Oracle Communications Diameter Signaling Router, DSR Cloud Disaster Recovery Guide

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See more information on MOS in Appendix E. My Oracle Support (MOS).
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1. Introduction

1.1 Purpose and Scope

This document describes how to execute disaster recovery for DSR (3-tier deployments). This includes recovery of partial or a complete loss of one or more DSR servers. The audience for this document includes GPS groups such as Software Engineering, Product Verification, Documentation, and Customer Service including Software Operations and First Office Application. This document can also be executed by Oracle customers as long as Oracle Customer Service personnel are involved and/or consulted. This document provides step-by-step instructions to execute disaster recovery for DSR. Executing this procedure also involves referring to and executing procedures in existing support documents.

*Note:* Components dependent on DSR might also need to be recovered, for example SDS and IDIH.

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

1.2 References


1.3 Acronyms

An alphabetized list of acronyms used in the document.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS</td>
<td>Basic Input Output System</td>
</tr>
<tr>
<td>CD</td>
<td>Compact Disk</td>
</tr>
<tr>
<td>DR</td>
<td>Disaster Recovery</td>
</tr>
<tr>
<td>DSR</td>
<td>Diameter Signaling Router</td>
</tr>
<tr>
<td>ESXi</td>
<td>Elastic Sky X Integrated</td>
</tr>
<tr>
<td>FABR</td>
<td>Full Address Based Resolution</td>
</tr>
<tr>
<td>iDIH</td>
<td>Integrated Diameter Intelligence Hub</td>
</tr>
<tr>
<td>IPFE</td>
<td>IP Front End</td>
</tr>
<tr>
<td>IWF</td>
<td>Inter Working Function</td>
</tr>
<tr>
<td>NAPD</td>
<td>Network Architecture Planning Diagram</td>
</tr>
<tr>
<td>NOAM</td>
<td>Network Operations, Administration &amp; Maintenance</td>
</tr>
<tr>
<td>OS</td>
<td>Operating System</td>
</tr>
<tr>
<td>OVA</td>
<td>Open Virtualization Appliance</td>
</tr>
<tr>
<td>OVM-M</td>
<td>Oracle Virtual Machine Manager</td>
</tr>
<tr>
<td>OVM-S</td>
<td>Oracle Virtual Machine Server</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>PDRA</td>
<td>Policy Diameter Routing Agent</td>
</tr>
<tr>
<td>PCA</td>
<td>Policy and Charging Application</td>
</tr>
<tr>
<td>RBAR</td>
<td>Range Based Address Resolution</td>
</tr>
<tr>
<td>SAN</td>
<td>Storage Area Network</td>
</tr>
<tr>
<td>SFTP</td>
<td>Secure File Transfer Protocol</td>
</tr>
<tr>
<td>SNMP</td>
<td>Simple Network Management Protocol</td>
</tr>
<tr>
<td>SOAM</td>
<td>Systems Operations, Administration &amp; Maintenance</td>
</tr>
<tr>
<td>TPD</td>
<td>Tekelec Platform Distribution</td>
</tr>
<tr>
<td>VM</td>
<td>Virtual Machine</td>
</tr>
</tbody>
</table>

1.4 Terminology

Table 2. Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base software</td>
<td>Base software includes deploying the VM image.</td>
</tr>
<tr>
<td>Failed server</td>
<td>A failed server in disaster recovery context refers to a VM 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-install the software.</td>
</tr>
<tr>
<td>Software Centric</td>
<td>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 or hardware firmware, and is not responsible for hardware installation, configuration, or maintenance.</td>
</tr>
<tr>
<td>Enablement</td>
<td>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.</td>
</tr>
</tbody>
</table>

1.5 Optional Features

Further configuration and/or installation steps need to be taken for optional features that may be present in this deployment. Refer to these documents for disaster recovery steps needed for their components.

Table 3. Optional Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter Mediation</td>
<td>DSR Meta Administration Feature Activation Procedure, E58661</td>
</tr>
<tr>
<td>Full Address Based Resolution (FABR)</td>
<td>DSR FABR Feature Activation Procedure, E78925</td>
</tr>
<tr>
<td>Range Based Address Resolution (RBAR)</td>
<td>DSR RBAR Feature Activation Procedure, E78926</td>
</tr>
<tr>
<td>Map-Diameter Interworking (MAP-IWF)</td>
<td>DSR MAP-Diameter IWF Feature Activation Procedure, E78927</td>
</tr>
<tr>
<td>Policy and Charging Application (PCA)</td>
<td>DSR PCA Activation Procedure, E81528</td>
</tr>
<tr>
<td>Host Intrusion Detection System (HIDS)</td>
<td>DSR Security Guide, E76974-01, Section 3.2</td>
</tr>
</tbody>
</table>
2. General Description

The DSR disaster recovery procedure falls into five basic categories. It is primarily dependent on the state of the NOAM servers and SOAM servers.

<table>
<thead>
<tr>
<th>Category</th>
<th>State of Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery of the entire network from a total outage</td>
<td>• All NOAM servers failed</td>
</tr>
<tr>
<td>[Recovery Scenario 1 (Complete Server Outage)]</td>
<td>• All SOAM servers failed</td>
</tr>
<tr>
<td></td>
<td>• 1 or more MP servers failed</td>
</tr>
<tr>
<td>Recovery of one or more servers with at least one NOAM server intact</td>
<td>• 1 or more NOAM servers intact</td>
</tr>
<tr>
<td>[Recovery Scenario 2 (Partial Server Outage with One NOAM Server Intact and Both SOAMs Failed)]</td>
<td>• 1 or more SOAM or MP servers failed</td>
</tr>
<tr>
<td>Recovery of the NOAM pair with one or more SOAM servers intact</td>
<td>• All NOAM servers failed</td>
</tr>
<tr>
<td>[Recovery Scenario 3 (Partial Server Outage with all NOAM Servers Failed and One SOAM Server Intact)]</td>
<td>• 1 or more SOAM servers intact</td>
</tr>
<tr>
<td>Recovery of one or more server with at least one NOAM and one SOAM server intact.</td>
<td>• 1 or more NOAM servers intact</td>
</tr>
<tr>
<td>[Recovery Scenario 4 (Partial Server Outage with one NOAM Server and One SOAM Server Intact)]</td>
<td>• 1 or more SOAM servers intact</td>
</tr>
<tr>
<td></td>
<td>• 1 SOAM or 1 or more MP servers failed</td>
</tr>
<tr>
<td>Recovery of the NOAM pair with DR-NOAM available and one or more SOAM servers intact</td>
<td>• All NOAM servers failed</td>
</tr>
<tr>
<td>[Recovery Scenario 5 (Partial Server Outage with all NOAM servers failed with DR-NOAM available)]</td>
<td>• 1 or more SOAM servers intact</td>
</tr>
<tr>
<td></td>
<td>• DR-NOAM available</td>
</tr>
<tr>
<td>Recovery of one or more server with corrupt databases that cannot be restored via replication from the active parent node.</td>
<td></td>
</tr>
</tbody>
</table>

2.1 Complete Server Outage (All Servers) – Recovery Scenario 5.1.1

Scenario:
• All NOAM servers failed
• All SOAM servers failed
• 1 or more MP servers failed

This is the worst case scenario where all the servers in the network have suffered complete software failure. The servers are recovered using OVA images and then restoring database backups to the active NOAM and SOAM servers.

Database backups are taken from customer offsite backup storage locations (assuming these were performed and stored offsite before 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 Server Outage with one NOAM Server Intact and Both SOAMs Failed – Recovery Scenario 5.1.2

Scenario:
- 1 or more NOAM servers intact
- 1 or more SOAM or MP servers failed

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

2.3 Partial Server Outage with Both NOAM Servers Failed and One SOAM Server Intact – Recovery Scenario 5.1.3

Scenario:
- All NOAM servers failed
- 1 or more SOAM servers intact

Database is restored on the NOAM and replication recovers the database of the remaining servers.

2.4 Partial Server Outage with NOAM and One SOAM Server Intact – Recovery Scenario 5.1.4

Scenario:
- 1 or more NOAM servers intact
- 1 or more SOAM servers intact
- 1 SOAM or 1 or more MP servers failed

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

2.5 Partial Server Outage with both NOAM Servers Failed with DR-NOAM Available – Recovery Scenario 5.1.5

Scenario:
- All NOAM servers failed
- 1 or more SOAM servers intact
- DR-NOAM available

This case assumes a partial outage with both NOAM servers failed but a DR NOAM available. The DR NOAM is switched from secondary to primary then recovers the failed NOAM servers

2.6 Partial Service 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 active
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:

- A hardcopy of this document (E76332) and hardcopies of all documents in the reference list
- 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.
- DSR recent backup files: electronic backup file (preferred) or hardcopy of all DSR configuration and provisioning data.
- Latest network element report: Electronic file or hardcopy of Network Element report.
- The network element XML file used for the VMs initial configuration.

Note: For all disaster recovery scenarios, we assume the NOAM database backup and the SOAM database backup were performed around the same time, and 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 these basic steps:

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. Determine Recovery Scenario).
5. Execute appropriate recovery procedures (listed in Section 5).
Figure 1. Determine Recovery Scenario
4. 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 4. Recovery Scenarios 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 4. Recovery Scenarios

<table>
<thead>
<tr>
<th>Recovery Scenario</th>
<th>Failure Condition</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• All NOAM servers failed. • All SOAM servers failed. • MP servers may or may not be failed.</td>
<td>Section Recovery Scenario 1 (Complete Server Outage)</td>
</tr>
<tr>
<td>2</td>
<td>• At least 1 NOAM server is intact and available. • All SOAM servers failed. • MP servers may or may not be failed.</td>
<td>Section Recovery Scenario 2 (Partial Server Outage with One NOAM Server Intact and Both SOAMs Failed)</td>
</tr>
<tr>
<td>3</td>
<td>• All NOAM servers failed. • At least 1 SOAM server out of active, standby, spare is intact and available. • MP servers may or may not be failed.</td>
<td>Section Recovery Scenario 3 (Partial Server Outage with all NOAM Servers Failed and One SOAM Server Intact)</td>
</tr>
<tr>
<td>4</td>
<td>• At least 1 NOAM server is intact and available. • At least 1 SOAM server out of active, standby, spare is intact and available. • 1 or more MP servers have failed.</td>
<td>Section Recovery Scenario 4 (Partial Server Outage with one NOAM Server and One SOAM Server Intact)</td>
</tr>
<tr>
<td>5</td>
<td>• Both NOAM servers failed in Primary site • At least 1 SOAM server out of active, standby, spare is intact and available. • DR-NOAM is available</td>
<td>Section Recovery Scenario 5 (Partial Server Outage with all NOAM servers failed with DR-NOAM available)</td>
</tr>
<tr>
<td>6</td>
<td>• Server is intact • Database gets corrupted on the server • Latest Database backup of the corrupt server is present • Replication is inhibited (either manually or because of comcol upgrade barrier)</td>
<td>Section Recovery Scenario 6 (Database Recovery)</td>
</tr>
<tr>
<td>6: Case 1</td>
<td>• Server is intact • Database gets corrupted on the server • Replication is occurring to the server with corrupted database</td>
<td>Section Recovery Scenario 6: Case 1</td>
</tr>
<tr>
<td>6: Case 2</td>
<td>• Server is intact • Database gets corrupted on the server • Latest database backup of the corrupt server is NOT present • Replication is inhibited (either manually or because of comcol upgrade barrier)</td>
<td>Section Recovery Scenario 6: Case 2</td>
</tr>
</tbody>
</table>
5. Disaster Recovery Procedure

Call Appendix E. My Oracle Support (MOS) before executing this procedure to ensure the proper recovery planning is performed.

Before disaster recovery, users must properly evaluate the outage scenario. This check ensures 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 Oracle Support prime. Based on Oracle Support’s assessment of the disaster, it may be necessary to deviate from the documented process.

5.1 Recovering and Restoring System Configuration

Disaster recovery requires configuring the system as it was before the disaster and restoration of operational information. There are eight (8) distinct procedures to choose from depending on the type of recovery needed. Only one of these should be followed (not all).

5.1.1 Recovery Scenario 1 (Complete Server Outage)

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

Database replication from the active NOAM server recovers 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 Procedure 1. The major activities are summarized as follows:

Recover base software for all VMs:
- Recover the virtual machines hosting the NOAMs and SOAMs
- Recover the active NOAM server by recovering the NOAMs base software
- Recover the NOAM database
- Reconfigure the application

Recover the standby NOAM server by recovering base software, for a non-HA deployment this can be skipped.
- Reconfigure the DSR application

Recover all SOAM and MP servers by recovering software. In a non-HA deployment the standby/spare SOAM servers can be skipped.
- Recover the SOAM database
- Reconfigure the DSR Application
- Reconfigure the signaling interface and routes on the MPs. The DSR software automatically reconfigures the signaling interface from the recovered database.

Restart process and re-enable provisioning replication.

Note: Any other applications DR recovery actions (SDS and IDIH) may occur in parallel. These actions can/should be worked simultaneously; doing so allows a faster recovery of the complete solution (i.e., stale DB on DP servers do not receive updates until SDS-SOAM servers are recovered.)
Procedure 1. Recovery Scenario 1

STEP # | Description
--- | ---
1. Workarounds | Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand/apply any workarounds required during this procedure.
2. Gather required materials | Gather the documents and required materials listed in Section 3.1 Required Materials.

For VMWare based deployments:
1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 2 (VMWare Only). Configure NOAM guests based on resource profile.
2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.
3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.

For KVM/OpenStack based deployments:
1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.
3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.

