5200 Paramount Parkway
Morrisville, NC 27560 USA

Oracle CGBU

User's Guide

HLR Router 4.1 Software Upgrade

(T1200 / HP)

E74583-02

July 2016

Errors made during these procedures may critically impact product operational readiness! These procedures should only be executed by highly skilled personnel who are very familiar with HLR Router Administration and Maintenance.

***It is also recommended that My Oracle Support (MOS) be notified in advance of executing these procedures on a Production network. Refer to Appendix J - Accessing My Oracle Support (MOS),* for more information on contacting Oracle Customer Service.**

Tekelec HLR Router 4.1, Upgrade User's Guide

CAUTION: Before installing any system, please access My Oracle Support (MOS) and review any Technical Service Bulletins (TSBs) that relate to these procedures.

My Oracle Support (MOS) 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.

Refer to ***Appendix J*** - *Accessing My Oracle Support (MOS),* for more information on contacting Oracle Customer Service.

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1. INTRODUCTION

1.1 Purpose and Scope

This document describes methods and procedures to perform an application software upgrade on in-service servers of a Tekelec HLR Router network from software release 4.0.0-40.x.0 to a 4.1.0-41.y.0 or release 4.1.0-41.x.0 to 4.1.0-41.y.0. The audience for this document includes Oracle's customers as well as the Tekelec HLR Router personnel and Global Software Delivery. This document provides step-by-step instructions to execute any Release 4.1.x software upgrade.

The Tekelec HLR Router software includes Oracle's Tekelec Platform Distribution (TPD) software. Any TPD upgrade that is necessary is automatically performed as part of the Tekelec HLR Router software upgrade. The execution of this procedure assumes that all Firmware, TVOE and PM&C upgrade have been completed as required prior to upgrading the HLR Router Application. This procedure also assumes that the Tekelec HLR Router Application software ISO file has been previously downloaded from Oracle Software Delivery Cloud (OSDC).

The new HLRR 4.1 release introduces the following new upgrade features:

- **Server Group-Based automated upgrade (19114416)**

This feature allows the user to perform the auto-upgrade of all servers within the same Server Group. If the "serial" mode is chosen during the auto-upgrade, then the standby server will be upgraded first, and the active server will be upgraded last.

1.2 References

[1] HLRR 4.1 Initial Installation and Configuration Guide for HP, E56461
[2] HLRR 4.1 Initial Installation and Configuration Guide for T1200, E56462
[3] T1200 Solutions Firmware Upgrade Pack, Release Notes, 909-6084-001 or latest approved
[4] T1200 Solutions Firmware Upgrade Pack, Upgrade Procedures, 909-1618-001 or latest approved
[5] HP Solutions Firmware Upgrade Pack, Release Notes, E64919 or latest approved
[6] HP Solutions Firmware Upgrade Pack, Upgrade Procedures, E64920 or latest approved
[7] Platform 7.0 Configuration Guide, E53486
[8] PMAC Incremental Upgrade Procedure, E54387
[9] TVOE 3.0.0.0.0 Software Upgrade Procedure, E53018

1.3 Acroynms

Acronym	Meaning
CGBU	Communications Global Business unit
CSV	Comma-separated Values
DB	Database
DP	Database Processor
DR	Disaster Recovery
EXHR	Tekelec HLR Router
GA	General Availability
GUI	Graphical User Interface
HA	High Availability
IMI	Internal Management Interface
IPM	Initial Product Manufacture
ISO	ISO 9660 file system (when used in the context of this document)
LA	Limited Availability
MOP	Method of Procedure
MP	Message Processing or Message Processor
NE	Network Element
NO	Network OAM&P
NOAM	Network OAM&P
OAM	Operations, Administration and Maintenance
OAM&P	Operations, Administration, Maintenance and Provisioning
SO	System OAM
SOAM	System OAM
TPD	Tekelec Platform Distribution
UI	User Interface
VIP	Virtual IP
VPN	Virtual Private Network
XMI	External Management Interface
XSI	External Signaling Interface

Table 1 - Acronyms

1.4 Terminology

This section describes terminology as it is used within this document.

