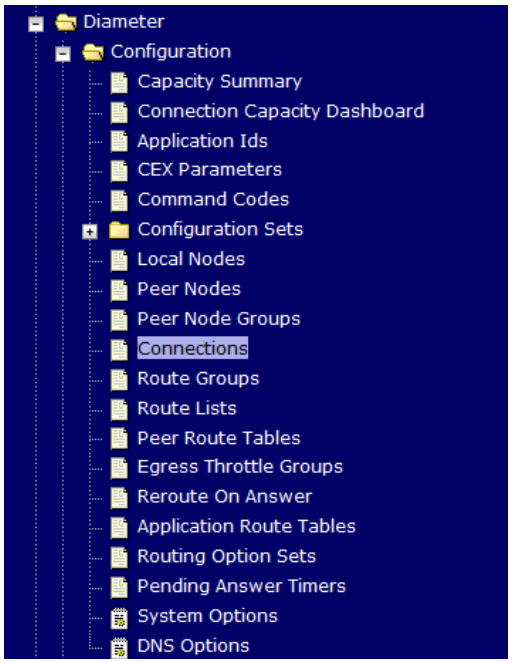
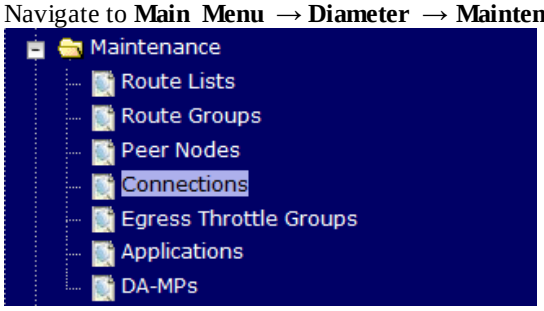
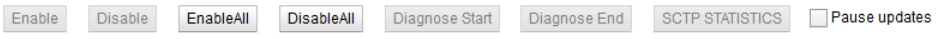
Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

22. ☐	**Active NOAMP:** Verify the HA Status	Click on **Main Menu → Status and Manage → HA**  Select the row for all of the servers Verify that the "HA Role" is either "Active" or "Standby". Hostname | OAM Max HA Role | Application Max HA Role | Max Allowed HA Role | Mate Hostname List | Network Element | Server Role | Active VIPs NO2 | Active | OOS | Active | NO1 | NO_10303 | Network OAM&P | 10.240.70.132 SO1 | Standby | OOS | Active | SO2 | SO_10303 | System OAM | SO2 | Active | OOS | Active | SO1 | SO_10303 | System OAM | 10.240.70.133 MP1 | Standby | Active | Active | MP2 | SO_10303 | MP | MP2 | Active | Active | Active | MP1 | SO_10303 | MP | IPFE | Active | OOS | Active | | SO_10303 | MP |
23. ☐	**Active SOAM:** Verify the Local Node Info	Navigate to **Main Menu → Diameter → Configuration → Local Node**  Verify that all the local nodes are shown.

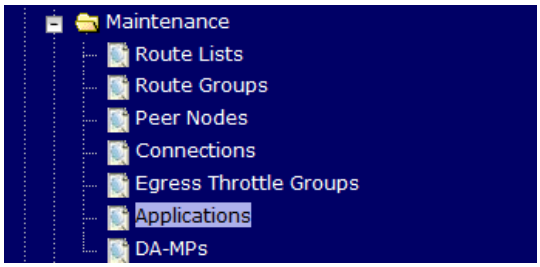
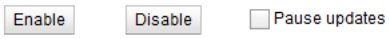
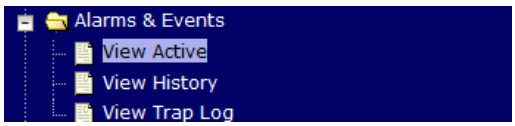
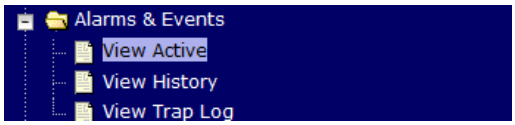
Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

24. ☐	**Active SOAM:** Verify the Peer Node Info	Navigate to **Main Menu → Diameter → Configuration → Peer Node**  Verify that all the peer nodes are shown.

