Oracle® Communications
User Data Repository 10.0.1

Disaster Recovery Guide

Release 10.0.1

E58585-02

May 2015

ORACLE®

Oracle Communications UDR Disaster Recovery Procedure, Release 10.0.1

⚠ **CAUTION: Use only the Disaster Recovery procedure included in the Disaster Recovery Kit.**

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

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

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html.

See more information on MOS in the Appendix section.

TABLE OF CONTENTS

List of Figures

List of Tables

List of Procedures

1   INTRODUCTION

1.1 Purpose and Scope

This document describes disaster recovery procedures used during disaster scenarios of the OCUDR 10.0.1 product.

This document is a guide to describe procedures used to execute disaster recovery for OCUDR 10.0.1 This includes recovery of partial or a complete loss of one or more OCUDR servers (Primary or DR). 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 provides step-by-step instructions to execute disaster recovery for OCUDR 10.0.1   Executing this procedure also involves referring to and executing procedures in existing support documents.

This document is intended for execution by Customer Service team on the fielded OCUDR 10.0.1 systems. It also could be used at Oracle's Tekelec site by PV and development teams.

1.2 References

[1] *HP Solutions Firmware Upgrade Pack,* 795-0000-2xx, v2.2.x (latest recommended, 2.2.4 minimum)

[2] *Oracle CommunicationsUDR Initial Installation and Configuration Guide, UG006455*

[3] *TPD Initial Product Manufacture*, 909-2130-001

[4] *Platform 6.x Configuration Procedure Reference*, 909-2249-001

[5] *PM&C 5.x Disaster Recovery*, 909-2210-001

[6] *Appworks Database Backup and Restore,* UG005196

[7] *Cabinet Assembly Instructions*, 910-6083-001

[8] *Database Management: Backup and System Restoration*, UG005196

[9] *Automatic Promotion of DR NO, FD007314*

[10]*Oracle Communications UDR 10.0 Hardware and Software Installation Procedure, E48809,* Revision 01

1.3 Acronyms

Acronym	Meaning
BIOS	Basic Input Output System
CD	Compact Disk
DR	Disaster Recovery
FRU	Field Replaceable Unit
IMI	Internal Management Interface
ISL	Inter-Switch-Link
NE	Network Element
MP Host Server	Server that contains one SOAM and two MPs
NOAMP	Network Operations, Administration, Maintenance & Provisioning
OCUDR	Oracle Communications User Data Repository
iLO	HP Integrated Lights-Out
ISO	Contains software images
Management Server	HP ProLiant DL 360 or DL380 server deployed with HP c-class used to host PM&C application in a virtual machine , to configure Cisco 4948E switches and to serve other configuration purpose. This server is deployed with a quad serial card and is connected to both switches.
NAPD	A copy of the HP Misc Firmware DVD or ISO of the original networking xml files custom for this installation can be found here.
PM&C	Platform Management & Configuration
PM&C Application	PM&C is an application that provides platform-level management functionality for HP G6 system, such as the capability to manage and provision platform components of the system so it can host applications.
RMS	Rack Mount Server
SOAM	Systems Operations, Administration & Maintenance
TAC	Technical Assistance Centers
TPD	Tekelec Platform Distribution (Linux OS)
UDR	User Data Repository
"Server hosting UDR in a box"	A "Server hosting UDR in a box" (consists of 1 NOAMP, 1 SOAM and 1 MP on a single server.) This includes all OCUDR software running on a TVOE virtualization environment in each server, resulting in a fully-virtualized, fully-redundant HA configuration. This can be deployed either as a single site or as a geo-redundant deployment, with 2 servers at each site.
TVOE	Tekelec Virtual Operating Environment
VIP	Virtual IP

VM	Virtual Machine
XMI	External Management Interface
VSP	Virtual Serial Port

1.4 Terminology

Table 1. Terminology

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

1.5 How to Use this Document

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

- Before beginning a procedure, completely read the instructional text (it appears immediately after the Section heading for each procedure) and all associated procedural WARNINGS or NOTES.
- Before execution of a STEP within a procedure, completely read the left and right columns including any STEP specific WARNINGS and/or NOTES.

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

2   GENERAL DESCRIPTION

2.1   Configurations

2.1.1   Normal Capacity Configuration

This includes 2 MP Host Servers running on a TVOE virtualization environment in each server. The remaining 2 servers host the NOAMP server and database. The same servers can also be configured in a second site for a geo-redundant configuration.
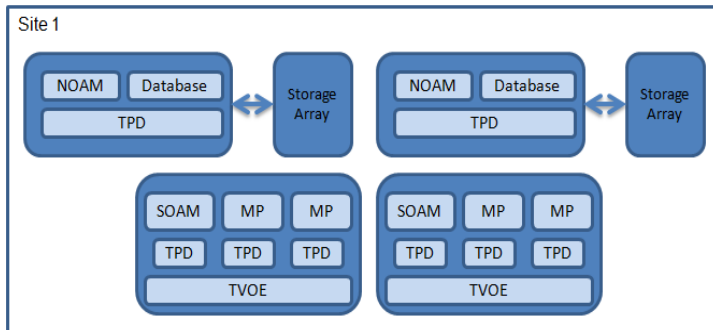
Figure 1: Normal Capacity Single-Site Configuration

2.1.2   Low Capacity Configuration

This includes all OCUDR software running on a TVOE virtualization environment in each server, resulting in a fully-virtualized, fully-redundant HA configuration. This can be deployed either as a single site or as a geo-redundant deployment, with 2 servers at each site. (Each blade/server hosts 1 NOAMP, 1 SOAM and 1 MP instance).
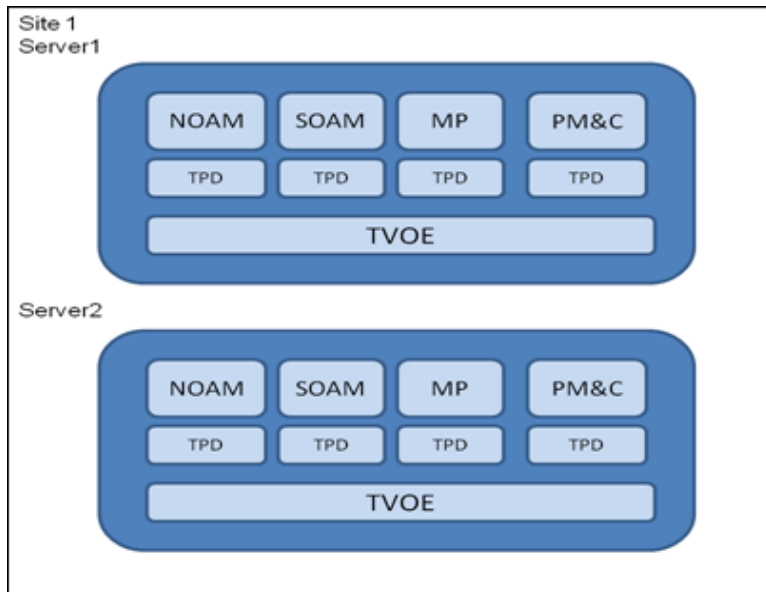
Figure 2: Low Capacity server Configuration Single Site

2.2 Recovery Procedure Categories

The OCUDR disaster recovery procedure falls into seven basic categories:

1) Primary or DR NOAMP server has failed and needs replacement
- Either the active,standby or one of the spare NOAMP servers has failed and needs to be replaced. If the active fails, the standby server will become active and start to receive provisioning data.
- NOAMP server is recovered using base recovery of hardware and/or software.
- Database replication from the active NOAMP server will recover the database to the replaced NOAMP server.