For OVM-S/OVM-M based deployments:
1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.
   - Procedure 8 (OVM-S/OVM-M Only). Configure NOAM guests based on...
## Procedure 1. Recovery Scenario 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>resource profile.</td>
<td></td>
</tr>
<tr>
<td>2. For SOAMs, execute the following procedures from reference [1]:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
<tr>
<td>3. For failed MPs, execute the following procedures from reference [1]:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
<tr>
<td>4.</td>
<td>Obtain latest database backup and network configuration data</td>
</tr>
<tr>
<td></td>
<td>Obtain the most recent database backup file from external backup sources (i.e., file servers) or tape backup sources.</td>
</tr>
<tr>
<td></td>
<td>From required materials list in Section 3.1 Required Materials, use the site survey documents and network element report (if available) to determine network configuration data.</td>
</tr>
<tr>
<td>5.</td>
<td>Execute DSR installation procedure for the first NOAM</td>
</tr>
<tr>
<td></td>
<td>Verify the networking data for network elements.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Use the backup copy of network configuration data and site surveys (Step 2).</td>
</tr>
<tr>
<td></td>
<td>Execute installation procedures for the first NOAM server from reference [1];</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>NOAM GUI: Login</td>
</tr>
<tr>
<td></td>
<td>Log into the NOAM GUI as the guiadmin user.</td>
</tr>
</tbody>
</table>

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Oracle System Login

Fri Aug 12 06:41:39 2016 EDT

Log In
Enter your username and password to log in

Session was logged out at 6:41:39 am.

Username: guiadmin
Password: [enter password]

[Change password] [Log In]
Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>NOAM GUI: Upload the backed up database file</td>
</tr>
</tbody>
</table>

Navigate to Main Menu->Status & Manage->Files.

- Select the active NOAM server.

Main Menu: Status & Manage -> Files

![Main Menu Screen]

Click **Upload** and select the **NO Provisioning and Configuration** file backed up after the initial installation and provisioning.

4. Click **Browse** and locate the backup file.
5. Mark the **This is a backup file** checkbox.
6. Click **Upload**.

The file takes a few seconds to upload depending on the size of the backup data. The file displays on the list of entries after the upload is complete.
Procedure 1. Recovery Scenario 1

8. NOAM GUI: Disable provisioning

Navigate to Main Menu->Status & Manage->Database.

- Click Disable Provisioning.
- Click OK on the confirmation screen.

The Warning Code 002 message displays.
**Procedure 1.  Recovery Scenario 1**

<table>
<thead>
<tr>
<th>9.</th>
<th><strong>NOAM GUI:</strong> Verify the archive contents and database compatibility</th>
</tr>
</thead>
</table>

Select the **active NOAM** server and click **Compare**.

Click the button for the restored database file uploaded as a part of Step 7 of this procedure.

**Verify** the output window matches the screen below.

**Note:** A database mismatch regarding the NodeIDs of the VMs is expected. If that is the only mismatch, proceed; otherwise, stop and contact Appendix E. My Oracle Support (MOS).

![Database Archive Compare](image)

**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 NOAM:

- **Topology Compatibility:**
  - THE TOPOLOGY SHOULD BE COMPATIBLE MINUS THE NODEID.

**Note:** We are trying to restore a backed up database onto an empty NOAM database. This is an expected text in Topology Compatibility.

If the verification is successful, click **Back**.
**Procedure 1.  Recovery Scenario 1**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td><strong>ACTIVE NOAM:</strong> Restore the database</td>
</tr>
</tbody>
</table>

Navigate to **Main Menu->Status & Manage->Database**.

Select the **active NOAM** server and click **Restore**.

Select the backup provisioning and configuration file.

![Select archive to Restore on server: Zombi](attachment:image1)

Click **OK**.

**Note:** A database mismatch regarding the NodeIDs of the servers is expected. If that is the only mismatch, proceed; otherwise, stop and contact Appendix E. My Oracle Support (MOS).

Mark the **Force** checkbox and click **OK** to proceed with the DB restore.

**Database Restore Confirm**

![Database Restore Confirm](attachment:image2)

**Note:** After the restore has started, the user is logged out of XMI NO GUI since the restored topology is old data.
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAM VIP GUI: Login</td>
<td>http://&lt;Primary_NOAM_VIP_IP_Address&gt;</td>
<td>Login as the guiadmin user.</td>
</tr>
</tbody>
</table>

**Oracle System Login**

![Oracle System Login](image)

Welcome to the Oracle System Login.

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Wait 5-10 minutes for the system to stabilize with the new topology. Monitor the Info tab for the Success message. This indicates the backup is complete and the system is stabilized. The following alarms must be ignored for NOAM and MP servers until all the servers are configured:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAM VIP GUI: Monitor and confirm database restoral</td>
<td></td>
<td>- Alarms with Type Column as REPL, COLL, HA (with mate NOAM), DB (about provisioning manually disabled).</td>
</tr>
</tbody>
</table>

**Note:** Do not pay attention to alarms until all the servers in the system are completely restored.

**Note:** The configuration and maintenance information is in the same state it was backed up during initial backup.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Log into the recovered active NOAM via SSH terminal as admusr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVE NOAM: Login</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Instructions</th>
</tr>
</thead>
</table>
| 14. | NOAM VIP GUI: Recover standby NOAM | Install the second NOAM server by executing procedures from reference [1].  
- Procedure 12 Configure the Second NOAM Server, Steps 1, 3-7  
- Procedure 13 Complete Configuring the NOAM Server Group, Step 4 |
| 15. | Active NOAM: Correct the recognizedAuth table | Establish an SSH session to the active NOAM, login as `admusr`.  
Execute the following command.  
```
$ sudo top.setPrimary
- Using my cluster: A1789
- Updating A1789.022: <DSR_NOAM_B_hostname>
- Updating A1789.144: <DSR_NOAM_A_hostname>
``` |
| 16. | NOAM VIP GUI: Restart DSR application | Navigate to `Main Menu->Status & Manage->Server`.  
Select the recovered standby NOAM server and click **Restart**.  

```
Stop  Restart  Reboot  NTP Sync  Report
``` |
| 17. | NOAM VIP GUI: Set HA on standby NOAM | Navigate to `Status & Manage -> HA`.  
Click **Edit**.  
Select the standby NOAM server and set it to **Active**.  
Click **OK**. |
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 18.  | **NOAM VIP GUI:** Perform Keyexchange with export server  
Navigate to **Main Menu -> Administration -> Remote Servers -> Data Export.**  
- Remote Servers  
- LDAP Authentication  
- SNMP Trapping  
- Data Export  
- DNS Configuration  
Click **SSH Key Exchange.**  
Enter the password and click **OK.** |
| 19.  | **NOAM VIP GUI:** Stop replication to the C-level servers of this site  
Inhibit replication to the working C-level servers, which belong to the same site as of the failed SOAM servers since the recovery of active SOAM causes 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 |
| 20.  | **NOAM VIP GUI:** Recover active SOAM server  
Install the SOAM servers by executing Procedure 19 **Configure the SOAM Servers, Steps 1, 3-7, from reference [1].**  
**Note:** Wait for server to reboot before continuing. |
| 21.  | **NOAM VIP GUI:** Restart DSR application on recovered active SOAM server  
Navigate to **Main Menu->Status & Manage->Server.**  
- Status & Manage  
  - Network Elements  
  - Server  
  - HA  
  - Database  
  - KPIs  
  - Processes  
  - Tasks  
  - Files  
Select the recovered server and click **Restart.** |
## Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>NOAM VIP GUI: Upload the backed up SOAM database file</td>
</tr>
</tbody>
</table>

- Navigate to **Main Menu->Status & Manage->Files**.
  - Select **SOAM database file**
  - Click **Upload** and select the **SO Provisioning and Configuration** file backed up after initial installation and provisioning.

1. Click **Browse** and locate the backup file.
2. Mark the **This is a backup file** checkbox.
3. Click **Upload**.

The file takes a few seconds to upload depending on the size of the backup data. The file displays on the list of entries after the upload is complete.
## Procedure 1. Recovery Scenario 1

### 23. Recovered SOAM GUI: 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.

![Oracle System Login](image)

Log In
Enter your username and password to log in

Session was logged out at 6:41:39 am.

Username: `guiadmin`

Password: 

- [ ] Change password

[Log In]

Welcome to the Oracle System Login.

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### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.</td>
<td><strong>Recovered SOAM GUI:</strong> Verify the archive contents and database compatibility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigate to</td>
<td><strong>Main Menu-&gt;Status &amp; Manage-&gt;Database.</strong> Select the active SOAM server and click <strong>Compare</strong>.</td>
</tr>
<tr>
<td>Click</td>
<td>the button for the restored database file uploaded as a part of Step 22 of this procedure.</td>
</tr>
<tr>
<td>Verify</td>
<td>the output window matches the screen below.</td>
</tr>
<tr>
<td>Note</td>
<td>A database mismatch regarding the NodeIDs of the VMs is expected. If that is the only mismatch, proceed; otherwise, stop and contact Appendix E. My Oracle Support (MOS).</td>
</tr>
</tbody>
</table>

**Database Archive Compare**

- **The selected database came from ZombieSOAM1 on 10/12/2022.**
- **Archive Contents:** Configuration data
- **Database Compatibility:** The databases are compatible.

**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**.
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td></td>
<td><strong>Recovered SOAM GUI: Restore the database</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Navigate to <strong>Main Menu-&gt;Status &amp; Manage-&gt;Database</strong>. Select the <strong>active SOAM</strong> server and click <strong>Restore</strong>. Select the proper back up provisioning and configuration file.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Database Restore Confirm" /> Click <strong>OK</strong>. <strong>Note:</strong> An error that the NodeIDs do not match is expected. If no other errors beside the NodeIDs are displayed, mark the <strong>Force</strong> checkbox and click <strong>OK</strong> to proceed with the DB restore. <strong>Note:</strong> After the restore has started, the user is logged out of XMI SOAM GUI since the restored topology is old data.</td>
</tr>
<tr>
<td>26.</td>
<td></td>
<td><strong>Recovered SOAM GUI: Monitor and confirm database restoral</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wait <strong>5-10 minutes</strong> for the system to stabilize with the new topology. Monitor the Info tab for the <strong>Success</strong> message. This indicates the backup is complete and the system is stabilized. <strong>Note:</strong> Do not pay attention to alarms until all the servers in the system are completely restored. <strong>Note:</strong> The configuration and maintenance information is in the same state it was backed up during initial backup.</td>
</tr>
</tbody>
</table>
Procedure 1. Recovery Scenario 1

27. **NOAM VIP GUI: Login**
   
   Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of: `http://<Primary_NOAM_VIP_IP_Address>`

   Login as the `guiadmin` user.

   **Oracle System Login**

   ![Oracle System Login screenshot]

   Welcome to the Oracle System Login.

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28. **NOAM VIP GUI: Recover remaining SOAM server**
   
   Install the SOAM servers by executing Procedure 19 **Configure the SOAM Servers**, Steps 1, 3-6, from reference [1].

   **Note:** Wait for server to reboot before continuing.
Procedure 1.  Recovery Scenario 1

29. NOAM VIP GUI: Restart DSR application on remaining SOAM server(s)

   Navigate to Main Menu->Status & Manage->Server.

   - Status & Manage
     - Network Elements
     - Server
     - HA
     - Database
     - KPIs
     - Processes
     - Tasks
     - Files

   Select the recovered server and click Restart.

30. NOAM VIP GUI: Set HA on recovered standby SOAM server

   Note: For non-HA sites, SKIP this step.

   Navigate to Status & Manage -> HA.

   - Status & Manage
     - Network Elements
     - Server
     - HA
     - Database
     - KPIs
     - Processes
     - Tasks
     - Files

   Click Edit.
   Set Max Allowed HA Role to Active.
   Click OK.
Procedure 1. Recovery Scenario 1

31. **NOAM VIP GUI**: Start replication on working C-level servers

Un-Inhibit (Start) Replication to the **working** C-level 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 **Allow Replication** using the following order; otherwise, if none of the servers are inhibited, skip this step and continue with the next step:

- Active NOAM server
- Standby NOAM server
- Active SOAM server
- Standby SOAM server
- Spare SOAM server (if applicable)
- MP/IPFE servers (if MPs are configured as active/standby, start with the active MP, otherwise the order of the MPs does not matter)
- SBRS (if SBR servers are configured, start with the active SBR, then standby, then spare)

Verify the replication on all the working servers is **Allowed**. This can be done by examining the Repl Status table.

<table>
<thead>
<tr>
<th>OAM Repl Status</th>
<th>SIG Repl Status</th>
<th>Repl Status</th>
<th>Repl Audit Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NotApplicable</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
</tbody>
</table>

32. **NOAM VIP GUI**: Recover the C-level server (DA-MP, SBRs, IPFE, SS7-MP)

Establish an SSH session to the C-level server being recovered, login as admusr.

Execute following command to set shared memory to unlimited.

```
$ sudo shl.set -m 0
```

Execute Procedure 22 Configure the MP Virtual Machines, Steps 1, 4-11, from [1] FOR EACH recovered server.
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Actions</th>
</tr>
</thead>
</table>
| 33.  | NOAM VIP GUI: Restart DSR application for recovered C-level Server | Navigate to **Main Menu->Status & Manage->Server**.  
Select the recovered server and click **Restart**. |
| 34.  | NOAM VIP GUI: Start replication on all C-level servers | Un-Inhibit (Start) Replication to the **ALL** C-level servers.  
Navigate to **Status & Manage -> Database**.  
If the Repl Status is set to **Inhibited**, click **Allow Replication** using the following order:  
- Active NOAM server  
- Standby NOAM server  
- Active SOAM server  
- Standby SOAM server  
- Spare SOAM server (if applicable)  
- MP/IPFE servers (if MPs are configured as active/standby, start with the active MP, otherwise, the order of the MPs does not matter)  
Verify the replication on all the working servers is **Allowed**. This can be done by examining the Repl Status table. |

<table>
<thead>
<tr>
<th>OAM Repl Status</th>
<th>SIG Repl Status</th>
<th>Repl Status</th>
<th>Repl Audit Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NotApplicable</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
</tbody>
</table>
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Instructions</th>
</tr>
</thead>
</table>
| 35.  | **NOAM VIP GUI:** Set HA on all C-level servers | Navigate to **Status & Manage -> HA.**
- **Status & Manage**
  - **Network Elements**
  - **Server**
  - **HA**
  - **Database**
  - **KPIs**
  - **Processes**
  - **Tasks**
  - **Files**
- Click **Edit.**
- For each server whose Max Allowed HA Role is set to OOS, set it to **Active.**
- Click **OK.** |
| 36.  | **ACTIVE NOAM:** Perform key exchange between the active-NOAM and recovered servers | Establish an SSH session to the Active NOAM, login as **admusr.**
- Execute the following command to perform a keyexchange from the active NOAM to each recovered server.
  ```bash
  $ keyexchange admusr@<Recovered Server Hostname>
  ```
- **Note:** If an export server is configured, perform this step. |
| 37.  | **ACTIVE NOAM:** Activate optional features | Establish an SSH session to the active NOAM, login as **admusr.**
- **Note for PCA Feature Activation:**
  If you have PCA installed in the system being recovered, execute the **PCA Activation on Standby NOAM Server** procedure on the recovered standby NOAM server and the **PCA Activation on Active SOAM Server** procedure on the recovered active SOAM server from [3] to re-activate PCA.
  - Refer to Section 1.5 Optional Features to activate any features that were previously activated.
  - **Note:** While running the activation script, the following error message (and corresponding messages) output may display. This can safely be ignored.
    ```
    iload#31000{S/W Fault}
    ```
  - **Note:** If any of the MPs have failed and recovered, then these MP servers should be restarted after activation of the feature.
  - Refer to Section 1.5 Optional Features to activate any features that were previously activated. |
Procedure 1. Recovery Scenario 1

38. **NOAM VIP GUI:**
   - Fetch and store the database report for the newly restored data and save it.
   - Navigate to Main Menu->Status & Manage->Database.
     - Select the active NOAM server and click Report.
     - Click Save to save the report to your local machine.