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

25. ☐	**Active SOAM:** Verify the Connections Info	Navigate to **Main Menu → Diameter → Configuration → Connections**  Verify that all the connections are shown.
26. ☐	**Active SOAM:** Enable Connections if needed	Navigate to **Main Menu → Diameter → Maintenance → Connections**  Select each connection and click on the **Enable** button. Alternatively you can enable all the connections by selecting the **EnableAll** button.  Verify that the Operational State is Available.

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

27. ☐	**Active SOAM:** Enable Optional Features	Navigate to **Main Menu → Diameter → Maintenance → Applications**  Select the SPR feature applications. Click the **Enable** button. 
28. ☐	**Active SOAM:** Examine All Alarms	Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).
29. ☐	**Active NOAMP:** Examine All Alarms	Login to the NOAMP VIP if not already logged in. Navigate to **Main Menu → Alarms & Events → View Active**  Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS).

Procedure 4: Recovery Scenario 4 – Partial Outage One NOAMP & One SOAM Intact

30. ☐	**Restart oampAgent if Needed**	Note: If alarm "10012: The responder for a monitored table failed to respond to a table change" is raised, the oampAgent needs to be restarted.
		
		Establish an SSH session to each server that has the alarm.
		Login as ***admusr***
		
		Execute the following commands:
		
		`$ sudo pm.set off oampAgent`
		`$ sudo pm.set on oampAgent`

31. ☐	**Backup and Archive All the Databases from the Recovered System**	Execute **Appendix A Oracle Communications User** Data Repository Database Backup to back up the Configuration databases.
THIS PROCEDURE HAS BEEN COMPLETED		

4.1.5 Recovery Scenario 5 (Database Recovery)

The following sections deal with recovering from database corruption, whether a backup is present or not.

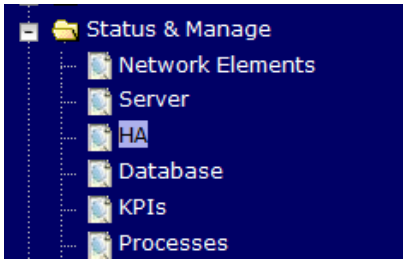
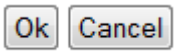
4.1.5.1 Recovery Scenario 5: Case 1

For a partial outage with

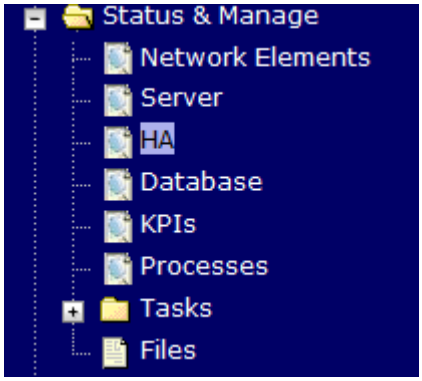
- Server having a corrupted database
- Replication channel from parent is inhibited because of upgrade activity or
- Server is in a different release then that of its Active parent because of upgrade activity.
- Verify that the Server Runtime backup files, performed at the start of the upgrade, are present in /var/TKLC/db/filemgmt area in the following format
  - Backup.UDR.HPC02-NO2.FullDBParts.NETWORK_OAMP.20140524_223507.UPG.tar.bz2
  - Backup.UDR.HPC02-NO2.FullRunEnv.NETWORK_OAMP.20140524_223507.UPG.tar.bz2

Note: During recovery, the corrupted Database will get replaced by the sever Runtime backup. Any configuration done after taking the backup will not be visible post recovery.

Procedure 5: Recovery Scenario 5 (Case 1) – Database Recovery Backup Present

S T E P #		
	This procedure performs recovery if database is corrupted in the system Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Active NOAMP:** Set Failed Servers to Standby	Navigate to **Main Menu → Status & Manage → HA**  Select **Edit** Set the Max Allowed HA Role drop down box to **Standby** for the failed servers. Select **Ok** 
2. ☐	**Server with DB Corruption:** Login	Establish an SSH session to the server in question. Login as ***admusr*** user.
3. ☐	**Server with DB Corruption:** Change runlevel to 3	Execute the following command to bring the system to runlevel 3. `$ sudo init 3`