2) MP Host server (contains 1 SOAM and 2 MPs) has failed and needs replacement
- Either the active or standby MP Host server has failed and needs to be replaced. If the active MP Host server fails, the standby MP Host server will become active.
- MP Host server is recovered using base recovery of hardware and/or software.
- Database replication from the active server will recover the database to the MP Host server.

3) Primary or DR NOAMP server pair has failed and needs replacement

- Both NOAMP servers at a site failed (Primary or DR).
- NOAMP servers are recovered using base recovery of hardware and/or software.

   Three scenarios are possible here:

- If the primary active and standby NOAMP servers failed, the DR NOAMP servers will automatically be activated. This allows provisioning to continue at the DR NOAMP temporarily until the primary site is recovered. Control will resume back to primary site once the first NOAMP is back in service. Refer to [9] for more details on automatic failover to DR site. Replication from the DR site will restore the Database on the first NOAMP.
- If no DR site is available, the user will need access to the most recent NOAMP backup archive file that contains both Provisioning and Configuration data. This backup archive file should be in uncompressed format. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage). The servers are then restored using these database backups to the active NOAMP and SOAM servers. 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.
- The DR NOAMPs needs to be replaced. Replication from primary site will restore the DB.

4) MP Host server pair (contains 2 SOAMs and 4 MPs) has failed and needs replacement
- Both MP Host servers at a site failed.
- MP Host servers are recovered using base recovery of hardware and/or software.
- SOAM backup archive is needed for Diameter Configuration. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage).

5) Primary or DR "Server hosting UDR in a box" has failed and needs replacement (Consists of 1 NOAMP, 1 SOAM and 1 MP on a single server)

- o Either the active,standby or one of the spare servers has failed and needs to be replaced. If the active fails, the standby server will become active and start to receive provisioning data.
- o Server hosting "UDR in a box" is recovered using base recovery of hardware and/or software.
- o Database replication from the active NOAMP will recover the database to the replaced NOAMP.

6) Primary or DR "Server hosting UDR in a box" pair has failed and needs replacement   (Server consists of 1 NOAMP, 1 SOAM and 1 MP)

- o Both servers at a site failed (Primary or DR).
- o Servers are recovered using base recovery of hardware and/or software.
- o SOAM backup archive is needed for Diameter Configuration. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage).

   Three scenarios are possible here:

- o If the primary active and standby servers failed, the DR servers will automatically be activated. This allows provisioning to continue at the DR NOAMP temporarily until the primary site is recovered. Control will resume back to primary site once the Server's first NOAMP is back in service. Refer to [9] for more details on automatic failover to DR site. Replication from the DR site will restore the Database on the first Server's NOAMP.
- o If no DR site is available, the user will need access to the most recent NOAMP backup archive file that contains both Provisioning and Configuration data. This backup archive file should be in uncompressed format. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage). The servers are then restored using these database backups to the active NOAMP and SOAM servers. 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.
- o The DR Host Server pair needs to be replaced. Replication from primary site will restore the DB.

7) Whole site failure (Primary or DR Site has suffered complete software and/or hardware failure)
- o For Normal Capacity C-Class or RMS Configuration (RMS Configuration will be supported only for lab testing systems):
- o Both NOAMP servers failed at a Primary or DR site (see #3 in this section for details) and
- o Both MP Host servers have failed at a site (Each host contains 1 SOAM and 2 MPs) (see #4 in this section for details)
- o For Low Capacity RMS or Low Capacity C-Class Configuration:
- o Both "Servers hosting UDR in a box" failed at a Primary or DR site (see #6 in this section for details)

Note that for Disaster Recovery of the PM&C Server, Aggregation switches, OA or 6120/3020 switches, refer to Appendix B.

3   PROCEDURE OVERVIEW

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

3.1 Required Materials

The following items are needed for disaster recovery:

1.   A hardcopy of this document (UG006480) and hardcopies of all documents in the reference list: [1] through [10].

2.   Hardcopy of all site surveys performed at the initial installation and network configuration of this customer's site. If the site surveys cannot be found, escalate this issue within My Oracle Support (MOS) [refer to Appendix C] until the site survey documents can be located.

3.   OCUDR 10.0.1backup files: electronic backup file (preferred). Check [8] for more details on the backup procedure.

4.   Latest Network Element report: electronic file or hardcopy of Network Element report.

5.   Tekelec Platform Distribution (TPD) Media (64 bits).

6.   Platform Management & Configuration (PM&C) CD-ROM.

7.   OCUDR 10.0.1 CD-ROM (or ISO image file on USB Flash) of the target release.

8.   TVOE Platform Media (64 bits)

9.   The xml configuration files used to configure the switches, available on the PM&C Server.

10. The network element XML file used for the blades initial configuration.

11. The HP firmware upgrade Kit

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

4   DISASTER RECOVERY PROCEDURE

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

Contact My Oracle Support (MOS) as referenced in Appendix C prior to executing this procedure to ensure that the proper recovery planning is performed.

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

****   WARNING *****

****   WARNING *****

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

Recovering Base Hardware

1. Hardware Recovery will be executed bv My Oracle Support (MOS).
2. Base Hardware Replacement must be controlled by engineer familiar with OCUDR 10.0.1 Application.

4.1 Replacement of a Primary or DR NOAMP Server

A Primary or DR NOAMP server has stopped functioning (one of the four NOAMP servers). For a partial outage with an active NOAMP server and a SOAM server intact and available, only base recovery of hardware and software is needed. The intact active NOAMP server is capable of restoring the database via replication to the replaced NOAMP server (does not require manual restoration at the standby/spare NOAMP server). The recovery steps are detailed in Procedure 1 below.

4.1.1 Pre-Conditions

- Primary or DR NOAMP server has failed. (Active, Standby or Spare)
- If the active NOAMP server stopped functioning, the standby NOAMP server has become active.
- Primary NOAMP GUI is accessible.
- It has been determined to replace defective NOAMP server.
- The new NOAMP server replacement is available.
- For Normal Capacity Configurations only.

4.1.2 Alarms During Replacement of NOAMP Servers

The following alarms may appear during the NOAMP replacement and can be ignored:
- 10009 Config and Prov DB not yet synchronized
- 19800 Communication Agent Connection Down
- 19820 Communiation Agent Routed Service Unavailable
- 13001 No Remote RAS Client Connections
- 13027 No Remote XSAS Client Connections

4.1.3 Recovery Steps

Procedure 1. Replacement of a Primary or DR NOAMP Server

S T E P #	This procedure performs recovery if one NOAMP server has failed. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ☐	Prepare for server replacement.	Identify the defective NOAMP server that needs to be replaced Hostname _____