39. **ACTIVE NOAM:**
   - Verify replication between servers.
   - Log into the Active NOAM via SSH terminal as **admusr**.
   - Execute the following command:
     ```
     $ sudo irepstat -m
     ```
   - Output like this is 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
     ```
**Procedure 1. Recovery Scenario 1**

40. **NOAM VIP GUI:** Verify the database states

   Click on **Main Menu->Status and Manager->Database.**

   - Status & Manage
     - Network Elements
     - Server
     - HA
     - Database
     - KPIs
     - Processes
     - Tasks
     - Files

   Verify the OAM Max HA Role is either **Active** or **Standby** for NOAM and SOAM; Application Max HA Role for MPs is **Active**; and the status is **Normal**.

41. **NOAM VIP GUI:** Verify the HA status

   Navigate to **Main Menu->Status and Manage->HA.**

   - Status & Manage
     - Network Elements
     - Server
     - HA
     - Database
     - KPIs
     - Processes
     - Tasks
     - Files

   Select the row for all of the servers.

   Verify the HA Role is either **Active** or **Standby**.
## Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 42.  | **NOAM GUI:** Enable provisioning  
Navigate to `Main Menu->Status & Manage->Database`.  
- Navigate to `Status & Manage`  
  - Navigate to `Network Elements`  
  - Navigate to `Server`  
  - Navigate to `HA`  
  - Enable `Database`  
  - Navigate to `KPIs`  
  - Navigate to `Processes`  
  - Navigate to `Tasks`  
  - Navigate to `Files`  
- Click `Enable Provisioning`.  
- Click `OK` to enable provisioning. |
| 43.  | **SOAM VIP GUI:** Verify the local node info  
Navigate to `Main Menu->Diameter->Configuration->Local Node`.  
- Navigate to `Diameter`  
  - Navigate to `Configuration`  
  - Navigate to `Capacity Summary`  
  - Navigate to `Connection Capacity Dashboard`  
  - Navigate to `Application IDs`  
  - Navigate to `CEX Parameters`  
  - Navigate to `Command Codes`  
  - Navigate to `Configuration Sets`  
  - Navigate to `Local Nodes`  
  - Navigate to `Peer Nodes`  
  - Navigate to `Peer Node Groups`  
  - Navigate to `Connections`  
  - Navigate to `Route Groups`  
  - Navigate to `Route Lists`  
  - Navigate to `Peer Route Tables`  
  - Navigate to `Egress Throttle Groups`  
  - Navigate to `Reroute On Answer`  
  - Navigate to `Application Route Tables`  
  - Navigate to `Routing Option Sets`  
  - Navigate to `Pending Answer Timers`  
  - Navigate to `Traffic Throttle Points`  
  - Navigate to `Traffic Throttle Groups`  
  - Navigate to `A/P Removal Lists`  
  - Navigate to `System Options`  
  - Navigate to `DNS Options`  
- Verify all the local nodes are shown. |
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>44.</td>
<td>SOAM VIP GUI: Verify the peer node info</td>
<td>Navigate to <strong>Main Menu-&gt;Diameter-&gt;Configuration-&gt;Peer Node.</strong>&lt;br&gt;Verify all the peer nodes are shown.</td>
</tr>
<tr>
<td>45.</td>
<td>SOAM VIP GUI: Verify the connections info</td>
<td>Navigate to <strong>Main Menu-&gt;Diameter-&gt;Configuration-&gt;Connections.</strong>&lt;br&gt;Verify all the connections are shown.</td>
</tr>
<tr>
<td>46.</td>
<td>MP Servers: Disable SCTP Auth Flag</td>
<td>For SCTP connections without DTLS enabled, refer to Enable/Disable DTLS Appendix from reference [1].&lt;br&gt;Execute this procedure on all failed MP servers.</td>
</tr>
</tbody>
</table>
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 47.  | **SOAM VIP GUI:** Enable connections, if needed  
Navigate to **Main Menu->Diameter->Maintenance->Connections.**  
Select each connection and click **Enable**. Alternatively, you can enable all the connections by clicking **EnableAll**.  
Verify the Operational State is **Available**.  
*Note:* If a disaster recovery was performed on an IPFE server, it may be necessary to disable and re-enable the connections to ensure proper link distribution. |
| 48.  | **SOAM VIP GUI:** Enable optional features  
Navigate to **Main Menu -> Diameter -> Maintenance -> Applications.**  
Select the optional feature application already configured.  
Click **Enable**. |
| 49.  | **SOAM VIP GUI:** Re-enable transports, if needed  
[Applicable when MAP-IWF application is activated]  
Navigate to **Main Menu->Transport Manager -> Maintenance -> Transport.**  
Select each transport and click **Enable**.  
Verify the Operational Status for each transport is **Up**. |
### Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 50. | **SOAM VIP GUI:** Re-enable MAPIWF application, if needed [applicable when MAP-IWF application is activated]  
Navigate to **Main Menu->SS7/Sigtran->Maintenance->Local SCCP Users.**  
- SS7/Sigtran  
  - Configuration  
  - Maintenance  
    - Local SCCP Users  
    - Remote Signaling Poi  
    - Remote MTP3 Users  
    - Linksets  
    - Links  
  - Links  
Click **Enable** corresponding to MAPIWF Application Name.  
Enable | Disable  
Verify the SSN Status is **Enabled.** |
| 51. | **SOAM VIP GUI:** Re-enable links, if needed [applicable when MAP-IWF application is activated]  
Navigate to **Main Menu->SS7/Sigtran->Maintenance->Links.**  
- SS7/Sigtran  
  - Configuration  
  - Maintenance  
    - Local SCCP Users  
    - Remote Signaling Poi  
    - Remote MTP3 Users  
    - Linksets  
    - Links  
  - Links  
Click **Enable** for each link.  
Enable | Disable  
Verify that the Operational Status for each link is **Up.** |
| 52. | **SOAM VIP GUI:** Examine all alarms  
Navigate to **Main Menu->Alarms & Events->View Active.**  
- Alarms & Events  
  - View Active  
  - View History  
  - View Trap Log  
Examine all active alarms and refer to the on-line help on how to address them.  
If needed, contact Appendix E. My Oracle Support (MOS). |
Procedure 1. Recovery Scenario 1

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>53.</td>
<td><strong>NOAM VIP GUI:</strong></td>
<td>Log into the NOAM VIP if not already logged in.</td>
</tr>
<tr>
<td></td>
<td>Examine all alarms</td>
<td>Navigate to <strong>Main Menu-&gt;Alarms &amp; Events-&gt;View Active.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>File:</strong> Alarms &amp; Events</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>File:</strong> View Active</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>File:</strong> View History</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>File:</strong> View Trap Log</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Examine all active alarms and refer to the on-line help on how to address them.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If needed, contact Appendix E. My Oracle Support (MOS).</td>
</tr>
<tr>
<td>54.</td>
<td>Restore GUI usernames and passwords</td>
<td>If applicable, execute steps in Section 6 to recover the user and group information restored.</td>
</tr>
<tr>
<td>55.</td>
<td>Backup and archive all the databases from the recovered system</td>
<td>Execute Appendix A. DSR Database Backup to back up the configuration databases.</td>
</tr>
</tbody>
</table>

5.1.2 Recovery Scenario 2 (Partial Server Outage with One NOAM Server Intact and Both SOAMs Failed)

For a partial server outage with an NOAM 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 NOAM server recovers 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. Recovery Scenario 2. The major activities are summarized as follows:

- Recover **Standby NOAM** 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

<table>
<thead>
<tr>
<th>STEP</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Workarounds</td>
</tr>
<tr>
<td></td>
<td>Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand any workarounds required during this procedure.</td>
</tr>
<tr>
<td>2.</td>
<td>Gather required materials</td>
</tr>
<tr>
<td></td>
<td>Gather the documents and required materials listed in Section 3.1 Required Materials.</td>
</tr>
<tr>
<td>3.</td>
<td>NOAM VIP GUI: Login</td>
</tr>
<tr>
<td></td>
<td>Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:</td>
</tr>
<tr>
<td></td>
<td><code>http://&lt;Primary_NOAM_VIP_IP_Address&gt;</code></td>
</tr>
<tr>
<td></td>
<td>Login as the <code>guiadmin</code> user.</td>
</tr>
</tbody>
</table>

![Login Screen](image)
**Procedure 2. Recovery Scenario 2**

4. **Active NOAM:**
   Set failed servers to OOS  
   
   Navigate to **Main Menu -> Status & Manage -> HA.**
   
   ![Screenshot of Main Menu]
   
   Click **Edit.**
   
   Set the Max Allowed HA Role option to **OOS** for the failed servers.
   
   Click **OK.**

5. **Create VMs and recover the failed software**

   **For VMWare based deployments:**
   
   1. For NOAMs, execute the following procedures from reference [1]:
      
      - Procedure 1 (VMware). Import DSR OVA.
   
   2. For SOAMs, execute the following procedures from reference [1]:
      
      - Procedure 1 (VMware). Import DSR OVA.
      - Procedure 3 (VMware Only). Configure Remaining DSR guests based on resource profile.

   **For KVM/OpenStack based deployments:**
   
   1. For NOAMs, execute the following procedures from reference [1]:
      
      - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   
   2. For SOAMs, execute the following procedures from reference [1]:
      
      - Procedure 4 (KVM/OpenStack). Import DSR OVA.
      - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.

   **For OVM-S/OVM-M based deployments:**
   
   4. For NOAMs, execute the following procedures from reference [1]:
      
      - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.
   
   5. For SOAMs, execute the following procedures from reference [1]:
      
      - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.
## Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Repeat for remaining failed servers</td>
</tr>
</tbody>
</table>
| 7. | NOAM VIP GUI: Login | Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:  
   
   ![Oracle System Login](image)  
   
   Login as the `guiadmin` user. |
| 8. | NOAM VIP GUI: Recover standby NOAM | Install the second NOAM server by executing procedures from reference [1]:  
   - Procedure 12 Configure the Second NOAM Server, Steps 1, 3-7  
   - Procedure 13 Complete Configuring the NOAM Server Group, Step 4  
   **Note:** If topology or NodeID alarms are persistent after the database restore, refer to Appendix D. Workarounds for Issues Not Fixed in This Release or the next step. |
Procedure 2.   Recovery Scenario 2

9.  NOAM VIP GUI:  
Restart DSR application
Navigate to Main Menu->Status & Manage->Server.
Select the recovered standby NOAM server and click Restart.

10.  NOAM VIP GUI:  
Set HA on standby NOAM
Navigate to Status & Manage -> HA
Click Edit.
Select the standby NOAM server and set it to Active.
Click OK.

11.  NOAM VIP GUI:  
Stop replication to the C-level servers of this site
Inhibit replication to the working C-level servers, which belong to the same site as the failed SOAM servers since the recovery of active SOAM causes 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

12.  NOAM VIP GUI:  
Recovered active SOAM server
Install the SOAM servers by executing Procedure 19 Configure the SOAM Servers, Steps 1, 3- 6, from reference [1].

Note:  Wait for server to reboot before continuing.
### Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td><strong>NOAM VIP GUI:</strong> Set HA on active SOAM</td>
</tr>
<tr>
<td></td>
<td>Navigate to <strong>Status &amp; Manage -&gt; HA</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Status &amp; Manage</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Network Elements</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Server</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>HA</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Database</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>KPIs</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Processes</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Tasks</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>Files</strong></td>
</tr>
<tr>
<td></td>
<td>Click <strong>Edit</strong>.</td>
</tr>
<tr>
<td></td>
<td>Select the active SOAM server and set it to <strong>Active</strong>.</td>
</tr>
<tr>
<td></td>
<td>Click <strong>OK</strong>.</td>
</tr>
</tbody>
</table>

| 14.  | **NOAM VIP GUI:** Restart DSR application |
|      | Navigate to **Main Menu->Status & Manage->Server**. |
|      | - **Status & Manage** |
|      |   - **Network Elements** |
|      |   - **Server** |
|      |   - **HA** |
|      |   - **Database** |
|      |   - **KPIs** |
|      |   - **Processes** |
|      |   - **Tasks** |
|      |   - **Files** |
|      | Select the recovered active SOAM server and click **Restart**. |

---
Procedure 2. Recovery Scenario 2

15. **NOAM VIP GUI:**
   Upload the backed up SOAM database file

   Navigate to **Main Menu->Status & Manage->Files.**
   
   [Diagram of the interface]

   Select the **active SOAM server.**

   **Main Menu: Status & Manage -> Files**
   
   ![File List]
   
   Click **Upload** and select the **NO Provisioning and Configuration** file backed up after the initial installation and provisioning.
   