Procedure 5: Recovery Scenario 5 (Case 1) – Database Recovery Backup Present

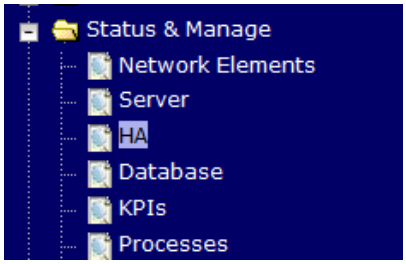
4. ☐	**Server with DB Corruption:** Recover System	Execute the following command and follow the instructions appearing the console prompt `$ sudo /usr/TKLC/appworks/sbin/backout_restore`
5. ☐	**Server with DB Corruption:** Change runlevel to 4	Execute the following command to bring the systemback to runlevel 4. `$ sudo init 4`
6. ☐	**Server with DB Corruption:** Verify the server	Execute the following command to verify if the processes are up and running `$ sudo pm.getprocs`
7. ☐	**Active NOAMP:** Set Failed Servers to Active	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each failed server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
8. ☐	**Backup and Archive All the Databases from the Recovered System**	Execute **Appendix A Oracle Communications User** Data Repository Database Backup to back up the Configuration databases:
THIS PROCEDURE HAS BEEN COMPLETED		

4.1.5.2 Recovery Scenario 5: Case 2

For a partial outage with

- Server having a corrupted database
- Replication channel is available or
- Server has the same release as that of its Active parent

Procedure 6: Recovery Scenario 5 (Case 2) – Database Recovery Backup Not Present

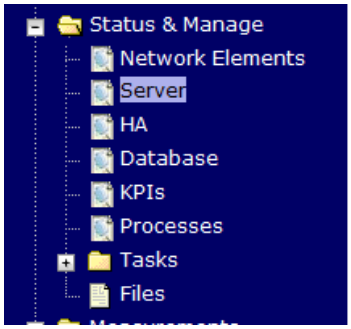
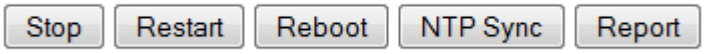
S T E P #	This procedure performs recovery if database got corrupted in the system and system is in the state to get replicated Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Active NOAMP:** Set Failed Servers to Standby	Navigate to **Main Menu → Status & Manage → HA**  Select **Edit** Set the Max Allowed HA Role drop down box to **Standby** for the failed servers. Select **Ok** Ok Cancel
2. ☐	**Server with DB Corruption:** Login	Establish an SSH session to the server in question. Login as ***admusr*** user.

3. ☐	**Server with DB Corruption:** Take Server out of Service	Execute the following command to take the server out of service.
		`$ sudo bash –l`
		`$ sudo prod.clobber`

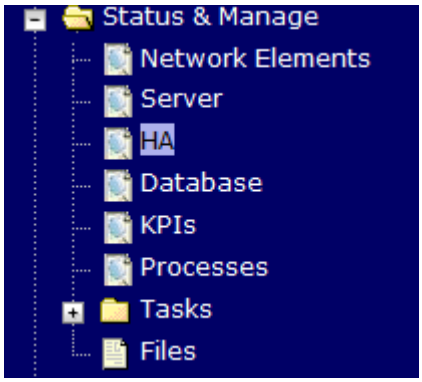
4. ☐	**Server with DB Corruption:**
	Take Server to DbUp State and Start the Application
		Execute the following commands to take the server to Dbup and start the Oracle Communications User Data Repository application:
		`$ sudo bash –l`
		`$ sudo prod.start`

Procedure 6: Recovery Scenario 5 (Case 2) – Database Recovery Backup Not Present

5. ☐	**Server with DB Corruption:**
	Verify the Server State
		Execute the following commands to verify the processes are up and running:
		`$ sudo pm.getprocs`
		Execute the following command to verify if replication channels are up and running:
		`$ sudo irepstat`
		Execute the following command to verify if merging channels are up and running:
		`$ sudo inetmstat`

6. ☐	**Active NOAMP:** Restart UDR application	Navigate to **Main Menu → Status & Manage → Server**  Select each recovered server and click on **Restart**. 

Procedure 6: Recovery Scenario 5 (Case 2) – Database Recovery Backup Not Present

7. ☐	**Active NOAMP:** Set Failed Servers to Active	Navigate to **Status & Manage → HA**  Click on **Edit** at the bottom of the screen For each failed server whose Max Allowed HA Role is set to Standby, set it to **Active** Press **OK**
8. ☐	**Backup and Archive All the Databases from the Recovered System**	Execute **Appendix A Oracle Communications User** Data Repository Database Backup to back up the Configuration databases:
THIS PROCEDURE HAS BEEN COMPLETED		

5 RESOLVING USER CREDENTIAL ISSUES AFTER DATABASE RESTORE

User incompatibilities may introduce security holes or prevent access to the network by administrators. User incompatibilities are not dangerous to the database, however. Review each user difference carefully to ensure that the restoration will not impact security or accessibility.