Term	Meaning
Upgrade	The process of converting an application from its current release on a System to a newer release.
Major Upgrade	An upgrade from a current major release to a newer major release. An example of a major upgrade is: SOME_APPLICATION 4.0.0_40.1.0 to 4.1.0_41.1.0
Incremental Upgrade	An upgrade from a current build to a newer build within the same major release. An example of an incremental upgrade is: SOME_APPLICATION 4.1.0_41.1.0 to 4.1.0_41.2.0.
Software Only Upgrade	An upgrade that does not require a Database Schema change, only the software is changed.
Single Server Upgrade	The process of converting an HLRR server from its current release on a single server to a newer release.
Backout	The process of converting a single HLRR server to a prior version. This could be performed due to failure in Single Server Upgrade.
Rollback	Automatic recovery procedure that puts a server into its pre-upgrade status. This procedure occurs automatically during upgrade if there is a failure.
Source Release	Software release to upgrade from.
Target Release	Software release to upgrade to.
Health Check	Procedure used to determine the health and status of the network. This includes statuses displayed from the GUI. This can be observed Pre-Server Upgrade, In-Progress Server Upgrade, and Post-Server Upgrade.
Upgrade Ready	State that allows for graceful upgrade of a server without degradation of service. It is a state that a server is required to be in before it can be upgraded. The state is defined by the following attributes: • Server is Forced Standby • Server is Application Disabled (Signaling servers will not process any traffic)
UI	User interface. “Platcfg UI” refers specifically to the Platform Configuration Utility User Interface, which is a text-based user interface.

Table 2 - Terminology

1.5 How to use this Document

When executing this document, there are a few key points which help to ensure that the user understands the author’s intent. These points are as follows;

1) Before beginning a procedure, completely read the instructional text (it will appear immediately after the Section heading for each procedure) and all associated procedural WARNINGS or NOTES.
2) Before execution of a STEP within a procedure, completely read the left and right columns including any STEP specific WARNINGS or NOTES.
3) If a procedural STEP fails to execute successfully or fails to receive the desired output, **STOP** and refer to **Appendix J:** *Accessing My Oracle Support (MOS)* for assistance before attempting to continue.

1.6 Executing Procedures

The user should be familiar with the structure and conventions used within these procedures before attempting execution. **Table 3** and the details below provide an example of how procedural steps might be displayed within this document.

Column 1: **Step**

- **Table 3**, Column 1, contains the Step number and also a checkbox if the step requires action by the user.
- Sub-steps within a given Step X are referred to as Step X.Y. (See example: Step 1 has sub-steps Steps 1.1 to 1.2).
- Each checkbox should be checked-off in order to keep track of the progress during execution of the procedure.

Column 2: **Procedure**

- **Table 3**, column 2, contains a heading which indicates the server/IP being accessed as well as text instructions and/or notes to the user. This column may also describe the operations to be performed or observed during the step.

Column 3: **Result**

- **Table 3**, column 3, generally displays the results of executing the instructions (shown in column 2) to the user.
- The Result column may also display any of the following:
  - Inputs (commands or responses) required by the user.
  - Outputs which should be displayed on the terminal.
  - Illustrations or graphic figures related to the step instruction.
  - Screen captures from the product GUI related to the step instruction.