   1. Click **Browse** and locate the backup file.
   2. Mark the **This is a backup file** checkbox.
   3. Click **Upload.**

   ![Upload Dialog]

   The file takes a few seconds to upload depending on the size of the backup data. The file displays on the list of entries after the upload is complete.
### Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.</td>
<td><strong>Recovered SOAM GUI:</strong> Login</td>
</tr>
</tbody>
</table>

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.

---

**Oracle System Login**

Welcome to the Oracle System Login.

This application is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the [Oracle Software Web Browser Support Policy](#) for details.

Unauthorized access is prohibited.

Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.
### Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Recovered SOAM GUI: Verify the archive contents and database compatibility</td>
<td>Navigate to <strong>Main Menu-&gt;Status &amp; Manage-&gt;Database</strong>. Select the <strong>active SOAM</strong> server and click <strong>Compare</strong>. Click the button for the restored database file uploaded as a part of Step 15 of this procedure. Verify the output window matches the screen below. <strong>Note</strong>: A database mismatch regarding the NodeIDs of the VMs is expected. If that is the only mismatch, proceed; otherwise, stop and contact Appendix E. My Oracle Support (MOS). <strong>Note</strong>: Archive Contents and Database Compatibilities must be the following: <strong>Archive Contents</strong>: Configuration data <strong>Database Compatibility</strong>: The databases are compatible. <strong>Note</strong>: 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: <strong>Topology Compatibility</strong>: THE TOPOLOGY SHOULD BE COMPATIBLE MINUS THE NODEID. <strong>Note</strong>: 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 <strong>Back</strong>.</td>
</tr>
</tbody>
</table>
### Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 18. | **Recovered SOAM GUI: Restore the database**  
**Navigate to** Main Menu->Status & Manage->Database.  
Select the active SOAM server and click **Restore**.  
Select the proper back up provisioning and configuration file.  
**Click OK.**  
**Note:** A database mismatch regarding the NodeIDs of the servers is expected. If that is the only mismatch, proceed; otherwise, stop and contact Appendix E. My Oracle Support (MOS).  
Mark the **Force** checkbox and click **OK** to proceed with the DB restore. |
| 19. | **Recovered SOAM GUI:** Monitor and confirm database restoral  
**Wait 5-10 minutes** for the system to stabilize with the new topology.  
Monitor the Info tab for the **Success** message. This indicates 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 is in the same state it was backed up during initial backup. |
| 20. | **NOAM VIP GUI:** Recover remaining SOAM server  
Install the SOAM servers by executing Procedure 19 **Configure the SOAM Servers**, Steps 1, 3-6, from reference [1].  
**Note:** Wait for server to reboot before continuing. |
<table>
<thead>
<tr>
<th>Procedure 2. Recovery Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>21. NOAM VIP GUI:</strong>  Set HA on SOAM servers</td>
</tr>
<tr>
<td>Navigate to <strong>Status &amp; Manage -&gt; HA.</strong></td>
</tr>
<tr>
<td>- Click <strong>Edit.</strong></td>
</tr>
<tr>
<td>- For each SOAM server whose Max Allowed HA Role is set to Standby, set it to <strong>Active.</strong></td>
</tr>
<tr>
<td>- Click <strong>OK.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>22. Recovered Server:</strong>  Sync NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perform the following to retrieve the remote NTP server.</td>
</tr>
<tr>
<td>$ sudo ntpq -np</td>
</tr>
<tr>
<td><strong>Example output:</strong></td>
</tr>
<tr>
<td>[admusr@NOAM-2 ~]$ ntpq -np</td>
</tr>
<tr>
<td>remote</td>
</tr>
<tr>
<td>jitter</td>
</tr>
<tr>
<td>*10.240.9.186</td>
</tr>
<tr>
<td>2.434</td>
</tr>
<tr>
<td>2. Stop ntpd service.</td>
</tr>
<tr>
<td>$ sudo service ntpd stop</td>
</tr>
<tr>
<td>3. Sync the date to the ntp remote server.</td>
</tr>
<tr>
<td>$ sudo ntpdate &lt;NTP remote server&gt;</td>
</tr>
<tr>
<td><strong>Note:</strong>  The <strong>&lt;NTP remote server&gt;</strong> in the above ntpdate command is the one gathered in sub step 1.</td>
</tr>
<tr>
<td>4. Start the ntp service.</td>
</tr>
<tr>
<td>$ sudo service ntpd start</td>
</tr>
</tbody>
</table>
Procedure 2.  Recovery Scenario 2

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.</td>
<td><strong>NOAM VIP GUI:</strong> Restart DSR application</td>
</tr>
<tr>
<td></td>
<td>Navigate to Main Menu-&gt;Status &amp; Manage-&gt;Server. Select the recovered server and click <strong>Restart</strong>.</td>
</tr>
<tr>
<td>24.</td>
<td><strong>NOAM VIP GUI:</strong> Start replication on working C-level servers</td>
</tr>
<tr>
<td></td>
<td>Un-Inhibit (Start) replication to the <strong>working</strong> C-level servers, which belong to the same site as of the failed SOAM servers. Execute <strong>Appendix C. Un-Inhibit A and B Level Replication on C-Level Servers</strong>. Navigate to Main Menu-&gt;Status &amp; Manage-&gt;Database. If the Repl Status is set to <strong>Inhibited</strong>, click <strong>Allow Replication</strong> using the following order, otherwise if none of the servers are inhibited, skip this step and continue with the next step:</td>
</tr>
<tr>
<td></td>
<td>• Active NOAM Server</td>
</tr>
<tr>
<td></td>
<td>• Standby NOAM Server</td>
</tr>
<tr>
<td></td>
<td>• Active SOAM Server</td>
</tr>
<tr>
<td></td>
<td>• Standby SOAM Server</td>
</tr>
<tr>
<td></td>
<td>• Spare SOAM Server (if applicable)</td>
</tr>
<tr>
<td></td>
<td>• MP/IPFE Servers (if MPs are configured as active/standby, start with the active MP, otherwise the order of the MPs does not matter)</td>
</tr>
<tr>
<td></td>
<td>• SBRS (if SBR servers are configured, start with the active SBR, then standby, then spare)</td>
</tr>
<tr>
<td></td>
<td>Verify the replication on all the working servers is <strong>Allowed</strong>. This can be done by examining the Repl Status table.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OAM Repl Status</th>
<th>SIG Repl Status</th>
<th>Repl Status</th>
<th>Repl Audit Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NotApplicable</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
</tbody>
</table>
Procedure 2. Recovery Scenario 2

25. **NOAM VIP GUI:** Recover the C-level server (DA-MP, SBRs, IPFE, SS7-MP)

   Establish an SSH session to the C-level server being recovered, login as admusr.

   Execute following command to set shared memory to unlimited.

   ```
   $ sudo shl.set –m 0
   ```

   Execute Procedure 15 Configure the MP Virtual Machines, Steps 1, 4-11, from [1] FOR EACH recovered server.

26. **NOAM VIP GUI:** Start replication on ALL C-level Servers

   Un-Inhibit (Start) Replication to the ALL C-level servers.

   Navigate to Status & Manage -> Database.

   If the Repl Status is set to Inhibited, click Allow Replication using the following order:
   - Active NOAM Server
   - Standby NOAM Server
   - Active SOAM Server
   - Standby SOAM Server
   - Spare SOAM Server (if applicable)
   - MP/IPFE Servers (if MPs are configured as active/standby, start with the active MP, otherwise the order of the MPs does not matter)

   Verify the replication on all the working servers is Allowed. This can be done by examining the Repl Status table.

<table>
<thead>
<tr>
<th>OAM Repl Status</th>
<th>SIG Repl Status</th>
<th>Repl Status</th>
<th>Repl Audit Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NotApplicable</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
<tr>
<td>Normal</td>
<td>NotApplicable</td>
<td>Allowed</td>
<td>NotApplicable</td>
</tr>
</tbody>
</table>
## Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
<th>Instructions</th>
</tr>
</thead>
</table>
| 27.  | **NOAM VIP GUI:** Set HA on all C-level servers | Navigate to **Status & Manage -> HA.**  
  - Click **Edit.**  
  - For each server whose Max Allowed HA Role is set to Standby, set it to **Active.**  
  - Click **OK.**  
  - **ACTIVE NOAM:** Perform key exchange between the active-NOAM and recovered servers  
  - Establish an SSH session to the active NOAM, login as **admusr.**  
  - Execute the following command to perform a key exchange from the active NOAM to each recovered server.  
    ```bash  
    $ keyexchange admusr@<Recovered Server Hostname>  
    ```  
  - **Note:** If an export server is configured, perform this step.  
  - **ACTIVE NOAM:** Activate optional features  
  - Establish an SSH session to the active NOAM, login as **admusr.**  
  - **Note for PCA Feature Activation:** If you have PCA installed in the system being recovered, execute the **PCA Activation on Active NOAM Server** procedure on the recovered active NOAM Server, and the **PCA Activation on Stand By SOAM Server** procedure on the recovered standby SOAM from [3] to re-activate PCA.  
    - **Note:** While running the activation script, the following error message (and corresponding messages) output may display. This can safely be ignored.  
      ```bash  
      iload#31000{S/W Fault}  
      ```  
    - **Note:** If any of the MPs have failed and recovered, then these MP servers should be restarted after activation of the feature.  
    - Refer to Section 1.5 Optional Features to activate any features previously activated. |
Procedure 2. Recovery Scenario 2

30. **NOAM VIP GUI:** Fetch and store the database report for the newly restored data and save it

Navigate to **Main Menu->Status & Manage->Database.**

- Select the active NOAM server and click **Report.**

### Main Menu: Status & Manage -> Database [Report]

---

**NOAM Database Status Report**

Report Generated: Tue Oct 05 15:13:38 2010 UTC
From Active Network OAMF on host blade07
Report Version: 3.0.13-3.0.0_10.13.0
Status: pending

---

**General**

- Hostname: blade07
- Application Database Version: 3.0

**Capacity and Utilization**

- Disk Utilization: 0.4% 249M used of 400 total. 391M available
- Memory Utilization: 0.6% 138M used of 2396M total. 2258M available

**Aliases**

- None

**Maintenance in Progress**

- Restore operation success

**Service Information**

- Fast: A_ReqPro2nfart

<table>
<thead>
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<th>Space</th>
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<th>Max</th>
<th>Rows</th>
<th>Memory</th>
<th>Disk</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>CoFsAIO</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>CoFsAIO/csv</td>
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<td>64</td>
<td>64</td>
<td>64</td>
<td>64</td>
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<td>CoFsAIO/csv</td>
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</tr>
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<td>CoNs</td>
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<td>CoNs/csv</td>
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<td>CoNs/csv</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>CoNs/csv</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
</tr>
</tbody>
</table>

Click **Save** to save the report to your local machine.
31. **ACTIVE NOAM**: Verify replication between servers

Log into the active NOAM via SSH terminal as `admusr`.