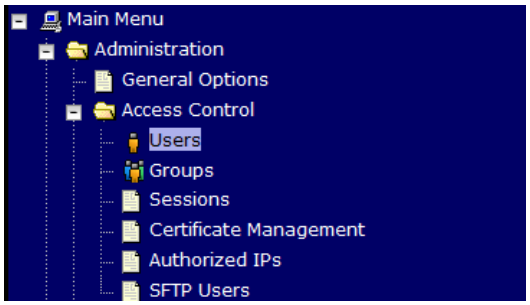
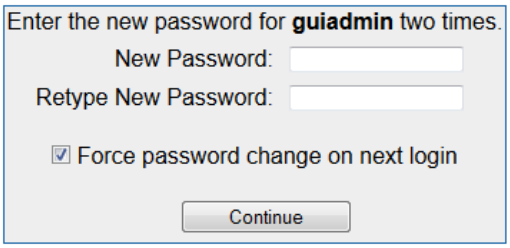
5.1 Keeping a Restored User (Resetting User Password)

User accounts kept across a restore operation should have their passwords reset. This procedure guides you through that process.

Procedure 7: Keep Restored User (Resetting User Password)

S T E P #		
	Perform this procedure to keep users that will be restored by system restoration. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Before Restoration:** Notify Affected Users *(Before Restoration)*	Contact each user that is affected **before the restoration** and notify them that you will reset their password during this maintenance operation.
2. ☐	**After Restoration:** Login to the Active NOAMP *(Before Restoration)*	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

Procedure 7: Keep Restored User (Resetting User Password)

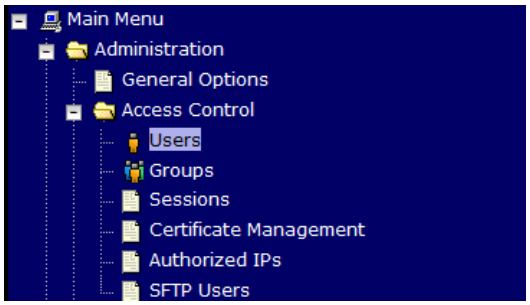
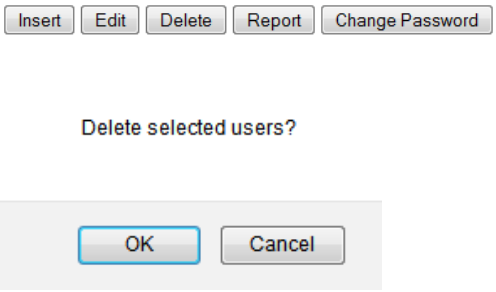
3. ☐	**After Restoration:** Reset User Passwords	Navigate to **Administration** → **Access Control** → **Users**  Select the user Click the **Change Password** button Enter a new password  Click the **Continue** button
THIS PROCEDURE HAS BEEN COMPLETED		

5.2 Removing a Restored User

Procedure 8: Remove the Restored User

S T E P #		
	Perform this procedure to remove users that will be restored by system restoration Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**After Restoration:** Login to the Active NOAMP	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

Procedure 8: Remove the Restored User

2. ☐	**After Restoration:** Delete User	Navigate to **Administration** → **Access Control** → **Users**  Select the user Click the **Delete** button  Click the **OK** button to confirm.
THIS PROCEDURE HAS BEEN COMPLETED		

5.3 Restoring a Modified User

These users have had a password change prior to creation of the backup and archive file. The will be reverted by system restoration of that file.

```
- The password for user 'testuser' differs between the selected backup file
and the current database.
```

Before Restoration:

Verify that you have access to a user with administrator permissions that is not affected.

Contact each user that is affected and notify them that you will reset their password during this maintenance operation.

After Restoration:

Log in and reset the passwords for all users in this category. See the steps in Section 5.1 (Keeping a Restored User) for resetting passwords for a user.