2 ☐	Force defective NOAMP server to be "Standby" or "Spare" so it does not become active.	1. Login to the NOAMP GUI as admin user using VIP address. 2. Select [Main Menu: Status & Manage → HA] screen 3. Click 'Edit' button 4. Change "Max Allowed HA Role" of NOAMP server that needs to be replaced to 'Standby' if primary server or to 'Spare' if DR server. 5. Click OK button
3 ☐	Remove NOAMP from the server group.	1. Select [Main Menu: Configuration → Server Groups] screen. 2. Select NOAMP's server group. 3. Click "Edit" button. 4. Under 'SG Inclusion', uncheck the defective NOAMP server 5. Click "Ok" button
4 ☐	Power down and replace NOAMP server.	1. Power down the defective NOAMP server 2. **RMS Only**: Label all cables connected to defective NOAMP server 3. **RMS Only**: Disconnect all cables 4. Physically remove the server (RMS or blade) for the replacement. 5. Wire in the new NOAMP server according to the cables you labeled and removed from the old NOAMP server OR insert new server blade. 6. Power up the new NOAMP server
5 ☐	Prepare/Install the new NOAMP server	1. For Normal Capacity C-Class Configuration Only: Execute Procedure 1 "Install NOAMP Servers (NO and DR Network Elements)" in reference [2]. 2. For Normal Capacity RMS Configuration Only: Execute Procedure 6 "Install NOAMP Servers (NO and DR Network Elements)" in reference [2]. *3.* **Important Note:** *Some of the steps in this procedure are for the Primary Active NOAMP only, these are noted in the procedure. Don't run for this scenario.*
6 ☐	Configuration of NOAMP Server On Primary NOAMP Select… **Main Menu** → **Configuration** → *Servers*	1. Select the replaced standby/spare NOAMP 2. Select the Export dialogue button 3. The configuration file will be created and stored in the /var/TKLC/db/filemgmt directory on the active NOAMP. The configuration file will have a file name like TKLCConfigData.<*hostname*>.sh. 4. Execute one of the "Applying Server Configuration" procedures in Appendix K in reference [2].
7 ☐	On Primary NOAMP Add new NOAMP server to the NOAMP server group	1. Select [Main Menu: Configuration → Server Groups] screen. 2. Select NOAMP's server group. 3. Click "Edit" button. 4. Under 'SG Inclusion', check the new NOAMP server 5. Click "Ok" button **Note:** *If the NOAMP server being added to the server group is a DR NOAMP, then the preferred spare option needs to be selected.*

8 ☐	On Primary NOAMP Make new NOAMP server Active (remove forced standby or Spare)	1. Select [Main Menu: Status & Manage → HA] screen 2. Click 'Edit' button 3. Change "Max Allowed HA Role" of the new NOAMP server to 'Active' if it's a primary server or a DR server. 4. Click OK button
9 ☐	Restart the application on NOAMP server	1. Select [Main Menu: Status & Manage → Server] screen. 2. Verify the "DB" status displays "Norm" and the "Proc" status shows "Man" for the new NOAMP server before preceding to the next step. 3. Select the new server and then select "Restart" from the bottom left corner of the screen. 4. Click OK button 5. The Info tab should display a confirmation message for the NOAMP Server stating: "[server name]:Successfully restarted application". 6. Verify that the "Appl State" now shows "Enabled" and the "Proc" status column show "Norm" for the new NOAMP Server. 7. Database replication from the active NOAMP server will recover the database on this server after it's restarted.
10 ☐	**(OPTIONAL) ACTIVE NOAM:** Re-Sync NTP if Necessary	Navigate to **Status & Manage -> Server**, then select **each** server that has been recovered and click **NTP Sync**.
11 ☐	Re-exchange SSH keys for Prov Import/Export Features	1. Login to Primary NOAMP GUI as admin user. 2. Perform SSH key exchange for **Prov Import/Export** using this screen [Main Menu: UDR → Configuration → Provisioning Options
12 ☐	Verify the Database state of the newly restored server	1. Click on Main Menu->Status and Manage->Database 2. Verify that the OAM Max HA Role is either "Active" or "Standby" or "Spare" and that the status is "Normal".
13 ☐	Verify the HA Status	1. Click on Main Menu->Status and Manage->HA 2. Check the row for the newNOAMP Server. 3. Verify that the Max Allowed HA role is Active.
14 ☐	Examine All Alarms	1. Click on Main Menu->Alarms & Events->View Active 2. Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS) as referenced in Appendix C.
15 ☐	Verify new NOAMP server was synched	Examine Main Menu:Configuration->Network Elements, Main Menu:Configuration->servers, etc were updated with the replicated data. **Note:** *The Database sync time can take up to 90 minutes to complete.*
16 ☐	Backup and archive all the databases from the recovered system	Execute Appendix A "OCUDR 10.0.1 Database Backup": "Replacement of a NOAMP Server" is Complete.

End of Procedure

4.1.4 Post Condition

- Primary or DR NOAMP server is back in service

4.2 Replacement of a MP Host Server

For a partial outage with an active NOAMP server and an active MP Host server intact and available, only base recovery of hardware and software is needed. The intact active NOAMP and active MP Host server are capable of restoring the database via replication to the replaced MP Host server (does not require manual restoration at the standby MP Host server). The recovery steps are detailed in Procedure 2 below.

4.2.1 Pre-Conditions

- An MP Host server active or standby has failed and needs replacement. (An MP Host Server consists of 1 SOAM and 2 MPs).

- Normal Capacity C-Class RMS Configuration. RMS Configuration will be supported only for lab testing systems.

- If the active MP Host server stopped functioning, the standby MP Host server has become active.

- Primary NOAMP and SOAM GUI is accessible.

- It has been determined to replace defective MP Host server.

- The new MP Host server replacement is available.

- For Normal Capacity Configurations only.

4.2.2 Recovery Steps

Procedure 2. Replacement of a MP Host Server

1 ☐	Prepare for server replacement.	Identify the defective MP Host server (Consists of 1 SOAM and 2 MPs) that needs to be replaced: Hostname _____
2 ☐	Force defective MP Host server to be "Standby" so it does not become active.	1. Login to the NOAMP GUI as admin user using VIP address. 2. Select [Main Menu: Status & Manage → HA] screen 3. Click 'Edit' button 4. Change "Max Allowed HA Role" of MP Host server that needs replacement to 'Standby' (This includes 1 SOAM and 2 MPs) 5. Click OK button
3 ☐	Remove MP Host server from the server group at active NOAMP.	1. Select [Main Menu: Configuration → Server Groups] screen. 2. Select SOAM server group. 3. Click "Edit" button. 4. Under 'SG Inclusion', uncheck the defective SOAM server 5. Click "Ok" button 6. Select MP server group. 7. Click "Edit" button. 8. Under 'SG Inclusion', uncheck the defective MP servers 9. Click "Ok" button
4 ☐	Power down and replace MP Host server.	1. Power down the defective MP Host server 2. **RMS Only**: Label all cables connected to defective NOAMP serverDisconnect all cables if RMS 3. Physically remove the server (RMS or blade) for the replacement. 4. Wire in the new MP Host server according to the cables you labeled and removed from the old MP Host server. 5. Power up the new MP Host server
5 ☐	Prepare/Install the new MP Host server	**For Normal Capactiy C-Class Configuration Only:** 1. Execute Procedure 2 "Install SOAM/MP Host Servers" in reference [2]. 2. Execute Procedure 3 "Create, IPM and Install Application on Virtual Machines in reference [2].
6 ☐	Prepare/Install the new MP Host server	**For Normal Capacity RMS Configuration Only:** 1. Execute Procedure 7 "Install SOAM/MP Host Servers" in reference [2]. 2. Execute Procedure 8 "Create, IPM and Install Application on Virtual Machines in reference [2].