Execute the following command:

```bash
$ sudo irepstat -m
```

Output like this is 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
```

32. **NOAM VIP GUI**: Verify the database states

Navigate to **Main Menu->Status and Manager->Database**.

Verify the OAM Max HA Role is either **Active** or **Standby** for NOAM and SOAM; Application Max HA Role for MPs is **Active**; and the status is **Normal**.
### Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Navigate to</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.</td>
<td><strong>NOAM VIP GUI:</strong> Verify the HA status</td>
<td><strong>Main Menu-&gt;Status and Manage-&gt;HA.</strong>&lt;br&gt;<strong>Select the row for all of the servers.</strong>&lt;br&gt;<strong>Verify the HA Role is either Active or Standby.</strong>&lt;br&gt;<img src="image.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>
| 34. | **SOAM VIP GUI:** Verify the local node info | **Main Menu->Diameter->Configuration->Local Node.**<br>**Verify all the local nodes are shown.**
### Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.</td>
<td><strong>SOAM VIP GUI:</strong> Verify the peer node info</td>
<td>Navigate to Main Menu-&gt;Diameter-&gt;Configuration-&gt;Peer Node. &lt;br&gt;Verify all the peer nodes are shown.</td>
</tr>
<tr>
<td>36.</td>
<td><strong>SOAM VIP GUI:</strong> Verify the connections info</td>
<td>Navigate to Main Menu-&gt;Diameter-&gt;Configuration-&gt;Connections. &lt;br&gt;Verify all the connections are shown.</td>
</tr>
<tr>
<td>37.</td>
<td><strong>MP Servers:</strong> Disable SCTP Auth Flag</td>
<td>For SCTP connections without DTLS enabled, refer to Enable/Disable DTLS Appendix from reference [1]. &lt;br&gt;Execute this procedure on all failed MP servers.</td>
</tr>
</tbody>
</table>
## Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 38. | **SOAM VIP GUI:** Enable Connections, if needed  
   Navigate to **Main Menu->Diameter->Maintenance->Connections.**  
   Select each connection and click **Enable.** Alternatively, you can enable all the connections by clicking **EnableAll.**  
   Verify the Operational State is **Available.** |
| 39. | **SOAM VIP GUI:** Enable Optional Features  
   Navigate to **Main Menu -> Diameter -> Maintenance -> Applications.**  
   Select the optional feature application configured in Step 29.  
   Click **Enable.** |
| 40. | **SOAM VIP GUI:** Re-enable transports, if needed  
   Navigate to **Main Menu->Transport Manager -> Maintenance -> Transport.**  
   Select each transport and click **Enable.**  
   Verify the Operational Status for each transport is **Up.** |
## Procedure 2. Recovery Scenario 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 41. | **SOAM VIP GUI:** Re-enable MAPIWF application, if needed  
Navigate to **Main Menu->SS7/Sigtran->Maintenance->Local SCCP Users.**  
- **SS7/Sigtran**  
- **Configuration**  
- **Maintenance**  
  - **Local SCCP Users**  
  - **Remote Signaling Poi**  
  - **Remote MTP3 Users**  
  - **Linksets**  
  - **Links**  
  
Click **Enable** corresponding to MAPIWF Application Name.  
|   | Enable | Disable |
| 42. | **SOAM VIP GUI:** Re-enable links, if needed  
Navigate to **Main Menu->SS7/Sigtran->Maintenance->Links.**  
- **SS7/Sigtran**  
- **Configuration**  
- **Maintenance**  
  - **Local SCCP Users**  
  - **Remote Signaling Poi**  
  - **Remote MTP3 Users**  
  - **Linksets**  
  - **Links**  
  
Click **Enable** for each link.  
|   | Enable | Disable |
| 43. | **SOAM VIP GUI:** Examine all alarms  
Navigate to **Main Menu->Alarms & Events->View Active.**  
- **Alarms & Events**  
  - **View Active**  
  - **View History**  
  - **View Trap Log**  
  
Examine all active alarms and refer to the on-line help on how to address them. If needed, contact Appendix E. My Oracle Support (MOS). |
Procedure 2. Recovery Scenario 2

44. **NOAM VIP GUI:** Examine all alarms

   Log into the NOAM 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 Appendix E. My Oracle Support (MOS).

45. **Backup and archive all the databases from the recovered system**

   Execute Appendix A. DSR Database Backup to back up the Configuration databases.

5.1.3 Recovery Scenario 3 (Partial Server Outage with all NOAM Servers Failed and One SOAM Server Intact)

For a partial server outage with an SOAM server intact and available; NOAM servers are recovered using recovery procedures for software and then executing a database restore to the active NOAM server using a NOAM 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 NOAM/active SOAM server recovers 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. Recovery Scenario 3. The major activities are summarized as follows:

- Recover **active NOAM** server by recovering software and the database.
  - Recover the software.
  - Recover the database

- Recover **Standby NOAM 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

<table>
<thead>
<tr>
<th>STEP #</th>
<th>Workarounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand any workarounds required during this procedure.</td>
</tr>
</tbody>
</table>
## Procedure 3. Recovery Scenario 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Gather required materials</td>
<td>Gather the documents and required materials listed in Section 3.1 Required Materials.</td>
</tr>
</tbody>
</table>
| 3.   | Recover the failed software | **For VMWare based deployments:**  
1. For NOAMs, execute the following procedures from reference [1]:  
   - Procedure 1 (VMWare). Import DSR OVA.  
   - Procedure 2 (VMWare Only). Configure NOAM guests based on resource profile.  
2. For SOAMs, execute the following procedures from reference [1]:  
   - Procedure 1 (VMWare). Import DSR OVA.  
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.  
3. For failed MPs, execute the following procedures from reference [1]:  
   - Procedure 1 (VMWare). Import DSR OVA.  
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.  

**For KVM/OpenStack based deployments:**  
1. For NOAMs, execute the following procedures from reference [1]:  
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.  
2. For SOAMs, execute the following procedures from reference [1]:  
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.  
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.  
3. For failed MPs, execute the following procedures from reference [1]:  
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.  
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.  

**For OVM-S/OVM-M based deployments:**  
1. For NOAMs, execute the following procedures from reference [1]:  
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.  
2. For SOAMs, execute the following procedures from reference [1]:  
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.  
3. For failed MPs, execute the following procedures from reference [1]:  
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.  
### Procedure 3. Recovery Scenario 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td><strong>Obtain latest database backup and network configuration data</strong>&lt;br&gt;Obtain the most recent database backup file from external backup sources (i.e., file servers) or tape backup sources.&lt;br&gt;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.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Execute DSR installation procedure for the first NOAM</strong>&lt;br&gt;Verify the networking data for network elements,&lt;br&gt;Note: Use the backup copy of network configuration data and site surveys (Step 2).&lt;br&gt;Execute installation procedures for the first NOAM server from reference [1]:&lt;br&gt;• Procedure 10 Configure the First NOAM NE and Server&lt;br&gt;• Procedure 11 Configure the NOAM Server Group</td>
</tr>
<tr>
<td>6.</td>
<td><strong>NOAM GUI: Login</strong>&lt;br&gt;Log into the NOAM GUI as the <strong>guiadmin</strong> user.</td>
</tr>
</tbody>
</table>

![Oracle System Login](image-url)
Procedure 3. Recovery Scenario 3

7. **NOAM GUI:** Upload the backed up database file

Navigate to **Main Menu->Status & Manage->Files.**

- Select the active NOAM server.

**Main Menu: Status & Manage -> Files**

1. Click **Browse** and locate the backup file.
2. Mark the **This is a backup file** checkbox.
3. Click **Upload.**

The file takes a few seconds to upload depending on the size of the backup data. The file displays on the list of entries after the upload is complete.
8. **NOAM GUI: Disable Provisioning**

Navigate to **Main Menu->Status & Manage->Database.**

- Click **Disable Provisioning.**
- Click **OK** on the confirmation screen to disable provisioning.

The **Warning Code 002** message displays.
**Procedure 3. Recovery Scenario 3**

9. **NOAM GUI:** Verify the archive contents and database compatibility

<table>
<thead>
<tr>
<th>Procedure 3. Recovery Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. NOAM GUI: Verify the archive contents and database compatibility</td>
</tr>
<tr>
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</tbody>
</table>
**Procedure 3. Recovery Scenario 3**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td><strong>ACTIVE NOAM:</strong> Restore the Database</td>
</tr>
</tbody>
</table>

Navigate to **Main Menu->Status & Manage->Database.**

Select the active NOAM server and click **Restore.**

Select the proper back up provisioning and configuration file.

Click **OK.**

**Note:** A database mismatch regarding the NodeIDs of the servers is expected. If that is the only mismatch, proceed; otherwise, stop and contact Appendix E. My Oracle Support (MOS).

Mark the **Force** checkbox and click **OK** to proceed with the DB restore.

**Note:** After the restore has started, the user is logged out of XMI NO GUI since the restored Topology is old data.
### Procedure 3. Recovery Scenario 3

#### 11. NOAM VIP GUI: Login

Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:

```
http://<Primary_NOAM_VIP_IP_Address>
```

Login as the **guiadmin** user.

![Oracle System Login](image)

**Note:** Do not pay attention to alarms until all the servers in the system are completely restored.

**Note:** The Configuration and Maintenance information is in the same state it was backed up during initial backup.

#### 12. NOAM VIP GUI: Monitor and confirm database restoration

Wait **5-10 minutes** for the system to stabilize with the new topology.

Monitor the Info tab for the **Success** message. This indicates the backup is complete and the system is stabilized.

Following alarms **must** be ignored for NOAM and MP Servers until all the Servers are configured:

- Alarms with Type Column as **REPL, COLL, HA** (with mate NOAM), **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 is in the same state it was backed up during initial backup.

#### 13. ACTIVE NOAM: Login

Log into the recovered active NOAM via SSH terminal as **admusr**.
### Procedure 3.  Recovery Scenario 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 14.  | **NOAM VIP GUI:** Re-enable provisioning  
   Navigate to `Main Menu->Status & Manage->Database`.  
   Click **Enable Provisioning**.  
   Click **OK** to confirm. |
| 15.  | **NOAM VIP GUI:** Install the second NOAM server by executing procedures from reference [1]:  
   - Procedure 12 Configure the Second NOAM Server, Steps 1, 3-7  
   - Procedure 13 Complete Configuring the NOAM Server Group, Step 4  
   **Note:** If Topology or NodeID alarms are persistent after the database restore, refer to Appendix D. Workarounds for Issues Not Fixed in This Release or the next step. |
| 16.  | **NOAM VIP GUI:** Recover remaining failed SOAM servers  
   Recover the remaining SOAM servers (standby, spare) by repeating the following step for each SOAM server:  
   1. Install the remaining SOAM servers by executing Procedure 19 **Configure the SOAM Servers**, Steps 1, 3-7, from reference [1].  
   **Note:** Wait for server to reboot before continuing. |
| 17.  | **NOAM VIP GUI:**  
   Navigate to `Main Menu->Status & Manage->Server`.  
   Select the recovered server and click **Restart**. |
## Procedure 3. Recovery Scenario 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 18.  | **NOAM VIP GUI:** Set HA on all C-level servers  
      Navigate to Status & Manage -> HA.  
      Click Edit.  
      For each server whose Max Allowed HA Role is not active, set it to Active.  
      Click OK.  |
| 19.  | **NOAM VIP GUI:** Restart DSR application  
      Navigate to Main Menu->Status & Manage->Server.  
      Select each recovered server and click Restart.  |
| 20.  | **ACTIVE NOAM:** Perform key exchange between the active-NOAM and recovered servers  
      Establish an SSH session to the active NOAM, login as admusr.  
      Execute the following command to perform a keyexchange from the active NOAM to each recovered server.  
      ```bash  
      $ keyexchange admusr@<Recovered Server Hostname>  
      ```  
      **Note:** If an export server is configured, perform this step.  |
Procedure 3. Recovery Scenario 3

21. **ACTIVE NOAM:**
   - Activate optional features

   Establish an SSH session to the active NOAM, login as `admusr`.

   **Note for PCA Feature Activation:**
   If you have PCA installed in the system being recovered, execute the **PCA Activation on Active NOAM Server** procedure on the recovered active NOAM server and the **PCA Activation on Standby SOAM Server** procedure on the recovered standby SOAM from [3] to re-activate PCA.

   **Note:** While running the activation script, the following error message (and corresponding messages) output may display. This can safely be ignored.

   ```
iload#31000{S/W Fault}
   ```

   **Note:** If any of the MPs have failed and recovered, then these MP servers should be restarted after activation of the feature.

   Refer to Section 1.5 Optional Features to activate any features previously activated.

22. **NOAM VIP GUI:**
   - Fetch and store the database report for the newly restored data and save it

   Navigate to **Main Menu->Status & Manage->Database**.

   Select the **active NOAM server** and click **Report**.

   ![Database Status Report](image)

   Click **Save** to save the report to your local machine.
Procedure 3. Recovery Scenario 3

23. **ACTIVE NOAM:** Verify replication between servers

Log into the active NOAM via SSH terminal as `admusr`.

Execute the following command.

```
$ sudo irepstat -m
```

Output like this is 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
```

24. **NOAM VIP GUI:** Verify the database states

Navigate to **Main Menu->Status and Manager->Database.**

Verify the OAM Max HA Role is either **Active** or **Standby** for NOAM and SOAM; Application Max HA Role for MPs is **Active**; and the status is **Normal.**
Procedure 3. Recovery Scenario 3

25. **NOAM VIP GUI**: Verify the HA status

Navigate to **Main Menu->Status and Manage->HA**.

- Status & Manage
- Network Elements
- Server
- HA
- Database
- KPIs
- Processes
- Tasks
- Files

Select the row for all of the servers.
Verify the HA Role is either **Active** or **Standby**.

26. **SOAM VIP GUI**: Verify the local node info

Navigate to **Main Menu->Diameter->Configuration->Local Node**.

Verify all the local nodes are shown.
Procedure 3. Recovery Scenario 3

27. **SOAM VIP GUI:** Verify the peer node info

Navigate to **Main Menu->Diameter->Configuration->Peer Node.**

- Verify all the peer nodes are shown.

28. **SOAM VIP GUI:** Verify the connections info

Navigate to **Main Menu->Diameter->Configuration->Connections.**

- Verify all the connections are shown.
## Procedure 3. Recovery Scenario 3

### 29. SOAM VIP GUI: Enable connections, if needed

Navigate to **Main Menu->Diameter->Maintenance->Connections**.

Select each connection and click **Enable**. Alternatively, you can enable all the connections by clicking **EnableAll**.

Verify the Operational State is **Available**.

### 30. SOAM VIP GUI: Enable optional features

Navigate to **Main Menu -> Diameter -> Maintenance -> Applications**.

Select the optional feature application configured in Step 31.

Click **Enable**.

### 31. SOAM VIP GUI: Re-enable transports, if needed

Navigate to **Main Menu->Transport Manager -> Maintenance -> Transport**.

Select each transport and click **Enable**.

Verify the Operational Status for each transport is **Up**.
### Procedure 3. Recovery Scenario 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Path</th>
<th>Action</th>
</tr>
</thead>
</table>
| 32.  | SOAM VIP GUI: Re-enable MAPIWF application, if needed | Navigate to **Main Menu->SS7/Sigtran->Maintenance->Local SCCP Users.**  
- SS7/Sigtran  
  - Configuration  
  - Maintenance  
    - Local SCCP Users  
    - Remote Signaling Poi  
    - Remote MTP3 Users  
    - Linksets  
    - Links  
  
  Click **Enable** corresponding to MAPIWF Application Name.  
  
  Verify the SSN Status is **Enabled**. |
| 33.  | SOAM VIP GUI: Re-enable links, if needed | Navigate to **Main Menu->SS7/Sigtran->Maintenance->Links.**  
- SS7/Sigtran  
  - Configuration  
  - Maintenance  
    - Local SCCP Users  
    - Remote Signaling Poi  
    - Remote MTP3 Users  
    - Linksets  
    - Links  
  
  Click **Enable** for each link.  
  