5.4 Restoring an Archive that does not contain a Current User

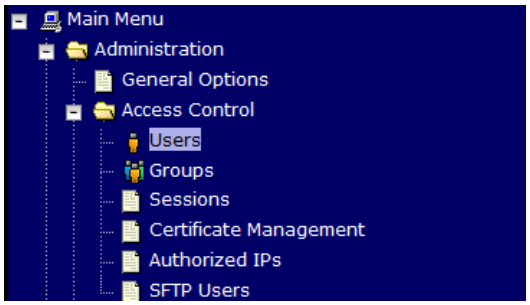
These users have been created after the backup operation. The will be deleted by system restoration of that file.

If the user is no longer desired, do not perform any additional steps. The user is permanently removed.

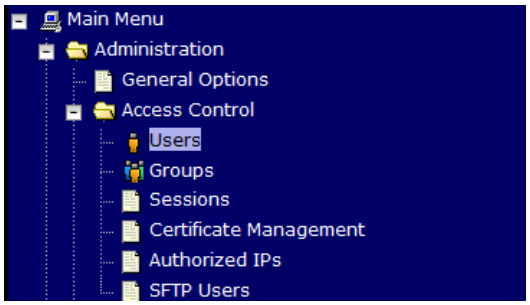
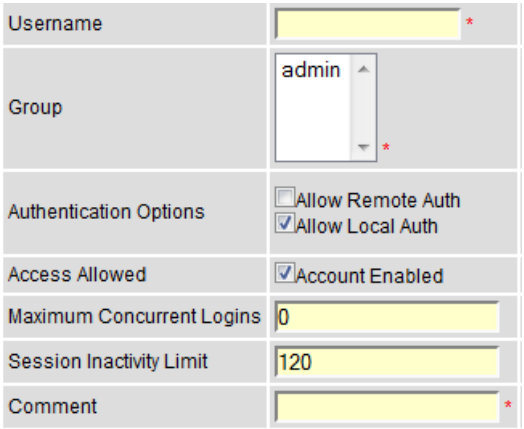
Procedure 9: Restoring an Archive that does not Contain a Current User

S T E P #		
	Perform this procedure to remove users that will be restored by system restoration Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Before Restoration:** Notify Affected Users *(Before Restoration)*	Contact each user that is affected **before the restoration** and notify them that you will reset their password during this maintenance operation.
2. ☐	**Before Restoration:** Login to the Active NOAMP *(Before Restoration)*	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

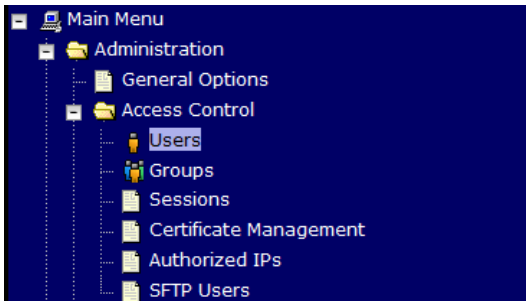
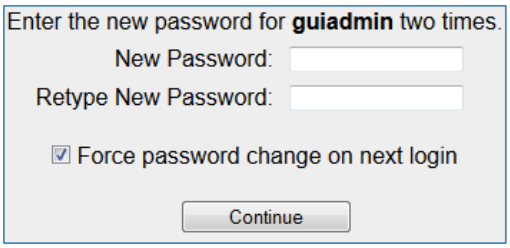
Procedure 9: Restoring an Archive that does not Contain a Current User

3. ☐	**Before Restoration:** Record user settings *(Before Restoration)*	Navigate to **Administration → Access Control → Users**  Under each affected user, record the following: • Username, • Account status • Remote Auth • Local Auth • Concurrent Logins Allowed • Inactivity Limit • Comment • Groups
4. ☐	**After Restoration:** Login	Establish a GUI session on the NOAMP server by using the VIP IP address of the NOAMP server. Open the web browser and enter a URL of: `http://<Primary_NOAMP_VIP_IP_Address>` Login as the ***guiadmin*** user:

Procedure 9: Restoring an Archive that does not Contain a Current User

5. ☐	**After Restoration:** Recreate affected user	Navigate to **Administration → Access Control → Users**  Click **Insert** Recreate the user using the data collected in **Step 3.**  Click **Ok**
6. ☐	**After Restoration:** Repeat for Additional Users	Repeat **Step 5** to recreate additional users.