7 ☐	Configure MP Host Server On Primary NOAMP Select… **Main Menu** → **Configuration** → *Servers*	1. Select the new SOAM Server (part of MP Host Server) 2. Select the Export dialogue button 3. The configuration file will be created and stored in the /var/TKLC/db/filemgmt directory. The configuration file will have a file name like TKLCConfigData.<*hostname*>.sh. 4. Execute one of the procedures in Appendix K. Applying Server Configuration in reference [2] for new SOAM server. 5. Repeat for the two MPs that are part of the MP Host Server.
8 ☐	Add new MP Host server (1 SOAM and 2 MPs) to appropriate server groups	1. Select [Main Menu: Configuration → Server Groups] screen. 2. Select SOAM's server group. 3. Click "Edit" button. 4. Under 'SG Inclusion', check the new SOAM 5. Click "Ok" button 6. Select MP server group. 7. Click "Edit" button. 8. Under 'SG Inclusion', check the two new MPs 9. Click "Ok" button 10. Wait at least 5 minutes before continuing with the steps.
9 ☐	Make new MP Host server Active (remove forced standby).	1. Select [Main Menu: Status & Manage → HA] screen 2. Click 'Edit' button 3. Change "Max Allowed HA Role" of the new MP Host server (1 SOAM and 2 MPs) to 'Active' if it's on standby. 4. Click OK button
10 ☐	Restart the application on MP Host server	1. Select [Main Menu: Status & Manage → Server] screen. 2. Verify the "DB" status displays "Norm" and the "Proc" status shows "Man" for the new MP Host server (1 SOAM and 2 MPs) before preceding to the next step. 3. Select the new SOAM and 2 MP servers and then select "Restart" from the bottom left corner of the screen. 4. Click OK button 5. The "Info" tab should contain the confirmation messages stating: "Successfully restarted application" for the SOAM and 2 MPs. 6. Verify that the "Appl State" now shows "Enabled" and the "Proc" status column show "Norm" for the new MP Host Server (1 SOAM and 2 MPs).
11 ☐	(OPTIONAL) ACTIVE NOAM: Re-Sync NTP if Necessary	Navigate to **Status & Manage -> Server**, then select **each** server that has been recovered and click **NTP Sync**.
12 ☐	Verify the Database state of the newly restored server	1. Click on Main Menu->Status and Manage->Database 2. Verify that the OAM Max HA Role is either "Active" or "Standby" or "Spare", and that the status is "Normal". 3. Verify data was synched from the active NOAMP(servers, etc).

13	Configure ComAgent for the Replaced MPs	Execute Procedure 18 in [2]. ("Configure SPR Application on MP")
14	Verify the HA Status	1. Click on Main Menu->Status and Manage->HA 2. Check the MP Host Server (1 SOAM and 2 MPs) 3. Verify that the "Max Allowed HA Role" status is Active.
15	Verify the local node info on the Replaced SOAM	1. Click on Main Menu->Diameter->Configuration->Local Node 2. Verify that all the local nodes are listed.
16	Verify the peer node info on the Replaced SOAM	1. Click on Main Menu->Diameter->Configuration->Peer Node 2. Verify that all the peer nodes are listed.
17	Verify the Connections info on the Replaced SOAM	1. Click on Main Menu->Diameter->Configuration->Connections 2. Verify that all appropriate connections are listed.
18	Re-enable connections if needed on Active SOAM	1. Click on Main Menu->Diameter->Maintenance->Connections 2. Select each connection and click on the "Enable" button 3. Verify that the Operational State is Available.
19	Examine All Alarms	1. Click on Main Menu->Alarms & Events->View Active 2. Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS) [refer to Appendix C.]
20	Backup and archive all the databases from the recovered system	Execute Appendix A "OCUDR 10.0.1 Database Backup" "Replacement of a MP Host Server" is Complete.

End of Procedure

4.2.3 Post Condition

- MP Host server is back in service

4.3 Replacement of a Primary or DR NOAMP Server Pair

Three scenarios are possible here:

- The primary NOAMP servers both failed and there is a DR site.

- The primary NOAMP servers both failed and there is no DR site.

- The DR NOAMP servers both failed.

4.3.1 Primary NOAMP Server Pair Failure with a DR Site

4.3.1.1 Pre-Conditions

- Primary NOAMP active and standby servers failed.
- For Normal Capacity Configurations only.
- It has been determined to replace defective NOAMP servers and the new NOAMP servers are available.
- The DR NOAMP site will automatically be activated and become the primary site. This allows provisioning to continue at the DR NOAMP site temporarily until the primary site is recovered. The appropriate flag is set and control will resume back to the primary site once the first NOAMP is back up. Refer to [9] for more details.

4.3.1.2 Recovery Steps

Procedure 3. Replacement of Primary NOAMP Server Pair with a DR Site

S T E P #	This procedure performs recovery if both NOAMP servers have failed at a site and there is a DR site Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ☐	Recover NOAMP server (1st one)	1. Execute steps 1 - 9 in procedure 1 for the first defective NOAMP.
2 ☐	Control returns back to Primary Site.	1. Control returns back to the NOAMP at the Primary site. 2. Finish steps 10-15 in procedure 1
3 ☐	Recover second NOAMP server	Execute procedure 1.

End of Procedure

4.3.1.3 Post Condition

- Primary NOAMP server pair is back in service

4.3.2 Primary NOAMP Server Pair Failure with no DR Site

4.3.2.1 Pre-Conditions

- Primary NOAMP active and standby servers failed.
- For Normal Capacity Configurations only.
- It has been determined to replace defective NOAMP servers and the new NOAMP servesr are available.
- The servers are restored using database backups since there is no DR site.

4.3.2.2 Recovery Steps

Procedure 4. Replacement of Primary NOAMP Server Pair with no DR Site

S T E P #	This procedure performs recovery if both NOAMP servers have failed at a site and there is no DR site. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ☐	Recover first NOAMP server	1. Execute steps 4-5 in procedure 1. 2. Execute section 8.1 "Configuration NOAMP-A Server" in reference [2].
2 ☐	Copy NOAMP backup archive to new NOAMP server, and perform DB restore from backup file.	1. Login via SSH to the console of new NOAMP server. 2. Copy the uncompressed backup archive identified in step 1 to newly installed NOAMP-A server on this location: **/var/TKLC/db/filemgmt** 3. Execute this command to stop running applications and leave database running: **prod.stop** 4. Restore configuration and provisioning database by executing this command: **idb.restore -n –f –t /var/TKLC/db/filemgmt -v <archive file>** 5. NOAMP database is now restored Start the application by executing this command **prod.start**
3 ☐	Restore /etc/hosts file of active NOAMP	From the recovered NOAMP server command line, execute: **# AppWorks AppWorks_AppWorks updateServerAliases <NOAMP Host Name>** Check /etc/hosts and confirm all servers exist in this file.

4 ☐	Recover second NOAMP server	Execute procedure 1.

End of Procedure

4.3.2.3 Post Condition

- Primary NOAMP server pair is back in service

4.3.3 DR NOAMP Server Pair Failure

4.3.3.1 Pre-Conditions

- DR NOAMP active and standby servers failed at a site.
- For Normal Capacity Configurations only.
- It has been determined to replace defective NOAMP servers and the new NOAMP servers are available.

4.3.3.2 Recovery Steps

Procedure 5. Replacement of DR NOAMP Server Pair

S T E P #	This procedure performs recovery if both DR NOAMP servers have failed at a site. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ☐	Recover first DR NOAMP server	Execute procedure 1.
3 ☐	Recover second DR NOAMP server	Execute procedure 1.

End of Procedure

4.3.3.3 Post Condition

- DR NOAMP server pair is back in service

4.4 Replacement of a MP Host Server Pair

4.4.1 Pre-Conditions

- Active and Standby MP Host Servers have failed at a site.

- For Normal Capacity Configurations only.

- It has been determined to replace defective MP Host servers and the new MP Host servers are available

- SOAM backup archive is needed for Diameter Configuration. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage).