  Verify the Operational Status for each link is **Up**. |
| 34.  | SOAM VIP GUI: Examine all alarms | Navigate to **Main Menu->Alarms & Events->View Active.**  
- Alarms & Events  
  - View Active  
  - View History  
  - View Trap Log  
  
  Examine all active alarms and refer to the on-line help on how to address them.  
  If needed, contact Appendix E. My Oracle Support (MOS). |
### Procedure 3. Recovery Scenario 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Task Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.</td>
<td>NOAM VIP GUI: Examine all alarms</td>
<td>Log into the NOAM VIP if not already logged in. Navigate to <strong>Main Menu-&gt;Alarms &amp; Events-&gt;View Active</strong>. Examine all active alarms and refer to the on-line help on how to address them. If needed, contact Appendix E. My Oracle Support (MOS).</td>
</tr>
<tr>
<td>36.</td>
<td>Restore GUI usernames and passwords</td>
<td>If applicable, execute steps in Section 6 to recover the user and group information restored.</td>
</tr>
<tr>
<td>37.</td>
<td>Backup and archive all the databases from the recovered system</td>
<td>Execute Appendix A. DSR Database Backup to back up the configuration databases.</td>
</tr>
</tbody>
</table>

### 5.1.4 Recovery Scenario 4 (Partial Server Outage with one NOAM Server and One SOAM Server Intact)

For a partial outage with an NOAM 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 NOAM server by recovering software.**
  - Recover the software.
  - The database is intact at the active NOAM server and does not require restoration at the standby NOAM server.
  - Recover any failed SO and MP servers by recovering software.
  - Recover the software.
  - The database in intact at the active NOAM 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Task Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Workarounds</td>
<td>Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand/apply any workarounds required during this procedure.</td>
</tr>
</tbody>
</table>
### Procedure 4. Recovery Scenario 4

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.</strong></td>
<td><strong>Gather Required Materials</strong></td>
<td>Gather the documents and required materials listed in Section Required Materials.</td>
</tr>
<tr>
<td><strong>3.</strong></td>
<td><strong>NOAM VIP GUI: Login</strong></td>
<td>Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>http://&lt;Primary_NOAM_VIP_IP_Address&gt;</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Login as the <code>guiadmin</code> user.</td>
</tr>
<tr>
<td><strong>4.</strong></td>
<td><strong>Active NOAM: Set failed servers to standby</strong></td>
<td>Navigate to Main Menu -&gt; Status &amp; Manage -&gt; HA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Click <strong>Edit</strong>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Set the Max Allowed HA Role option to <strong>OOS</strong> for the failed servers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Click <strong>OK</strong>.</td>
</tr>
</tbody>
</table>
## Procedure 4. Recovery Scenario 4

<table>
<thead>
<tr>
<th></th>
<th>Recover the failed software</th>
<th>For VMWare based deployments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>For NOAMs, execute the following procedures from reference [1]:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Procedure 1 (VMWare). Import DSR OVA.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Procedure 2 (VMWare Only). Configure NOAM guests based on resource profile.</td>
<td></td>
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<td>For SOAMs, execute the following procedures from reference [1]:</td>
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<td>• Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For failed MPs, execute the following procedures from reference [1]:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Procedure 1 (VMWare). Import DSR OVA.</td>
<td></td>
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<td></td>
<td>• Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>For KVM/OpenStack based deployments:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For NOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>• Procedure 4 (KVM/OpenStack). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td>• Procedure 5 (KVM/OpenStack Only). Configure NOAM guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td>For SOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>• Procedure 4 (KVM/OpenStack). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td>• Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td>For failed MPs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>• Procedure 4 (KVM/OpenStack). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td>• Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>For OVM-S/OVM-M based deployments:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For NOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>• Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td>For SOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>• Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td>For failed MPs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>• Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>If necessary, repeat Step 5 for all remaining failed servers.</th>
<th>Repeat for remaining failed servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**For VMWare based deployments:**

1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 2 (VMWare Only). Configure NOAM guests based on resource profile.

2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.

3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.

**For KVM/OpenStack based deployments:**

1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.

2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.

3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.

**For OVM-S/OVM-M based deployments:**

1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.

2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.

3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.

---

**Procedure 4. Recovery Scenario 4**

5. Recover the failed software

6. Repeat for remaining failed servers

---

**For VMWare based deployments:**

1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 2 (VMWare Only). Configure NOAM guests based on resource profile.

2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.

3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 1 (VMWare). Import DSR OVA.
   - Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.

**For KVM/OpenStack based deployments:**

1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.

2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.

3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 4 (KVM/OpenStack). Import DSR OVA.
   - Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.

**For OVM-S/OVM-M based deployments:**

1. For NOAMs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.

2. For SOAMs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.

3. For failed MPs, execute the following procedures from reference [1]:
   - Procedure 7 (OVM-S/OVM-M). Import DSR OVA.

---

6. Repeat for remaining failed servers

If necessary, repeat Step 5 for all remaining failed servers.
### Procedure 4. Recovery Scenario 4

<table>
<thead>
<tr>
<th>Step</th>
<th>Noam VIP GUI:</th>
<th>Description</th>
</tr>
</thead>
</table>
| 7.   | Login         | Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:  
|      |               | [http://<Primary_NOAM_VIP_IP_Address>](http://<Primary_NOAM_VIP_IP_Address>)  
|      |               | Login as the **guiadmin** user. |

**Oracle System Login**  

Log In  
Enter your username and password to log in  
Session was logged out at 6:41:39 am.  
Username: **guiadmin**  
Password:  
| Change password | Log In |

8.   | Recover standby NOAM, if needed  
|      | Install the second NOAM server by executing procedures from reference [1]:  
|      | - Procedure 12 Configure the Second NOAM Server, Steps 1, 3-7  
|      | - Procedure 13 Complete Configuring the NOAM Server Group, Step 4  
**Note:** If Topology or NodeID alarms are persistent after the database restore, refer to Appendix D. Workarounds for Issues Not Fixed in This Release, or the next step.

9.   | (Optional) Recover the failed SOAM servers, if needed  
|      | If the failed server is an SOAM, recover the **remaining** SOAM servers (standby, spare) by repeating the **this step** for each SOAM server:  
|      | 1. Install the remaining SOAM servers by executing Procedure 19 **Configure the SOAM Servers**, Steps 1, 3-7, from reference [1].  
**Note:** Wait for server to reboot before continuing.
<table>
<thead>
<tr>
<th>Procedure 4</th>
<th>Recovery Scenario 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.</strong> (Optional)</td>
<td>NOAM VIP GUI: Set HA on recovered servers</td>
</tr>
<tr>
<td></td>
<td>Navigate to Status &amp; Manage -&gt; HA.</td>
</tr>
<tr>
<td></td>
<td>Click Edit.</td>
</tr>
<tr>
<td></td>
<td>For each server whose Max Allowed HA Role is set to Standby, set it to Active.</td>
</tr>
<tr>
<td></td>
<td>Click OK.</td>
</tr>
<tr>
<td><strong>11.</strong></td>
<td>Recovered Server: Login</td>
</tr>
<tr>
<td></td>
<td>Establish an SSH to the recovered server’s XMI address.</td>
</tr>
<tr>
<td><strong>12.</strong></td>
<td>Recovered Server: Sync NTP</td>
</tr>
<tr>
<td></td>
<td>1. Perform the following to retrieve the remote NTP server.</td>
</tr>
<tr>
<td></td>
<td><code>$ sudo ntpq -np</code></td>
</tr>
<tr>
<td></td>
<td>Example output:</td>
</tr>
<tr>
<td></td>
<td><code>[admusr@NOAM-2 ~]$ ntpq -np</code></td>
</tr>
<tr>
<td></td>
<td>remote refid st t when poll reach delay offset jitter</td>
</tr>
<tr>
<td></td>
<td><code>*10.240.9.186 10.250.33.2      3 u 356 1024 377 1.409 0.113 2.434</code></td>
</tr>
<tr>
<td></td>
<td>2. Stop ntpd service.</td>
</tr>
<tr>
<td></td>
<td><code>$ sudo service ntpd stop</code></td>
</tr>
<tr>
<td></td>
<td>3. Sync the date to the ntp remote server.</td>
</tr>
<tr>
<td></td>
<td><code>$ sudo ntpdate &lt;NTP remote server&gt;</code></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>The remote server below is the one gathered in sub step 1.</td>
</tr>
<tr>
<td></td>
<td>4. Start the ntp service.</td>
</tr>
<tr>
<td></td>
<td><code>$ sudo service ntpd start</code></td>
</tr>
</tbody>
</table>
Procedure 4. Recovery Scenario 4

13. (Optional) NOAM VIP GUI: Restart DSR application

Navigate to Main Menu->Status & Manage->Server.

- Status & Manage
  - Network Elements
  - Server
  - HA
  - Database
  - KPIs
  - Processes
  - Tasks
  - Files

Select the recovered server and click Restart.

Stop  Restart  Reboot  NTP Sync  Report

14. NOAM VIP GUI: Recover the C-level server (DA-MP, SBRs, IPFE, SS7-MP)

Establish an SSH session to the C-level server being recovered, login as admusr.

Execute following command to set shared memory to unlimited.

```
$ sudo shl.set -m 0
```

Execute Procedure 15 Configure the MP Virtual Machines, Steps 1, 4-11, from [1] FOR EACH recovered server.

15. NOAM VIP GUI: Restart DSR application on recovered C-level servers.

Navigate to Main Menu->Status & Manage->Server.

Select the recovered servers and click Restart.

Stop  Restart  Reboot  NTP Sync  Report

16. NOAM VIP GUI: Set HA on all C-level servers

Navigate to Status & Manage -> HA.

Click Edit.

For each server whose Max Allowed HA Role is set to Standby, set it to Active.

Click OK.
## Procedure 4.   Recovery Scenario 4

<table>
<thead>
<tr>
<th>Step</th>
<th><strong>ACTIVE NOAM:</strong></th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Login</td>
<td>Log into the recovered active NOAM via SSH terminal as <strong>admusr</strong>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th><strong>Active SOAM:</strong></th>
<th>Procedure</th>
</tr>
</thead>
</table>
| 18.  | Prepare recovered SOAM for optional feature activation | Establish an SSH session to the active SOAM, login as **admusr**. Execute the following command.  

\[
$ \text{irem DsrApplication where } \text{"name in \{"RBAR","FABR","PCA","MD-IWF","DM-IWF","CPA","GLA"\}\}}$
\]

<table>
<thead>
<tr>
<th>Step</th>
<th><strong>Active SOAM:</strong></th>
<th>Procedure</th>
</tr>
</thead>
</table>
| 19.  | Verify preparation | Execute the following command to verify preparation of optional feature activation.  

\[
$ \text{iqt -z -h -p -fname DsrApplication where } \text{"name in \{"RBAR","FABR","PCA","MD-IWF","DM-IWF","CPA","GLA"\}\}}$
\]

**Note:** There should be no output of this command, if there is, verify the correct entry of the command in Step 18.

<table>
<thead>
<tr>
<th>Step</th>
<th><strong>ACTIVE NOAM:</strong></th>
<th>Procedure</th>
</tr>
</thead>
</table>
| 20.  | Perform key exchange between the active-NOAM and recovered servers | Establish an SSH session to the active NOAM, login as **admusr**.  

Execute the following command to perform a keyexchange from the active NOAM to each recovered server.  

\[
$ \text{keyexchange admusr@<Recovered Server Hostname>}$
\]

<table>
<thead>
<tr>
<th>Step</th>
<th><strong>ACTIVE NOAM:</strong></th>
<th>Procedure</th>
</tr>
</thead>
</table>
| 21.  | Activate optional features | Establish an SSH session to the active NOAM, login as **admusr**.  

**Note For PCA Activation:**

If you have PCA installed in the system being recovered, execute the **PCA Activation on Standby NOAM Server** procedure on the recovered standby NOAM server and the **PCA Activation on Standby SOAM Server** procedure on the recovered standby SOAM server from [3] to re-activate PCA.  

Refer to Section 1.5 Optional Features to activate any features previously activated.  

**Note:** While running the activation script, the following error message (and corresponding messages) output may display. This can safely be ignored.  

\[
\text{iload#31000\{S/W Fault\}}$
\]

**Note:** If any of the MPs have failed and recovered, then these MP servers should be restarted after activation of the feature.  

Refer to Section 1.5 Optional Features to activate any features previously activated.
Procedure 4. Recovery Scenario 4

22. **NOAM VIP GUI:**

   Fetch and store the database report for the newly restored data and save it.

Navigate to **Main Menu->Status & Manage->Database.**

- Select the active NOAM server and click **Report.**

   **Main Menu: Status & Manage -> Database [Report]**

   - **Table Name:**
     - CoPw
     - CoPwInfo
     - CoPwAcc
     - CountryCode
     - GtCountry
     - NetMax
     - Nsid
     - Barm
     - UserOptions

   - **Rows:**
     - Avg: 44
     - Max: 44
     - Used: 44
     - Alloc: 44

   - **Disk Usage:**
     - Used: 44
     - Alloc: 44

Click **Save** to save the report to your local machine.
Procedure 4. Recovery Scenario 4

23. **ACTIVE NOAM:** Verify replication between servers

Log into the active NOAM via SSH terminal as **admusr**.