Procedure 9: Restoring an Archive that does not Contain a Current User

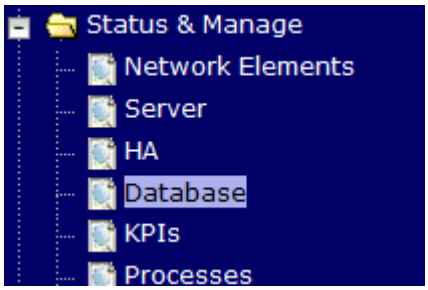
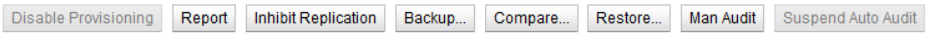
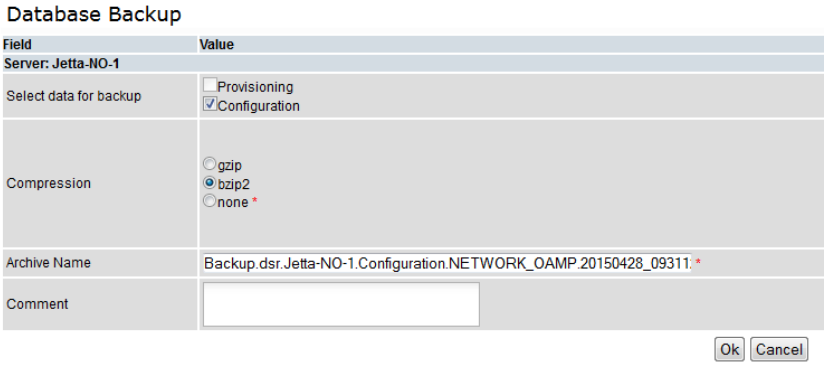
7. ☐	**After Restoration:** Reset the Passwords	Navigate to **Administration** → **Access Control** → **Users**  Select the user Click the **Change Password** button Enter a new password  Click the **Continue** button
THIS PROCEDURE HAS BEEN COMPLETED		

Appendix A. Oracle Communications User Data Repository Database Backup

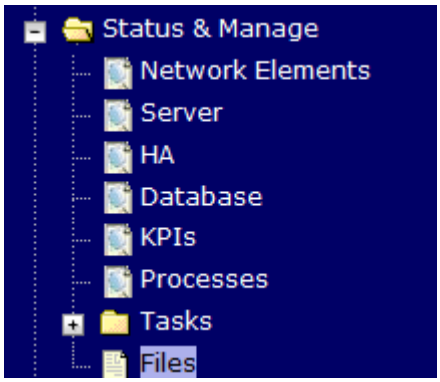
Procedure 12: Restoring an Archive that does not Contain a Current User

S T E P #		
	The intent of this procedure is to back up the provision and configuration information from an NOAMP or SOAM server after the disaster recovery is complete Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Active NOAMP/SOAM:** Login	Establish a GUI session on the Active NOAMP or SOAM server by using the VIP IP address of the NOAMP or SOAM server. Open the web browser and enter a URL of: `http://<Primary_NOAMP/SOAM_VIP_IP_Address>` Login as the ***guiadmin*** user:

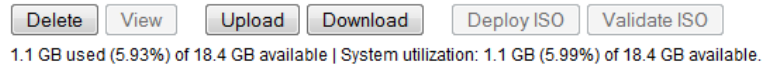
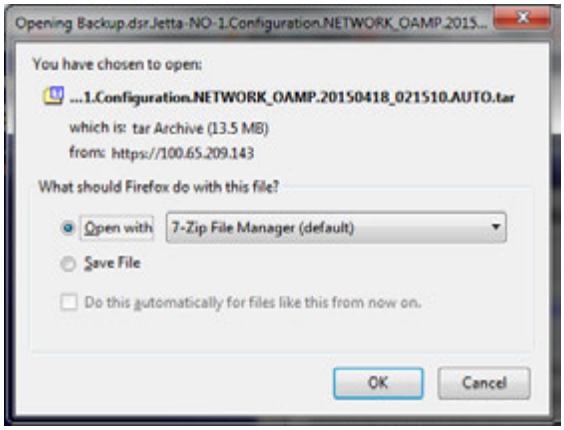
Procedure 12: Restoring an Archive that does not Contain a Current User