4.4.2 Recovery Steps

Procedure 6. Replacement of a MP Host Server Pair

S T E P #	This procedure performs recovery if both MP Host servers have failed at a site. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1	Recover first MP Host Server	Execute steps 3-12 in procedure 2.
2	On the new SOAM GUI, perform the actions to upload backup archive file and verify it was uploaded successfully.	1. Select Main Menu->Status & Manage->Files 2. Select the Active SOAM Server 3. Click on "Upload" 4. Select the "SOAM Configuration:" file backed up after configuration. 5. Click on the "Upload " button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete. Verify that the SOAM database backup file was uploaded and is located under /var/TKLC/db/filemgmt.
3	Disable Provisioning	1. Click on Main Menu->Status & Manage->Database 2. Disable Provisioning by clicking on "Disable Site Provisioning" button at the bottom of the screen. A confirmation window will appear, press "OK" to disable Provisioning.

4	Execute a restore of SOAM configuration database.	1. Navigate to GUI page [Main Menu: Status & Manage → Database]
		2. Select the active SOAM server. Server is now highlighted.
		3. Click 'Restore' button and select the backup archive file.
		4. GUI will display compatibility information. If databases are not compatible, review and record incompatibility information. If 'server id' within topology check are shown to be incompatible, check 'force' option then click 'OK' to continue with DB restoration, else call My Oracle Support (MOS) [refer to Appendix C.] If 'force' option is used, then configuration data needs manual modifications.
		5. If the databases are compatible, then click 'OK' to continue with database restoration.
		6. Wait for 5 minutes. There will be HA switch over for SOAM servers and you will have to log back in the SOAM GUI via VIP address again. Make sure that you are logging in to the same active server identified in Step 1 above.
5	Re-enable Provisioning	1. Log into the Active NOAMP GUI
		2. Click on Main Menu->Status & Manage->Database menu item.
		3. Click on the "Enable Provisioning" button. A pop-up window will appear to confirm, press OK.
6	Finish MP Host verification for the first server.	Execute steps 13 – 18 in procedure 2.
7	Recover second MP Host Server	Execute procedure 2.

End of Procedure

4.4.3 Post Condition

- MP Host server pair is back in service

4.5 Replacement of a Primary or DR "Server hosting UDR in a box"

4.5.1 Pre-Conditions

- A Primary or DR Server has failed and needs replacement. (Server consists of 1 NOAMP, 1 SOAMP and 1 MP on a single server)
- Low Capacity Configurations only.
- If the active server stopped functioning, the standby server has become active.
- Primary NOAMP and SOAM GUI is accessible.
- It has been determined to replace defective "Server hosting UDR in a box".
- The new "Server hosting UDR in a box" replacement is available.

4.5.2 Recovery Steps

Procedure 7. Replacement of a Primary or DR "Server hosting UDR in a box"

1 ☐	Prepare for server replacement.	Identify the defective server (Consists of 1 NOAMP, 1 SOAM and 1 MP on a single server) that needs to be replaced: Hostname _____
2 ☐	Force defective server to be "Standby" so it does not become active.	1. Login to the NOAMP GUI as admin user using VIP address. 2. Select [Main Menu: Status & Manage → HA] screen 3. Click 'Edit' button 4. Change Server's NOAMP and SOAM to "Max Allowed HA Role" of 'Standby' 5. Click OK button
3 ☐	Remove server from the server groups at active NOAMP.	1. Select [Main Menu: Configuration → Server Groups] screen. 2. Select NOAMP server group 3. Click "Edit" button. 4. Under 'SG Inclusion', uncheck the defective NOAMP server 5. Select SOAM server group. 6. Click "Edit" button. 7. Under 'SG Inclusion', uncheck the defective SOAM server 8. Click "Ok" button 9. Select MP server group. 10. Click "Edit" button. 11. Under 'SG Inclusion', uncheck the defective MP server 12. Click "Ok" button

4 ☐	Power down and replace server.	1. Power down the defective server
		2. Physically remove the server (blade) for the replacement.
		3. Wire in the new server according to the cables you labeled and removed from the old server.
		4. Power up the new server.
5 ☐	Prepare/Install the new server	For Low Capacity C-Class Configuration Only:
		1. Execute Procedure 4 "Install NOAMP/SOAM/MP Host Servers" in reference [2].
		2. Execute Procedure 5 "Create, IPM and Install Application on Virtual Machines in reference [2].
6 ☐	Prepare/Install the new server	For Low Capacity RMS Configuration Only:
		1. Execute Procedure 9 "Install NOAMP/SOAM/MP Host Servers" in reference [2].
		2. Execute Procedure 10 "Create, IPM and Install Application on Virtual Machines in reference [2].
7 ☐	Configure Server On Primary NOAMP Select… **Main Menu** → **Configuration** → *Servers*	1. Select the new NOAMP Server
		2. Select the Export dialogue button
		3. The configuration file will be created and stored in the /var/TKLC/db/filemgmt directory. The configuration file will have a file name like TKLCConfigData.<*hostname*>.sh.
		4. Execute one of the procedures in Appendix K. Applying Server Configuration in reference [2] for new NOAMP.
		5. Repeat for the SOAM and the MP that is part of the "Server hosting UDR in a box".
8 ☐	Add new server (consists of 1 NOAMP, 1 SOAM and 1 MP) to appropriate server groups	1. Select [Main Menu: Configuration → Server Groups] screen.
		2. Select NOAMP's server group.
		3. Click "Edit" button.
		4. Under 'SG Inclusion', check the new NOAMP
		5. Click "Ok" button
		6. Select SOAM's server group.
		7. Click "Edit" button.
		8. Under 'SG Inclusion', check the new SOAM
		9. Click "Ok" button
		10. Select MP server group.
		11. Click "Edit" button.
		12. Under 'SG Inclusion', check the new MP
		13. Click "Ok" button
		14. Wait at least 5 minutes before continuing with the steps.
9 ☐	Make new server Active (remove forced standby).	1. Select [Main Menu: Status & Manage → HA] screen
		2. Click 'Edit' button
		3. Change Server's NOAMP/SOAM to "Max Allowed HA Role" of 'Active' if it's on standby.
		4. Click OK button

10 ☐	Restart the application on the server	1. Select [Main Menu: Status & Manage → Server] screen. 2. Verify the "DB" status displays "Norm" and the "Proc" status shows "Man" for the new MP Host server (consists of 1 NOAMP, 1 SOAM and 1 MP) before preceding to the next step. 3. Select the new NOAMP, SOAM and MP server and then select "Restart" from the bottom left corner of the screen. 4. Click OK button 5. The "Info" tab should contain the confirmation messages stating: "Successfully restarted application" for the NOAMP, SOAM and MP. 6. Verify that the "Appl State" now shows "Enabled" and the "Proc" status column show "Norm" for the new Server
11 ☐	**(OPTIONAL) ACTIVE NOAM:** Re-Sync NTP if Necessary	Navigate to **Status & Manage -> Server**, then select **each** server that has been recovered and click **NTP Sync**.
12 ☐	Verify the Database state of the newly restored server	1. Click on Main Menu->Status and Manage->Database 2. Verify that the OAM Max HA Role is either "Active" or "Standby" or "Spare", and that the status is "Normal". 3. Verify data was synched from the active NOAMP(servers, etc).
13 ☐	Configure ComAgent for the Replaced MP	Execute Procedure 18 in [2]. ("Configure SPR Application on MP")
14 ☐	Verify the HA Status	1. Click on Main Menu->Status and Manage->HA 2. Check the Server. Verify that the "Max Allowed HA Role" status is Active.
15 ☐	Verify the local node info on the Replaced SOAM	1. Click on Main Menu->Diameter->Configuration->Local Node 2. Verify that all the local nodes are listed.
16 ☐	Verify the peer node info on the Replaced SOAM	1. Click on Main Menu->Diameter->Configuration->Peer Node 2. Verify that all the peer nodes are listed.
17 ☐	Verify the Connections info on the Replaced SOAM	1. Click on Main Menu->Diameter->Configuration->Connections 2. Verify that all appropriate connections are listed.
18 ☐	Re-enable connections if needed on Active SOAM	1. Click on Main Menu->Diameter->Maintenance->Connections 2. Select each connection and click on the "Enable" button 3. Verify that the Operational State is Available.