Execute the following command:

```
$ sudo irepstat -m
```

Output like this is 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
```

24. **NOAM VIP GUI:** Verify the database states

Navigate to **Main Menu->Status and Manager->Database**.

Verify the OAM Max HA Role is either **Active** or **Standby** for NOAM and SOAM; Application Max HA Role for MPs is **Active**; and the status is **Normal**.
Procedure 4. Recovery Scenario 4

25. **NOAM VIP GUI:** Verify the HA status

   Navigate to Main Menu->Status and Manage->HA.

   Select the row for all of the servers.

   Verify the HA Role is either **Active** or **Standby**.

26. **SOAM VIP GUI:** Verify the local node info

   Navigate to Main Menu->Diameter->Configuration->Local Node.

   Verify all the local nodes are shown.
### Procedure 4. Recovery Scenario 4

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td>SOAM VIP GUI:</td>
<td>Verify the peer node info. Navigate to Main Menu-&gt;Diameter-&gt;Configuration-&gt;Peer Node. Verify all the peer nodes are shown.</td>
</tr>
<tr>
<td>27.</td>
<td>SOAM VIP GUI:</td>
<td>Verify the connections info. Navigate to Main Menu-&gt;Diameter-&gt;Configuration-&gt;Connections. Verify all the connections are shown.</td>
</tr>
<tr>
<td>29.</td>
<td>MP Servers:</td>
<td>Disable SCTP Auth Flag. For SCTP connections without DTLS enabled, refer to Enable/Disable DTLS Appendix from reference [1]. Execute this procedure on all failed MP servers.</td>
</tr>
</tbody>
</table>
## Procedure 4. Recovery Scenario 4

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| **30.** | **SOAM VIP GUI:** Enable connections, if needed  
Navigate to **Main Menu->Diameter->Maintenance->Connections.**  
Select each connection and click **Enable.** Alternatively, you can enable all the connections by clicking **EnableAll.**  
Verify the Operational State is **Available.** |
| **31.** | **SOAM VIP GUI:** Enable optional features  
Navigate to **Main Menu -> Diameter -> Maintenance -> Applications.**  
Select the optional feature application configured in Step 22.  
Click **Enable.** |
| **32.** | **SOAM VIP GUI:** Re-enable transports, if needed  
Navigate to **Main Menu->Transport Manager -> Maintenance -> Transport.**  
Select each transport and click **Enable.**  
Verify the Operational Status for each transport is **Up.** |
## Procedure 4. Recovery Scenario 4

### 33. SOAM VIP GUI: Re-enable MAPIWF application, if needed

Navigate to **Main Menu->SS7/Sigtran->Maintenance->Local SCCP Users.**

- SS7/Sigtran
- Configuration
- Maintenance
  - Local SCCP Users
  - Remote Signaling Poi
  - Remote MTP3 Users
  - Linksets
  - Links

Click **Enable** corresponding to MAPIWF application name.

Enable [ ] Disable [ ]

Verify the SSN Status is **Enabled.**

### 34. SOAM VIP GUI: Re-enable links, if needed

Navigate to **Main Menu->SS7/Sigtran->Maintenance->Links.**

- SS7/Sigtran
- Configuration
- Maintenance
  - Local SCCP Users
  - Remote Signaling Poi
  - Remote MTP3 Users
  - Linksets
  - Links

Click **Enable** for each link.

Enable [ ] Disable [ ]

Verify the Operational Status for each link is **Up.**

### 35. SOAM VIP GUI: Examine all alarms

Navigate to **Main Menu->Alarms & Events->View Active.**

- Alarms & Events
  - View Active
  - View History
  - View Trap Log

Examine all active alarms and refer to the on-line help on how to address them.

If needed, contact Appendix E. My Oracle Support (MOS).
### Procedure 4. Recovery Scenario 4

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36. NOAM VIP GUI: Examine all alarms</td>
<td>Log into the NOAM VIP if not already logged in. Navigate to Main Menu-&gt;Alarms &amp; Events-&gt;View Active. Examine all active alarms and refer to the on-line help on how to address them. If needed contact Appendix E. My Oracle Support (MOS).</td>
</tr>
<tr>
<td>37. Restart oampAgent, if needed</td>
<td>Note: If the 10012: The responder for a monitored table failed to respond to a table change alarm is generated, the oampAgent needs to be restarted. Establish an SSH session to each server with the alarm. Login as admusr. Execute the following commands.</td>
</tr>
<tr>
<td>38. Backup and archive all the databases from the recovered system</td>
<td>Execute Appendix A. DSR Database Backup to back up the configuration databases.</td>
</tr>
</tbody>
</table>

### 5.1.5 Recovery Scenario 5 (Partial Server Outage with all NOAM servers failed with DR-NOAM available)

For a partial outage with both NOAM servers failed but a DR NOAM available, the DR NOAM is switched from secondary to primary then recovers the failed NOAM 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 5. The major activities are summarized as follows:

Switch DR NOAM from secondary to primary

Recover the failed NOAM servers by recovering base hardware and software.
- Recover the base hardware.
- Recover the software.
- The database is intact at the newly active NOAM server and does not require restoration.

If applicable, recover any failed SOAM and MP servers by recovering base hardware and software.
- Recover the base hardware.
- Recover the software.
- The database in intact at the active NOAM server and does not require restoration at the SOAM and MP servers.
**Procedure 5. Recovery Scenario 5**

<table>
<thead>
<tr>
<th>STEP</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This procedure performs recovery if both NOAM servers have failed but a DR NOAM is available.</td>
</tr>
<tr>
<td></td>
<td>Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each</td>
</tr>
<tr>
<td></td>
<td>step number.</td>
</tr>
<tr>
<td></td>
<td>If this procedure fails, contact Appendix E. My Oracle Support (MOS) and ask for assistance.</td>
</tr>
<tr>
<td>1.</td>
<td>Workarounds Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand any workarounds required during this procedure.</td>
</tr>
</tbody>
</table>
### Procedure 5. Recovery Scenario 5

<table>
<thead>
<tr>
<th>4.</th>
<th>Recover the failed software</th>
<th>For VMWare based deployments:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. For NOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 1 (VMWare). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 2 (VMWare Only). Configure NOAM guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. For SOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 1 (VMWare). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. For failed MPs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 1 (VMWare). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 3 (VMWare Only). Configure Remaining DSR guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td>For KVM/OpenStack based deployments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. For NOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 4 (KVM/OpenStack). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. For SOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 4 (KVM/OpenStack). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. For failed MPs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 4 (KVM/OpenStack). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 6 (KVM/OpenStack Only). Configure Remaining DSR guests based on resource profile.</td>
</tr>
<tr>
<td></td>
<td>For OVM-S/OVM-M based deployments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. For NOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. For SOAMs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. For failed MPs, execute the following procedures from reference [1]:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Procedure 7 (OVM-S/OVM-M). Import DSR OVA.</td>
</tr>
</tbody>
</table>

| 5. | Recover failed SOAMs | If ALL SOAM servers have failed, execute Procedure 2. |
### Procedure 5. Recovery Scenario 5

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td><strong>DR-NOAM VIP GUI: Login</strong> Establish a GUI session on the DR-NOAM server by using the VIP IP address of the DR-NOAM server. Open the web browser and enter a URL of:</td>
</tr>
<tr>
<td></td>
<td><strong>http://&lt;Primary_DR-NOAM_VIP_IP_Address&gt;</strong></td>
</tr>
<tr>
<td></td>
<td>Login as the guiadmin user.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>DR-NOAM VIP GUI: Set failed NOAM servers to standby</strong> Navigate to Main Menu -&gt; Status &amp; Manage -&gt; HA.</td>
</tr>
<tr>
<td></td>
<td>Click Edit.</td>
</tr>
<tr>
<td></td>
<td>Set the Max Allowed HA Role option to Standby for the failed NOAM servers. Click OK.</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Execute DSR installation procedure for the first NOAM</strong> Verify the networking data for network elements.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Use the backup copy of network configuration data and site surveys (Step 2).</td>
</tr>
<tr>
<td></td>
<td><strong>Execute</strong> installation procedures for the first NOAM server from reference [1]:</td>
</tr>
<tr>
<td></td>
<td>- Procedure 10 Configure the First NOAM NE and Server</td>
</tr>
<tr>
<td></td>
<td>- Procedure 11 Configure the NOAM Server Group</td>
</tr>
</tbody>
</table>
Procedure 5. Recovery Scenario 5

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td><strong>DR-NOAM VIP GUI</strong>: Export the initial configuration. Navigate to <strong>Main Menu -&gt; Configuration -&gt; Servers</strong>. From the GUI screen, select the <strong>failed NOAM server</strong> and click <strong>Export</strong> to generate the initial configuration data for that server.</td>
</tr>
</tbody>
</table>
| 10.  | **DR-NOAM VIP GUI**: Copy configuration file to failed NOAM server. Obtain a terminal session to the DR-NOAM VIP, login as **admusr**. Execute the following command to configure the failed NOAM server.  

   ```
   $ sudo scp -r /var/TKLC/db/filemgmt/TKLCConfigData.<Failed_NOAM_Hostname>.sh admusr@<Failed_NOAM_xmi_IP_address>:/var/tmp/TKLCConfigData.sh
   ```  |
| 11.  | **Recovered NOAM Server**:  

Verify configuration was called and reboot the server. Establish an SSH session to the Recovered NOAM server (Recovered_NOAM_xmi_IP_address). Login as **admusr**. The automatic configuration daemon looks for the **TKLCConfigData.sh** file in the **/var/tmp** directory, implements the configuration in the file, and asks the user to reboot the server. Verify **awpushcfg** was called by checking the following file.  

   ```
   $ sudo cat /var/TKLC/appw/logs/Process/install.log
   ```  

   Verify the following message is displayed:  

   ```
   [SUCCESS] script completed successfully!
   ```  

Now reboot the server.  

   ```
   $ sudo init 6
   ```  

Wait for the server to reboot.  

| 12.  | **Recovered NOAM Server**:  

Verify server health. Execute the following command on the failed NOAM server and make sure no errors are returned.  

   ```
   $ sudo syscheck
   ```  

   Running modules in class hardware...OK  

   Running modules in class disk...OK  

   Running modules in class net...OK  

   Running modules in class system...OK  

   Running modules in class proc...OK  

   LOG LOCATION: /var/TKLC/log/syscheck/fail_log  

| 13.  | **Repeat for additional 2nd failed NOAM**  

Repeat Steps 9-12 for the 2nd failed NOAM server. |
### Procedure 5. Recovery Scenario 5

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>Perform key exchange between active NOAM and recovered NOAMs</td>
<td>Perform a key exchange between the newly active NOAM and the recovered NOAM servers. From a terminal window connection on the active NOAM as admusr, exchange SSH keys for admusr between the active NOAM and the recovered NOAM servers using the key exchange utility, using the host names of the recovered NOAMs. When prompted for the password, enter the password for admusr of the recovered NOAM servers.</td>
</tr>
<tr>
<td>15.</td>
<td>NOAM VIP GUI: Set HA on recovered NOAMs</td>
<td>Navigate to Status &amp; Manage -&gt; HA. Click Edit. For each NOAM server whose Max Allowed HA Role is set to Standby, set it to Active. Click OK.</td>
</tr>
<tr>
<td>16.</td>
<td>NOAM VIP GUI: Restart DSR application</td>
<td>Navigate to Main Menu-&gt;Status &amp; Manage-&gt;Server. Select each recovered NOAM server and click Restart.</td>
</tr>
</tbody>
</table>
### Procedure 5. Recovery Scenario 5

#### 17. Recovered NOAM servers:
- **Activate Optional Features**
- **Map-Diameter Interworking (MAP-IWF) and/or Policy and Charging Application (PCA) Only**

Activate the features Map-Diameter Interworking (MAP-IWF) and Policy and Charging Application (PCA) as follows:

**For PCA:**

1. Establish SSH sessions to the all the recovered NOAM servers and login as *admusr*. Refer [3] and execute the **PCA Activation on Standby NOAM Server** procedure on all recovered NOAM servers to re-activate PCA.

Establish an SSH session to the recovered active NOAM, login as *admusr*.

**For MAP-IWF:**


**Note:** While running the activation script, the following error message (and corresponding messages) output may display. This can safely be ignored.

```plaintext
iload#31000{S/W Fault}
```

**Note:** If any of the MPs have failed and recovered, then these MP servers should be restarted after activation of the feature.

#### 18. Switch DR NOAM back to secondary

Once the system have been recovered, refer to DSR/SDS 8.x NOAM Failover User’s Guide, E85595 [2].

#### 19. Recovered Servers: Verify alarms

Navigate to **Main Menu -> Alarms & Events -> View Active**.

- **View Active**
- **View History**
- **View Trap Log**

Verify the recovered servers are not contributing to any active alarms (replication, topology misconfiguration, database impairments, NTP, etc.).

#### 20. NOAM VIP GUI: Recover standby/spare SOAM and C-level servers

If necessary, refer to Procedure 3. Recovery Scenario 3 to recover any standby or spare SOAMs as well as any C-level servers.

---

### 5.1.6 Recovery Scenario 6 (Database Recovery)

#### 5.1.6.1 Recovery Scenario 6: 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 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.DSR.HPC02-NO2.FullDBParts.NETWORK_OAMP.20140524_223507.UPG.tar.bz2
• Backup.DSR.HPC02-NO2.FullRunEnv.NETWORK_OAMP.20140524_223507.UPG.tar.bz2

Note: During recovery, the corrupted database is replaced by the server runtime backup. Any configuration done after taking the backup is not visible post recovery.

Procedure 6. Recovery Scenario 6 (Case 1)

<table>
<thead>
<tr>
<th>Step #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Workarounds Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand/apply any workarounds required during this procedure.</td>
</tr>
</tbody>
</table>
| 2.     | NOAM VIP GUI: Navigate to Main Menu -> Status & Manage -> HA 
Set Failed Servers to Standby 
Click Edit. 
Set the Max Allowed HA Role option to OOS for the failed servers. 
Click OK. |
| 3.     | Server in Question: Login Establish an SSH session to the server in question. Login as admusr. |
| 4.     | Server in Question: Change runlevel to 3 Execute the following command to bring the system to runlevel 3. $ sudo init 3 |
| 5.     | Server in Question: Recover System Execute the following command and follow the instructions appearing the console prompt. $ sudo /usr/TKLC/appworks/sbin/backout_restore |
| 6.     | Server in Question: Change runlevel to 4 Execute the following command to bring the system back to runlevel 4. $ sudo init 6 |
## Procedure 6.  Recovery Scenario 6 (Case 1)

### 7. Server in Question: Verify the server

Execute the following command to verify if the processes are up and running.