2. ☐	**Active NOAMP/SOAM:** Backup Configuration Data for the System	Navigate to **Main Menu → Status & Manage → Database**  Select the Active NOAMP Server and Click on **Backup** button  Make sure that the checkboxes next to "Configuration" is checked.  Enter a filename for the backup and press **OK**

Procedure 12: Restoring an Archive that does not Contain a Current User

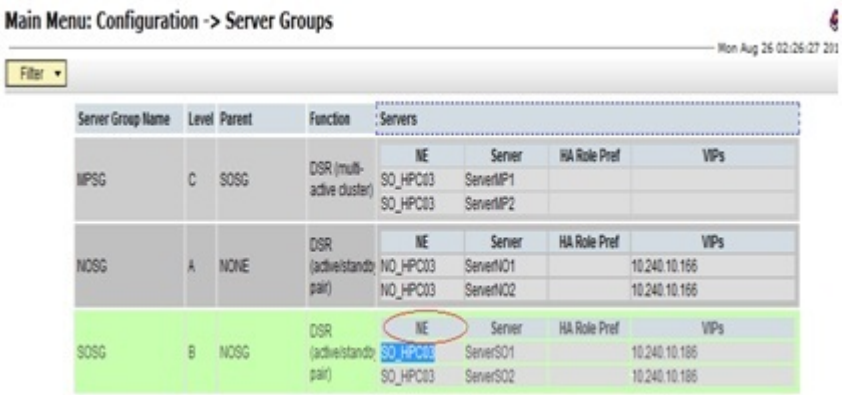
3. ☐	**Active NOAMP/SOAM:** Verify the backup file existence.	Navigate to **Main Menu → Status & Manage → Files**  **Main Menu: Status & Manage -> Files** Filter Tasks Jetta-NO-1 | Jetta-NO-2 | Jetta-SO-1 | Jetta-SO-2 | Jetta-DAMP-1 | Jetta-DAMP-2 File Name Backup.DSR.Jetta-NO-1.FullDBParts.NETWORK_OAMP.20150421_143846.UPG.tar.bz2 Backup.DSR.Jetta-NO-1.FullRunEnv.NETWORK_OAMP.20150421_143846.UPG.tar.bz2 backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150414_021511.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150415_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150416_021511.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150417_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150418_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150419_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150420_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150421_021511.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150422_021511.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150423_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150424_021511.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150425_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150426_021510.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150427_021511.AUTO.tar backup/Backup.dsr.Jetta-NO-1.Configuration.NETWORK_OAMP.20150428_021511.AUTO.tar Select the Active NOAMP or SOAM tab. The files on this server will be displayed. Verify the existence of the backup file.

Procedure 12: Restoring an Archive that does not Contain a Current User

4. ☐	**Active NOAMP/SOAM:** Download the file to a local machine.	From the previous step, choose the backup file. Select the **Download** button  Select **OK** to confirm the download. 
5. ☐	**Upload the Image to Secure Location**	Transfer the backed up image saved in the previous step to a secure location where the Server Backup files are fetched in case of system disaster recovery.
6. ☐	**Backup Active SOAM**	Repeat **Steps 2 through 5** to back up the Active SOAM.
THIS PROCEDURE HAS BEEN COMPLETED		

Appendix B. Inhibit A and B Level Replication on C-Level Servers

Procedure 13: Inhibit A and B Level Replication on C-Level Servers

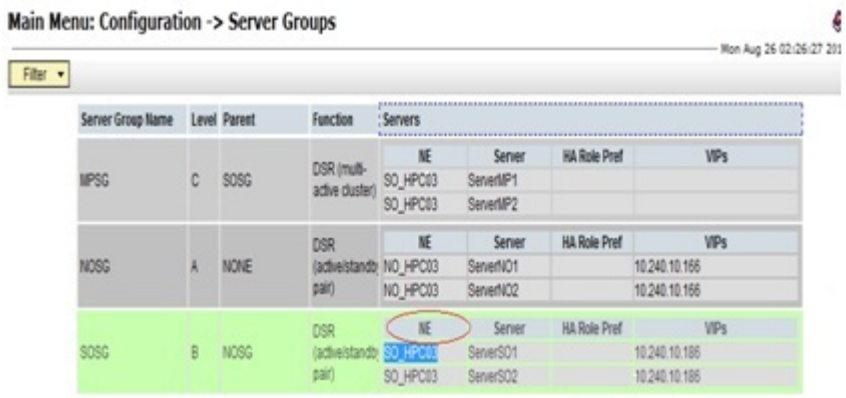
S T E P #		
	The intent of this procedure is to inhibit A and B level replication on all C Level servers of this site Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Active NOAMP:** Login	Login to the Active NOAMP server via SSH as ***admusr*** user.
2. ☐	**Active NOAMP:** Inhibit replication on all MP servers	Execute the following command: `$ for i in $(iqt -p -z -h -fhostName NodeInfo where "nodeId like 'C*' and siteId='<NE name of the site>'"); do iset -finhibitRepPlans='A B' NodeInfo where "nodeName='$i'"; done` **Note:** NE name of the site can be found out by logging into the Active NOAMP GUI and going to **Configuration → Server Groups** screen. Please see the snapshot below for more details. E.g. if ServerSO1 belong to the site which is being recovered then siteId will be SO_HPC03. 