19	Examine All Alarms	1. Click on Main Menu->Alarms & Events->View Active
		2. Examine all active alarms and refer to the on-line help on how to address them. If needed contact My Oracle Support (MOS) [refer to Appendix C.]
		The following alarms may appear during the Server replacement and can be ignored:
		• 10009 Config and Prov DB not yet synchronized
		• 19800 Communication Agent Connection Down
		• 19820 Communiation Agent Routed Service Unavailable
		• 13001 No Remote RAS Client Connections
		• 13027 No Remote XSAS Client Connections
20	Backup and archive all the databases from the recovered system	Execute Appendix A "UDR 10.0.1 Database Backup" "Replacement of a Server hosting UDR in a box" is Complete.

End of Procedure

4.5.3 Post Condition

- "Server hosting UDR in a box" is back in service

4.6 Replacement of Primary or DR "Server hosting UDR in a box" Pair

Three scenarios are possible here:

- The primary servers both failed and there is a DR site.
- The primary servers both failed and there is no DR site.
- The DR servers both failed.

4.6.1 Primary "Server hosting UDR in a box" Pair Failure with a DR site

4.6.1.1 Pre-Conditions

- Primary Active and Standby servers failed. ("Server hosting UDR in a box" consists of 1 NOAMP, 1 SOAM and 1 MP).
- Low Capacity Configurations only.
- It has been determined to replace defective servers hosting UDR in a box and the new servers hosting UDR in a box are available.

- The DR NOAMP site will automatically be activated and become the primary site. This allows provisioning to continue at the DR NOAMP site temporarily until the primary site is recovered. The appropriate flag is set and control will resume back to the primary site once the first NOAMP is back up. Refer to [9] for more details.
- SOAM backup archive is needed for Diameter Configuration. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage).

4.6.1.2 Recovery Steps

Procedure 8. Replacement of a Primary "Server hosting UDR in a box" Pair with a DR site

S T E P #	This procedure performs recovery if both MP Host servers have failed at a site. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ☐	Recover first Server	Execute steps 1-9 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box" for the first defective Server.
2 ☐	Control returns back to Primary Site.	1. Control returns back to the NOAMP at the Primary site. 2. Execute steps 10-13 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".
3 ☐	On the new SOAM GUI, perform the actions to upload backup archive file and verify it was uploaded successfully.	1. Select Main Menu->Status & Manage->Files 2. Select the Active SOAM Server 3. Click on "Upload" 4. Select the "SOAM Configuration:" file backed up after configuration. 5. Click on the "Upload " button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete. 6. Verify that the SOAM database backup file was uploaded and is located under /var/TKLC/db/filemgmt.
4 ☐	Disable Provisioning	1. Click on Main Menu->Status & Manage->Database 2. Disable Provisioning by clicking on "Disable Site Provisioning" button at the bottom of the screen. 3. A confirmation window will appear, press "OK" to disable provisioning. **Note:** *As a result of disabling Global Provisioning, Warning (**Event ID 10008**): "Global Provisioning Manually Disabled" will alarm until Global Provisioning is re-enabled.*

5	Execute a restore of SOAM configuration database.	1. Navigate to GUI page [Main Menu: Status & Manage → Database]
		2. Select the active SOAM server. Server is now highlighted.
		3. Click 'Restore' button and select the backup archive file.
		4. GUI will display compatibility information. If databases are not compatible, review and record incompatibility information. If 'server id' within topology check are shown to be incompatible, check 'force' option then click 'OK' to continue with DB restoration, else call My Oracle Support (MOS) [refer to Appendix C.] If 'force' option is used, then configuration data needs manual modifications.
		5. If the databases are compatible, then click 'OK' to continue with database restoration.
		6. Wait for 5 minutes. There will be HA switch over for SOAM servers and you will have to log back in the SOAM GUI via VIP address again. Make sure that you are logging in to the same active server identified in Step 1 above.
6	Re-enable Provisioning	1. Log into the Active NOAMP GUI
		2. Click on Main Menu->Status & Manage->Database menu item.
		3. Click on the "Enable Provisioning" button. A pop-up window will appear to confirm, press OK.
		Note: *As a result of enabling Global Provisioning, Warning (**Event ID 10008**): "Global Provisioning Manually Disabled" will clear.*
7	Finish verification for the first server.	Finish steps 14-19 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".
8	Recover second Server	Execute procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".

End of Procedure

4.6.1.1 Post Condition

- "Server hosting UDR in a box" Pair is back in service

4.6.2 Primary "Server hosting UDR in a box" Pair Failure without a DR site

4.6.2.1 Pre-Conditions

- Primary Active and Standby servers failed.

- Low Capacity Configurations only.

- It has been determined to replace defective "server hosting UDR in a box" pair and the new servers are available

- The servers are restored using database backups since there is no DR site.

4.6.2.2 Recovery Steps

Procedure 9. Replacement of a Primary Server "hosting UDR in a box" Pair without a DR site

S T E P #	This procedure performs recovery if both MP Host servers have failed at a site. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1	Recover first Server	Execute steps 1-9 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box" for the first defective Server.
2	Copy NOAMP backup archive to new NOAMP server, and perform DB restore from backup file.	1. Login via SSH to the console of new NOAMP server. 2. Copy the uncompressed backup archive identified in step 1 to newly installed NOAMP-A server on this location: **/var/TKLC/db/filemgmt** 3. Execute this command to stop running applications and leave database running: 4. **prod.stop** 5. Restore configuration and provisioning database by executing this command: **idb.restore -n –f –t /var/TKLC/db/filemgmt -v <archive file>** 6. NOAMP database is now restored Start the application by executing this command **prod.start**
3	**Restore /etc/hosts file of active NOAMP**	From the recovered NOAMP server command line, execute: **# AppWorks AppWorks_AppWorks updateServerAliases <NOAMP Host Name>** Check /etc/hosts and confirm all servers exist in this file.

4 ☐	On the new SOAM GUI, perform the actions to upload backup archive file and verify it was uploaded successfully.	1. Select Main Menu->Status & Manage->Files 2. Select the Active SOAM Server 3. Click on "Upload" 4. Select the "SOAM Configuration:" file backed up after configuration. 5. Click on the "Upload " button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete. 6. Verify that the SOAM database backup file was uploaded and is located under /var/TKLC/db/filemgmt.
5 ☐	Disable Provisioning	1. Click on Main Menu->Status & Manage->Database 2. Disable Provisioning by clicking on "Disable Site Provisioning" button at the bottom of the screen. 3. A confirmation window will appear, press "OK" to disable Provisioning.
6 ☐	Execute a restore of SOAM configuration database.	1. Navigate to GUI page [Main Menu: Status & Manage → Database] 2. Select the active SOAM server. Server is now highlighted. 3. Click 'Restore' button and select the backup archive file. 4. GUI will display compatibility information. If databases are not compatible, review and record incompatibility information. If 'server id' within topology check are shown to be incompatible, check 'force' option then click 'OK' to continue with DB restoration, else call My Oracle Support (MOS) [refer to Appendix C.] If 'force' option is used, then configuration data needs manual modifications. 5. If the databases are compatible, then click 'OK' to continue with database restoration. 6. Wait for 5 minutes. There will be HA switch over for SOAM servers and you will have to log back in the SOAM GUI via VIP address again. Make sure that you are logging in to the same active server identified in Step 1 above.
7 ☐	Re-enable Provisioning	1. Log into the Active NOAMP GUI 2. Click on Main Menu->Status & Manage->Database menu item. 3. Click on the "Enable Provisioning" button. A pop-up window will appear to confirm, press OK.
8 ☐	Finish verification for the first server.	Finish steps 10-19 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".
9 ☐	Recover second Server	Execute procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".