Procedure X: Verifying the Time in GMT

Step	Procedure	Result
1. ☐	**Active Provisioning Site VIP:** Log into the server as the "**admusr**" user.	login: **admusr** Password: **<admusr_password>**
2. ☐	**Active Provisioning Site VIP:** Output similar to that shown on the right will appear as the server returns to a command prompt.	***** TRUNCATED OUTPUT ***** VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds PROMPATH=/opt/comcol/prod RUNID=00 $
3. ☐	**Active Provisioning Site VIP:** Verify that the correct Date & Time are displayed in **GMT** (+/- 4 min.).	$ **date -u** Mon Jan 26 16:34:38 UTC 2015
THIS PROCEDURE HAS BEEN COMPLETED		

Table 3 - Sample Procedure

1.7 Activity Logging

All activity while connected to the system should be logged using a convention which notates the **Customer Name**, **Site/Node** location, **Server Hostname** and the **Date**. All logs should be provided to "My Oracle Support" (MOS) for archiving post upgrade.

1.8 Use of Health Checks

The user may execute the **Perform Health Check** or **View Logs** steps freely or repeat as many times as desired in between procedures during the upgrade process. It is not recommended to do this in between steps within a procedure, unless there is a failure to troubleshoot.

1.9 Large Installation Support

For large systems containing multiple Signaling Network Elements, it may not be feasible to apply the software upgrade to every Network Element within a single maintenance window. However, the Primary HLRR site and DR HLRR site network elements are always required to be upgraded within the same maintenance window.

2. GENERAL DESCRIPTION

This document defines the step-by-step actions performed to execute a software upgrade of an in-service HLR Router from the **"source"** release to the **"target"** release.

2.1 Supported Upgrade Paths

The supported HLR Router upgrade paths are shown below in **Figure 1**.

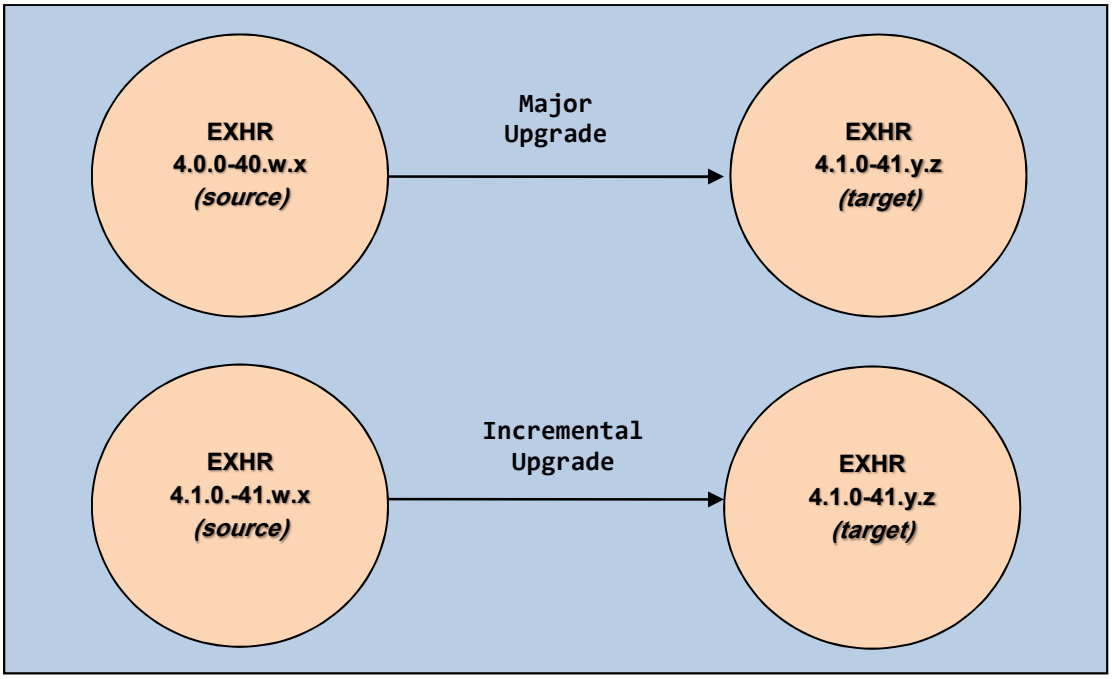


Figure 1: Supported Upgrade Paths

NOTE: Initial Installation is not within the scope of this upgrade document. For more information about Initial Installation refer to reference **[1]**.