```
$ sudo pm.getprocs
```

### 8. NOAM VIP GUI: Set failed servers to Active

Navigate to Status & Manage -> HA.

- Click Edit.
- For each failed server whose Max Allowed HA Role is set to OOS, set it to Active.
- Click OK.

### 9. Backup and archive all the databases from the recovered system

Execute Appendix A. DSR Database Backup to back up the configuration databases.

## 5.1.6.2 Recovery Scenario 6: Case 2

For a partial outage with:

- Server having a corrupted database
- Replication channel is not inhibited or
- Server has the same release the active parent

### Procedure 7.  Recovery Scenario 6 (Case 2)

<table>
<thead>
<tr>
<th>STEP</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong></td>
<td>Workarounds Refer to Appendix D. Workarounds for Issues Not Fixed in This Release to understand/apply any workarounds required during this procedure.</td>
</tr>
<tr>
<td><strong>2.</strong></td>
<td>Workarounds</td>
</tr>
</tbody>
</table>

This procedure performs recovery if database is 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 Appendix E. My Oracle Support (MOS) and ask for assistance.
### Procedure 7. Recovery Scenario 6 (Case 2)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td><strong>NOAM VIP GUI:</strong> &lt;br&gt;Set failed servers to standby</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Server in Question:</strong> Login</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Server in Question:</strong> Take server out of service</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Server in Question:</strong> Take server to dbup state and start the application</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Server in Question:</strong> Verify the server state</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Procedure 7. Recovery Scenario 6 (Case 2)

#### 7. NOAM VIP GUI: Restart DSR application

Navigate to `Main Menu->Status & Manage->Server`. Select each recovered server and click **Restart**.

#### 8. NOAM VIP GUI: Set failed servers to active

Navigate to `Status & Manage -> HA`. Click **Edit**. For each failed server whose Max Allowed HA Role is set to OOS, set it to **Active**. Click **OK**.

#### 9. Backup and archive all the databases from the recovered system

Execute Appendix A. DSR Database Backup to back up the configuration databases.

---

### 6. 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 the restoration will not impact security or accessibility.

#### 6.1 Restore a Deleted User

---

These users were removed before creating the backup and archive file. They are reintroduced by system restoration of that file.
## 6.2 Keep a Restored User

**Procedure 8. Keep Restored User**

<table>
<thead>
<tr>
<th>STEP #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Perform this procedure to keep users 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 Appendix E. My Oracle Support (MOS) and ask for assistance.</td>
</tr>
</tbody>
</table>

**1. Before Restoration:** Contact each user affected before the restoration and notify them you are resetting their password during this maintenance operation.

**2. After Restoration:** Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:

http://<Primary_NOAM_VIP_IP_Address>

Login as the **guiadmin** user.
### Procedure 8. Keep Restored User

3. **After Restoration:**
   - Reset User Passwords

<table>
<thead>
<tr>
<th>After Restoration: Reset User Passwords</th>
<th>Navigate to Administration -&gt; Access Control -&gt; Users.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Administration</td>
</tr>
<tr>
<td></td>
<td>General Options</td>
</tr>
<tr>
<td></td>
<td>Access Control</td>
</tr>
<tr>
<td></td>
<td>Users</td>
</tr>
<tr>
<td></td>
<td>Groups</td>
</tr>
</tbody>
</table>

Select the user.

Click **Change Password**.

Enter a new password.

Insert Edit Delete Report Change Password

![Change Password dialog](image)

Enter the new password for **guadmin** two times.

- New Password:
- Retype New Password:
- Force password change on next login

Click **Continue**.
## 6.3 Remove a Restored User

### Procedure 9. Remove the Restored User

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| **1.** | After Restoration: Log into the NOAM VIP  
| | Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:  
| | http://<Primary_NOAM_VIP_IP_Address>  
| | Login as the guiadmin user. |

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| **2.** | After Restoration: Reset User Passwords  
| | Navigate to Administration -> Access Control -> Users.  
| | Select the user.  
| | Click Delete.  
| | Click OK. |
6.4 Restore a Modified User

These users have had a password change before creating the backup and archive file. They are 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 you have access to a user with administrator permissions that is not affected.

Contact each user affected and notify them you are resetting their password during this maintenance operation.

**After Restoration:**

Log in and reset the passwords for all users in this category. See the steps in Appendix E. My Oracle Support (MOS) for resetting passwords for a user.

6.5 Restore an Archive that Does Not Contain a Current User

These users have been created after the creation of the backup and archive file. They are deleted by system restoration of that file.

- User 'testuser' exists in current database but not in the selected backup file.

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

**Procedure 10. Restoring an Archive that Does Not Contain a Current User**

<table>
<thead>
<tr>
<th>STEP #</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Before Restoration: Notify affected users before restoration</td>
</tr>
</tbody>
</table>

Perform this procedure to remove users 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 Appendix E. My Oracle Support (MOS) and ask for assistance.
**Procedure 10. Restoring an Archive that Does Not Contain a Current User**

2. **Before Restoration:**
   - Log into the NOAM VIP
   - Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:
     
     ![Image](http://<Primary_NOAM_VIP_IP_Address>)

   Login as the `guiadmin` user.

3. **Before Restoration:**
   - Record user settings
   - Navigate to Administration -> Access Control -> Users.
     
     ![Image](http://<Primary_NOAM_VIP_IP_Address>)

   Under each affected user, record the following:
   - Username
   - Account status
   - Remote Auth
   - Local Auth
   - Concurrent Logins Allowed
   - Inactivity Limit
   - Comment
   - Groups
Procedure 10. Restoring an Archive that Does Not Contain a Current User

<table>
<thead>
<tr>
<th>4. After Restoration: Login</th>
<th>Establish a GUI session on the NOAM server by using the VIP IP address of the NOAM server. Open the web browser and enter a URL of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>http://&lt;Primary_NOAM_VIP_IP_Address&gt;</strong></td>
</tr>
</tbody>
</table>

Login as the *guiadmin* user.

![Oracle System Login](image-url)
Procedure 10. Restoring an Archive that Does Not Contain a Current User

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>After Restoration: Recreate affected user</td>
</tr>
<tr>
<td></td>
<td>Navigate to Administration -&gt; Access Control -&gt; Users.</td>
</tr>
<tr>
<td></td>
<td>Click Insert.</td>
</tr>
<tr>
<td></td>
<td>Recreate the user using the data collected in Step 3.</td>
</tr>
<tr>
<td></td>
<td>Click OK.</td>
</tr>
<tr>
<td>6.</td>
<td>After Restoration: Repeat for additional users</td>
</tr>
<tr>
<td></td>
<td>Repeat Step 5 to recreate additional users.</td>
</tr>
<tr>
<td>7.</td>
<td>After Restoration: Reset the passwords</td>
</tr>
<tr>
<td></td>
<td>See Section 6.2 Keep a Restored User for resetting passwords for a user.</td>
</tr>
</tbody>
</table>
## 7. IDIH Disaster Recovery

### Procedure 11. IDIH Disaster Recovery Preparation

<table>
<thead>
<tr>
<th>STEP #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Oracle Guest: Login</strong>&lt;br&gt;Establish an SSH session to the Oracle guest, login as <strong>admusr</strong>.</td>
</tr>
</tbody>
</table>

This procedure performs disaster recovery preparation steps for the IDIH. Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number.

If this procedure fails, contact Appendix E. My Oracle Support (MOS) and ask for assistance.
## Procedure 11. IDIH Disaster Recovery Preparation

<table>
<thead>
<tr>
<th>Step</th>
<th>Oracle Guest: Perform database health check</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Execute the following command to perform a database health check.</td>
</tr>
</tbody>
</table>

```
$ sudo /usr/TKLC/xIH/plat/bin/analyze_server.sh -i
```

### Output

![Database health check output]

**Note:** If this step fails, a re-installation is necessary by following procedure from reference [1]:

For VMware based deployments:
- Section 4.9 (Procedure 29) **Create IDIH Virtual Machines (VMWare)**
- Section 4.12 (Procedure 32 – 35) **Configure IDIH Virtual Machines**

For KVM/Openstack based deployments:
- Section 4.10 (Procedure 30) **Create IDIH Virtual Machines (KVM/Openstack)**
- Section 4.12 (Procedure 32 – 35) **Configure IDIH Virtual Machines**

For OVM-S/OVM-M based deployments:
- Section 4.11 (Procedure 31) **Create IDIH Virtual Machines (OVM-S/OVM-M)**
- Section 4.12 (Procedure 32 – 35) **Configure IDIH Virtual Machines**
## Procedure 12. IDIH Disaster Recovery (Re-Install Mediation and Application Servers)

This procedure performs disaster recovery for the IDIH by re-installing the mediation and application servers. Check off (✓) each step as it is completed. Boxes have been provided for this purpose under each step number. If this procedure fails, contact Appendix E. My Oracle Support (MOS) and ask for assistance.

<table>
<thead>
<tr>
<th>Step #</th>
<th>Description</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Create iDIH application and mediation VMs</td>
<td>Execute the following procedure from [1] to recover the Application and Mediation VMs:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For VMWare based deployments:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Procedure 29 (VMware only) Create iDIH Oracle, Mediation and Application VMs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For KVM/Openstack based deployments:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Procedure 30. (KVM/OpenStack only) Create iDIH Oracle, Mediation and Application VMs (Optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For OVM-S/OVM-M based deployments:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Procedure 31. (OVM-S/OVM-M only) Create iDIH Oracle, Mediation and Application VMs (Optional)</td>
</tr>
<tr>
<td>2.</td>
<td>Configure iDIH VM networks</td>
<td>Execute Procedure 32 Configure iDIH VM Networks from [1] to configure the VM networks on the Application and Mediation VMs only.</td>
</tr>
<tr>
<td>3.</td>
<td>Configure VMs</td>
<td>Execute Procedure 33 Run Post Installation Scripts on iDIH VMs, Steps 3 – 7, from [1].</td>
</tr>
<tr>
<td>4.</td>
<td>Integrate into DSR (Optional)</td>
<td>If integration is needed, execute Procedure 36. Integrate iDIH into DSR from [1].</td>
</tr>
</tbody>
</table>
### Appendix A. DSR Database Backup

**Procedure 13. Back up the provision and configuration data**

<table>
<thead>
<tr>
<th>STEP #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The intent of this procedure is to back up the provision and configuration information from an NOAM 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 Appendix E. My Oracle Support (MOS) and ask for assistance.</td>
<td></td>
</tr>
</tbody>
</table>

1. **NOAM/SOAM VIP: Login**
   - Establish a GUI session on the NOAM or SOAM server by using the VIP IP address of the NOAM or SOAM server.
   - Open the web browser and enter a URL of: `http://<Primary_NOAM/SOAM_VIP_IP_Address>`
   - Login as the `guiadmin` user.
**Procedure 13. Back up the provision and configuration data**

<table>
<thead>
<tr>
<th>NOAM/SOAM VIP: Backup configuration data for the system</th>
<th>Navigate to <strong>Main Menu -&gt; Status &amp; Manage -&gt; Database.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Navigate to <strong>Status &amp; Manage</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Network Elements</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Server</strong></td>
</tr>
<tr>
<td></td>
<td><strong>HA</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Database</strong></td>
</tr>
<tr>
<td></td>
<td><strong>KPIs</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Processes</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Tasks</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Files</strong></td>
</tr>
</tbody>
</table>

Select the **active NOAM server** and click **Backup**.

Make sure the **Configuration** checkbox is marked.

![Database Backup](image)

Type a **filename** for the backup and click **OK**.
### Procedure 13. Back up the provision and configuration data

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td><strong>NOAM/SOAM VIP:</strong> Verify the backup file existence</td>
</tr>
<tr>
<td></td>
<td>Navigate to <strong>Main Menu -&gt; Status &amp; Manage -&gt; Files.</strong></td>
</tr>
<tr>
<td></td>
<td>- Navigate to <strong>Main Menu -&gt; Status &amp; Manage -&gt; Files.</strong></td>
</tr>
<tr>
<td></td>
<td>- Select the active NOAM or SOAM tab.</td>
</tr>
<tr>
<td></td>
<td>The files on this server display. Verify the existence of the backup file.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>NOAM/SOAM VIP:</strong> Download the file to a local machine</td>
</tr>
<tr>
<td></td>
<td>From the previous step, choose the backup file.</td>
</tr>
<tr>
<td></td>
<td>Click <strong>Download.</strong></td>
</tr>
<tr>
<td></td>
<td>Click <strong>OK</strong> to confirm the download.</td>
</tr>
<tr>
<td>5.</td>
<td>Upload the image to secure location</td>
</tr>
<tr>
<td></td>
<td>Transfer the backed up image saved in the previous step to a secure location where the Server Backup files are stored in case of system disaster recovery.</td>
</tr>
<tr>
<td>6.</td>
<td>Backup active SOAM</td>
</tr>
<tr>
<td></td>
<td>Repeat <strong>Steps 2 through 5</strong> to back up the active SOAM.</td>
</tr>
</tbody>
</table>
**Appendix B. Inhibit A and B Level Replication on C-Level Servers**

**Procedure 14. Inhibit A and B Level Replication on C-Level Servers**

<table>
<thead>
<tr>
<th>STEP #</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1.     | **Active NOAM: Login**  
Log into the active NOAM server via SSH as **admusr**.                                                 |
| 2.     | **Active NOAM: Inhibit replication on all C-level servers**  
Execute the following command.                                                                     |

```bash
$ for i in $(iqt -p -z -h -fhostName NodeInfo where "nodeId like 'C*' and siteId='<NE name of the site>'");
do iset -f inhibitRepPlans='A B' NodeInfo where "nodeName='$i'"; done
```

**Note:** NE name of the site can be found out by logging into the active NOAM GUI and navigating to Configuration->Server Groups.
Procedure 14. Inhibit A and B Level Replication on C-Level Servers

3. **Active NOAM:**
   - 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.

   Verify replication inhibition on MPs by analyzing NodeInfo output. InhibitRepPlans field for all the MP servers for the selected site, e.g., Site SO_HPC03 is set as A B.

   Perform the following command:

   ```
   $ sudo iqt NodeInfo
   ```

   **Expected output:**

<table>
<thead>
<tr>
<th>nodeID</th>
<th>nodeName</th>
<th>hostName</th>
<th>nodeCapability</th>
<th>inhibitRepPlans</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1386.099</td>
<td>NO1</td>
<td>NO1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>B1754.109</td>
<td>SO1</td>
<td>SO1</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>C2254.131</td>
<td>MP2</td>
<td>MP2</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>C2254.233</td>
<td>MP1</td>
<td>MP1</td>
<td>Active</td>
<td></td>
</tr>
</tbody>
</table>

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

Procedure 15. Un-Inhibit A and B Level Replication on C-Level Servers

1. **Active NOAM:**
   - Login

   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 Appendix E. My Oracle Support (MOS) and ask for assistance.

   Log into the active NOAM server via SSH as admusr.
Procedure 15. Un-Inhibit A and B Level Replication on C-Level Servers

2. **Active NOAM:**
   - **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 NOAM GUI and navigating to Configuration->Server Groups.

3. **Active NOAM:**
   - **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
   ```

Appendix D. Workarounds for Issues Not Fixed in This Release

<table>
<thead>
<tr>
<th>Issue</th>
<th>Associated PR</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inetsync alarms after performing disaster recovery</td>
<td>Bug 19095639</td>
<td>Restart the Inetsync service on all affected servers using the following commands.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ pm.set off inetsync</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ pm.set on inetsync</td>
</tr>
</tbody>
</table>
Appendix E. 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:

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

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