End of Procedure

4.6.2.3 Post Condition

- "Server hosting UDR in a box" Pair is back in service

4.6.3 DR "Server hosting UDR in a box" Pair Failure

4.6.3.1 Pre-Conditions

- DR servers failed at a site.
- Low Capacity Configurations only.
- It has been determined to replace defective "Server hosting UDR in a box" pair and the new servers are available.
- SOAM backup archive is needed for Diameter Configuration. These should be taken from Customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage).

4.6.3.2 Recovery Steps

Procedure 10. Replacement of a DR "Server hosting UDR in a box" Pair

S T E P #	This procedure performs recovery if both DR NOAMP servers have failed at a site. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ☐	Recover first DR server	Execute steps 1-13 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box" for first defective DR Server.
2 ☐	On the new SOAM GUI, perform the actions to upload backup archive file and verify it was uploaded successfully.	1. Select Main Menu->Status & Manage->Files 2. Select the Active SOAM Server 3. Click on "Upload" 4. Select the "SOAM Configuration:" file backed up after configuration. 5. Click on the "Upload " button. The file will take a few seconds to upload depending on the size of the backup data. The file will be visible on the list of entries after the upload is complete. 6. Verify that the SOAM database backup file was uploaded and is located under /var/TKLC/db/filemgmt.
3 ☐	Disable Provisioning	1. Click on Main Menu->Status & Manage->Database 2. Disable Provisioning by clicking on "Disable Site Provisioning" button at the bottom of the screen. 3. A confirmation window will appear, press "OK" to disable Provisioning.

4 ▢	Execute a restore of SOAM configuration database.	1. Navigate to GUI page [Main Menu: Status & Manage → Database]
		2. Select the active SOAM server. Server is now highlighted.
		3. Click 'Restore' button and select the backup archive file.
		4. GUI will display compatibility information. If databases are not compatible, review and record incompatibility information. If 'server id' within topology check are shown to be incompatible, check 'force' option then click 'OK' to continue with DB restoration, else call My Oracle Support (MOS) [refer to Appendix C.] If 'force' option is used, then configuration data needs manual modifications.
		5. If the databases are compatible, then click 'OK' to continue with database restoration.
		6. Wait for 5 minutes. There will be HA switch over for SOAM servers and you will have to log back in the SOAM GUI via VIP address again. Make sure that you are logging in to the same active server identified in Step 1 above.
5 ▢	Re-enable Provisioning	1. Log into the Active NOAMP GUI
		2. Click on Main Menu->Status & Manage->Database menu item.
		3. Click on the "Enable Provisioning" button. A pop-up window will appear to confirm, press OK.
6 ▢	Finish verification for the first server.	Finish steps 14-19 in procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".
7 ▢	Recover second DR server	Execute procedure 7: Replacement of a Primary or DR "Server hosting UDR in a box".

End of Procedure

4.6.3.1 Post Condition

- "Server hosting UDR in a box" Pair is back in service

4.7 Replacement of Primary or DR OCUDR Site

For a complete site outage, NOAMP and MP Host servers or Servers hosting UDR in a box are recovered using recovery procedures of base hardware and software. A database restore to the active NOAMP server is necessary if no DR site is available. A database restore is used to quickly recover provisioning and configuration data on the active servers. Database replication from the primary active NOAMP/SOAM servers will recover the database on the standby/spare servers. SOAM backup archive is needed for Diameter Configuration.

4.7.1 Pre-Conditions

- A combined NOAMP + MP Host frame or "Server hosting UDR in a box" frame is destroyed.
- A replacement NOAMP + MP Host frame or "Server hosting UDR in a box" frame is available.
- For Normal or Low Capacity Systems.
- A DR site may or may not be available.
- If DR site is available refer to [9] for details of automatic transfer to DR NO.
- If no DR site is available and for SOAM servers, database backups will be taken from customer offsite backup storage locations (assuming these were performed and stored offsite prior to the outage). The servers are then restored using these database backups to the active NOAMP and SOAM servers.

4.7.2 Recovery Steps

Procedure 11. Replacement of NOAMP + MP Host Frame

S T E P #	This procedure performs recovery if both NOAMP servers and both MP Host servers have failed. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1 ▢	Install new replacement frame	Follow procedures in reference [3] to install the new NOAMP + MP Host frame.
2 ▢	Configure switch 1A	Follow recovery steps in Appendix B for replacement of Cisco aggregation switch. **Note:** *aggregation switches are usually located at the top of the frame for aggregating HP c-Class enclosures. It is only deployed with Topology 1 deployments.*
3 ▢	Configure switch 1B	Follow recovery steps in Appendix B for replacement of Cisco aggregation switch. **Note:** *aggregation switches are usually located at the top of the frame for aggregating HP c-Class enclosures. It is only deployed with Topology 1 deployments.*

Procedure 11. Replacement of NOAMP + MP Host Frame

4	Configure Enclosure switches	Follow recovery steps in Appendix B to recover Enclosure switches. **Note:** *enclosure switches sit inside the HP c-Class enclosure and 'aggregate' blades but not the enclosures (typically).*
5	For Low Capacity Configurations only: Recover Primary or DR Server	For replacement of primary or DR Server pair, follow appropriate procedure in section 4.6: Replacement of Primary or DR "Server hosting UDR in a box" Pair: • Procedure 8 for Primary "Server hosting UDR in a box" Pair Failure with a DR site OR • Procedure 9 for • Primary "Server hosting UDR in a box" Pair Failure without a DR site OR • Procedure 10 for DR "Server hosting UDR in a box" Pair Failure
6	For Normal Capacity Configurations Only: Recover primary or DR NOAMP pair.	Follow appropriate procedure in section 4.3: • Procedure 3 for Primary NOAMP Server Pair Failure with a DR Site • Procedure 4 for Primary NOAMP Server Pair Failure with no DR Site • Procedure 5 for DR NOAMP Server Pair Failure
7	For Normal Capacity Configurations Only: Recover MP Host Server Pair	Execute procedure 6.
8	Restore GUI Usernames and passwords	If applicable, Execute steps in Section 5 to recover the user and group information restored.

End of Procedure

4.7.3 Post Condition

• Primary or DR NOAMP+MP Host frame is back in service

5   RESOLVING USER CREDENTIAL ISSUES AFTER DATABASE RESTORE

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

5.1 Restoring a Deleted User

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

These users were removed prior to creation of the backup and archive file. They will be reintroduced by system restoration of that file.

5.1.1 To Keep the Restored User

Perform this step to keep users that will be restored by system restoration.

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

After restoration
- Log in and reset the passwords for all users in this category.

1. Navagate to the user administration screen.

Main Menu: Administration -> Access Control -> Users

2. Select the user.

3. Click the Change Password button.

4. Enter a new password.

New Password: ●●●●●●●●●
Re-type New Password: ●●●●●●●●●

5. Click the Continue button.

5.1.2 To Remove the Restored User

Perform this step to remove users that will be restored by system restoration.

After restoration, delete all users in this category.
1. Navagate to the user administration screen.