3. UPGRADE OVERVIEW

This section lists the required materials and information needed to execute an upgrade. It also provides a brief timing overview of the activities needed to upgrade the source release software that is installed and running on an HLR Router server to the Target Release software. The approximate time required is outlined in **Sections 3.3- 3.7**. These tables are used to plan and estimate the time necessary to complete your upgrade.

Timing values are estimates only. They estimate the completion time of a step or group of steps for an experienced user. These tables are not to be used to execute procedures. Detailed steps for each procedure begin are provided in **Section 5**.

3.1 Upgrade Requirements

The following levels of access, materials and information are needed to execute an HLRR upgrade:

- Target-release ISO image file (example: 872-2696-101-4.1.0_41.4.0-EXHR-x86_64.iso)
- Firmware for T1200 servers *(T1200 only)*
- Target-release TVOE ISO image file *(HP only)*
- Target-release PM&C ISO image file *(HP only)*
- Firmware HP Rack-Mount Servers *(HP only)*
- Cisco Firmware for 4848E-F Switches *(HP only)*
- VPN access to the customer's network.
- GUI access to the HLR Router NOAM VIP with Administrator privileges.
- SSH/SFTP access to the HLR Router NOAM VIP (XMI) as the "admusr" user.

  NOTE: All logins into the HLRR Active and DR NOAM site servers are made via the External Management Interface VIP (XMI) unless otherwise stated.
- User logins, passwords, IP addresses and other administration information. See **Section 3.1.2**.
- Direct access to server IMI IP addresses from the user's local workstation is allowable in the case of T1200 MP servers.

  NOTE: If direct access to the IMI IP addresses isn't available, then access to target server can be made via a tandem connection through the Active OAM server (i.e. an SSH connection is made to the Active SOAM server's XMI IP address first, then a 2nd SSH connection can be made from that server to the target server's IMI IP address).

3.1.1 ISO Image File

You must obtain a copy of the target release ISO image file. This file is necessary to perform the upgrade.

The HLRR ISO image filename will be in the following format:

Example: 872-2696-101-4.1.0_41.4.0-EXHR-x86_64.iso

***NOTE:** Actual number values may vary between releases.*

Prior to the execution of this upgrade procedure it is assumed that the HLRR ISO image file has already been delivered to the customer's system. The delivery of the ISO image requires that the file be placed on the disk of a local workstation with GUI access to the HLRR Primary NOAM VIP address. It is assumed that the ISO file has already been transferred to the Active Primary HLRR NOAM server prior to starting this upgrade procedure.

3.1.2 Logins, Passwords and Site Information

Obtain all the information requested in the following table. This ensures that the necessary administration information is available prior to an upgrade. Consider the confidential nature of the information recorded in this table. While all of the information in the table is required to complete the upgrade, there may be security policies in place that require secure disposal once the upgrade has been completed.

NE Type	**NE Name†**
Primary HLRR NOAM Site	
DR HLRR NOAM Site	
Software	**Values**
Source Release Level	
Target Release Level	
Target Release ISO file name	
Access Information	**Values**
Primary NOAM Site XMI VIP (**GUI**)	
DR NOAM Site XMI VIP	
HLRR GUI Admin Username and Password	
HLRR “root” user Password	
HLRR “admusr” user Password	
HLRR “platcfg” user Password	
Server iLO Admin Username and Password *(HP only)*	
PM&C GUI Admin Username and Password *(HP only)*	
PM&C user “root” Password *(HP only)*	
PM&C user “admusr” Password *(HP only)*	
PM&C user “PM&Cftpusr” Password *(HP only)*	
RMM Admin Username and Password *(T1200 only)*	