Procedure 13: Inhibit A and B Level Replication on C-Level Servers

3 ☐	**Active NOAMP:** Verify Replication has been Inhibited.	After executing above steps to inhibit replication on MP(s), no alarms on GUI would be raised informing that replication on MP is disabled. Verification of replication inhibition on MPs can be done by analyzing NodeInfo output. InhibitRepPlans field for all the MP servers for the selected site e.g. Site SO_HPC03 shall be set as 'A B': Perform the following command: **`$ sudo iqt NodeInfo`** Expected output: nodeId nodeName hostName nodeCapability inhibitRepPlans siteId excludeTables A1386.099 NO1 NO1 Active NO_HPC03 B1754.109 SO1 SO1 Active SO_HPC03 C2254.131 MP2 MP2 Active A B SO_HPC03 C2254.233 MP1 MP1 Active A B SO_HPC03
THIS PROCEDURE HAS BEEN COMPLETED		

Appendix C. Un-Inhibit A and B Level Replication on C-Level Servers

Procedure 14: Un-Inhibit A and B Level Replication on C-Level Servers

S T E P #		
	The intent of this procedure is to Un-inhibit A and B level replication on all C Level servers of this site Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact **My Oracle Support (MOS)**, and ask for assistance.	
1. ☐	**Active NOAMP:** Login	Login to the Active NOAMP server via SSH as ***admusr*** user.
2. ☐	**Active NOAMP:** Un-Inhibit replication on all C level Servers	Execute the following command: `$ for i in $(iqt -p -z -h -fhostName NodeInfo where "nodeId like 'C*' and siteId='<NE name of the site>'"); do iset -finhibitRepPlans='' NodeInfo where "nodeName='$i'"; done` **Note:** NE name of the site can be found out by logging into the Active NOAMP GUI and going to **Configuration → Server Groups** screen. Please see the snapshot below for more details. E.g. if ServerSO1 belong to the site which is being recovered then siteId will be SO_HPC03. 

Procedure 14: Un-Inhibit A and B Level Replication on C-Level Servers

3. ☐	**Active NOAMP:** Verify Replication has been Inhibited.	After executing above steps to un-inhibit replication on MP(s), no alarms on GUI would be raised informing that replication on MP is disabled. Verification of replication un-inhibition on MPs can be done by analyzing NodeInfo output. InhibitRepPlans field for all the MP servers for the selected site e.g. Site SO_HPC03 shall be set as 'A B': Perform the following command: `$ sudo iqt NodeInfo` Expected output: nodeId nodeName hostName nodeCapability inhibitRepPlans siteId excludeTables A1386.099 NO1 NO1 Active NO_HPC03 B1754.109 SO1 SO1 Active SO_HPC03 C2254.131 MP2 MP2 Active SO_HPC03 C2254.233 MP1 MP1 Active SO_HPC03
THIS PROCEDURE HAS BEEN COMPLETED		

Appendix D. My Oracle Support (MOS)

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

Call the CAS main number at **1-800-223-1711** (toll-free in the US), or call the Oracle Support hotline for your local country from the list at *http://www.oracle.com/us/support/contact/index.html*. When calling, make the selections in the sequence shown below on the Support telephone menu:
Select **2** for New Service Request
Select **3** for Hardware, Networking and Solaris Operating System Support
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 will be 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.

Appendix E. Locate Product Documentation on the Oracle Help Center Site

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

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