Main Menu: Administration -> Access Control -> Users

2. Select the user.

3. Click the Delete button.

4. Confirm.

5.2 Restoring a Modified User

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

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

Before restoration,
- Verify that you have access to a user with administrator permissions that is not affected.

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

After restoration
- Log in and reset the passwords for all users in this category. See the steps in section 5.1.1 for resetting passwords for a user.

5.3 Restoring an Archive that Does not Contain a Current User

These users have been created after the creation of the backup and archive file. This will be 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.

To re-create the user, do the following:

Before restoration,
- Verify that you have access to a user with administrator permissions that is not affected.

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

- Log in and record the username, group, timezone, comment, and enabled values for each affected user.

After restoration

- Log in and re-create each of the affected users using the information recorded above

1. Navagate to the user administration screen.

Main Menu: Administration -> Access Control -> Users

2. Click the Add New User button.

Add New User

3. Re-populate all the data for this user.

Username: addthisuser (5-16 characters)
Group: noalarm
Time Zone: UTC
Comment: This user was created after the last backup (max 64 characters)
Temporary Password: ●●●●●●●●●●●● (8-16 characters)
Re-type Password: ●●●●●●●●●●●● (8-16 characters)

4. Click the OK button.

Ok

- Reset the passwords for all users in this category. See the steps in section 5.1.1 for resetting passwords for a user.

Appendix A.   OCUDR 10.0.1 Database Backup

Procedure 12: OCUDR 10.0.1 Database Backup

S T E P #	The intent of this procedure is to backup the provision and configuration information from an NOAMP or SOAMP server after the disaster recovery is complete and transfer it to a secure location accessible to TAC. Prerequisites for this procedure are: ▪ Network connectivity to the NOAMP XMI address via VPN access to the Customer's network. ▪ OCUDR 10.0.1 "guiadmin" user password. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1.	Login into NOAMP (or SOAM) XMI VIP IP Address	Login using the "guiadmin" credentials.
2.	Backup Configuration data for the system.	1. Browse to Main Menu->Status & Manage->Database screen 2. Select the Active NOAMP (or SOAM) Server and Click on "Backup" button. 3. Make sure that the checkboxes next to Provisioning and Configuration are checked. Then enter a filename for the backup and press "OK". 4. This may take 5-10 minutes or so to backup.
3. ☐	Verify the back up file availability.	1. Browse to Main Menu-> Status & Manage->Files 2. Select the Active NOAMP (or SOAM) and click on "File Name" 3. The files on this server file management area will be displayed in the work area. 4. Verify the existence of the backed up configuration back up file.
4. ☐	Download the file to local machine.	1. Click on the file link and click on the download button **2.** File download dialog box will be displayed, click on the save button and save it to local machine:
5. ☐	Upload the image to secure location for future disaster recovery of entire system.	Transfer the backed up image saved in the previous step to a secure location where the Server Backup files are fetched in case of system disaster recovery.
6. ☐	Backup Active SOAM	Repeat Steps 2 through 5 to backup the Active SOAM. The database backup of the OCUDR 10.0.1 is complete.

Appendix B.   Recovering/Replacing a Failed 3rd party component (Switches, OAs)

Procedure 13: Recovering a failed PM&C Server

S T E P #	The intent of this procedure is to recover a failed PM&C Server Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	
1.		Refer to [5] *PM&C Disaster Recovery* on instructions how to recover a PM&C Server.

Procedure 14: Recovering a failed Aggregation Switch (Cisco 4948E / 4948E-F)

S T E P #	The intent of this procedure is to recover a failed Aggregation (4948E / 4948E-F) Switch.
	
	Prerequisites for this procedure are:
	  ▪ A copy of the networking xml configuration files
	
	  ▪ A copy of HP Misc Firmware DVD or ISO
	
	  ▪ IP address and hostname of the failed switch
	
	  ▪ Rack Mount position of the failed switch
	
	Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.
	
	Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.	

1.		1. Remove the old SSH key of the switch from the PMAC by executing the following command from a PMAC command shell: **sudo ssh-keygen -R <4948_switch_ip>** 2. Refer to [4], procedure "**Replace a failed 4948/4948E/4948E-F switch (c-Class system) (netConfig)**", to replace a failed Aggregation switch. You will need a copy of the HP Misc Firmware DVD or ISO of the original networking xml files custom for this installation. These will either be stored on the PM&C in a designated location, or can be obtained from the NAPD.

Procedure 15: Recovering a failed Enclosure Switch (Cisco 3020)

S T E P #	The intent of this procedure is to recover a failed Enclosure (3020) Switch.
	
	Prerequisites for this procedure are:
	   ▪ A copy of the networking xml configuration files
	
	   ▪ A copy of HP Misc Firmware DVD or ISO
	
	   ▪ IP address and hostname of the failed switch
	
	   ▪ Interconnect Bay position of the enclosure switch
	
	Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.
	
	Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.

1.	1. Remove the old SSH key of the switch from the PMAC by executing the following command from a PMAC command shell: **sudo ssh-keygen -R <enclosure_switch_ip>** 2. Refer to [4], procedure "**Reconfigure a failed 3020 switch(netConfig)**", to replace a failed Enclosure switch. You will need a copy of the HP Misc Firmware DVD or ISO and of the original networking xml files custom for this installation. These will either be stored on the PM&C in a designated location, or can be obtained from the NAPD.

Procedure 16: Recovering a failed Enclosure Switch (HP 6120XG)

S T E P #	The intent of this procedure is to recover a failed Enclosure (6120XG) Switch.
	
	Prerequisites for this procedure are:
	   ▪ A copy of the networking xml configuration files
	
	   ▪ IP address and hostname of the failed switch
	
	   ▪ Interconnect Bay position of the enclosure switch
	
	A copy of HP Misc Firmware DVD or ISO Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.
	
	Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.

1.	1. Remove the old SSH key of the switch from the PMAC by executing the following command from a PMAC command shell: **sudo ssh-keygen -R <enclosure_switch_ip>** 2. Refer to [4], procedure "**Reconfigure a failed HP 6120XG switch (netConfig)**", to replace a failed Enclosure switch. You will need a copy of the HP Misc Firmware DVD or ISO and of the original networking xml files custom for this installation. These will either be stored on the PM&C in a designated location, or can be obtained from the NAPD.

Procedure 17: Recovering a failed Enclosure Switch (HP 6125XG)

S T E P #	The intent of this procedure is to recover a failed Enclosure (6125XG) Switch. Prerequisites for this procedure are: A copy of the networking xml configuration files A copy of HP Misc Firmware DVD or ISO Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.
1.	1. Remove the old SSH key of the switch from the PMAC by executing the following command from a PMAC command shell: **sudo ssh-keygen -R <enclosure_switch_ip>** 2. Refer to [4], procedure "**Reconfigure a failed HP 6125XG switch (netConfig)**", to replace a failed Enclosure switch. You will need a copy of the HP Misc Firmware DVD or ISO and of the original networking xml files custom for this installation. These will either be stored on the PM&C in a designated location, or can be obtained from the NAPD.

Procedure 18: Recovering a failed Enclosure OA

S T E P #	The intent of this procedure is to recover a failed Enclosure Onboard Administrator Switch. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact My Oracle Support (MOS) [refer to Appendix C] and ask for assistance.
1.	Refer to [4], procedure "**Replacing Onboard Administrator in a system with redundant OA"** to replace a failed Enclosure OA.

Appendix C.   Contacting 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 2 for Non-technical issue

You will be connected to a live agent who can assist you with MOS registration and provide Support Identifiers. Simply mention you are a Tekelec Customer new to MOS.

MOS is available 24 hours a day, 7 days a week, 365 days a year.