Table 4 - Logins, Passwords and Site Information

3.2 Upgrade Maintenance Windows

!! WARNING !! **It is recommended that SOAM NE sites containing mated Message Processors (MP) be upgraded in separate maintenance windows if at all possible.**

Table 5 - Upgrade Maintenance Windows

Maintenance Window: 1 **Date:** _____ Record the names of the **Primary HLRR** NE site, **DR HLRR NE** site, and server's hostnames to be upgraded during Maintenance Window 1 in the space provided on the right:	**Primary HLRR NOAM NE site name:** _____ ☐ **Primary NOAM Active Server:** _____ ☐ **Primary NOAM Standby Server:**_____ ☐ **Primary NOAM NE Query Server** *(if equipped)*: _____ **DR HLRR NOAM NE site name:** _____ ☐ **DR NOAM Active Server:** _____ ☐ **DR NOAM Standby Server:** _____ ☐ **DR NOAM NE Query Server** *(if equipped)*: _____ • Check-off ☒ the associated **check box** as the upgrade is completed for each server
Maintenance Window: ____ **Date:** _____ Record the name of **SOAM NE** site and its server's hostnames to be upgraded during the Maintenance Window 2 in the spaces provided on the right.	**SOAM NE site name:** _____ ☐ **Active SOAM Server:** _____ ☐ **Standby SOAM Server:** _____ ☐ **MP 1 Server**: _____ ☐ **MP 6 Server**: _____ ☐ **MP 2 Server**: _____ ☐ **MP 7 Server**: _____ ☐ **MP 3 Server**: _____ ☐ **MP 8 Server**: _____ ☐ **MP 4 Server**: _____ ☐ **MP 9 Server**: _____ ☐ **MP 5 Server**: _____ ☐ **MP 10 Server**: _____ • Check-off ☒ the associated **check box** as the upgrade is completed for each server

Maintenance Window: ____ **Date: _____** Record the name of **SOAM NE** site and its server's hostnames to be upgraded during the Maintenance Window 2 in the spaces provided on the right.	**SOAM NE site name: _____** ☐ **Active SOAM Server: _____** ☐ **Standby SOAM Server: _____** ☐ **MP 1 Server**: _____ ☐ **MP 6 Server**: _____ ☐ **MP 2 Server**: _____ ☐ **MP 7 Server**: _____ ☐ **MP 3 Server**: _____ ☐ **MP 8 Server**: _____ ☐ **MP 4 Server**: _____ ☐ **MP 9 Server**: _____ ☐ **MP 5 Server**: _____ ☐ **MP 10 Server**: _____ • Check-off ☒ the associated **check box** as the upgrade is completed for each server
Maintenance Window: ____ **Date: _____** Record the name of **SOAM NE** site and its server's hostnames to be upgraded during the Maintenance Window 2 in the spaces provided on the right.	**SOAM NE site name: _____** ☐ **Active SOAM Server: _____** ☐ **Standby SOAM Server: _____** ☐ **MP 1 Server**: _____ ☐ **MP 6 Server**: _____ ☐ **MP 2 Server**: _____ ☐ **MP 7 Server**: _____ ☐ **MP 3 Server**: _____ ☐ **MP 8 Server**: _____ ☐ **MP 4 Server**: _____ ☐ **MP 9 Server**: _____ ☐ **MP 5 Server**: _____ ☐ **MP 10 Server**: _____ • Check-off ☒ the associated **check box** as the upgrade is completed for each server
Maintenance Window: ____ **Date: _____** Record the name of **SOAM NE** site and its server's hostnames to be upgraded during the Maintenance Window 2 in the spaces provided on the right.	**SOAM NE site name: _____** ☐ **Active SOAM Server: _____** ☐ **Standby SOAM Server: _____** ☐ **MP 1 Server**: _____ ☐ **MP 6 Server**: _____ ☐ **MP 2 Server**: _____ ☐ **MP 7 Server**: _____ ☐ **MP 3 Server**: _____ ☐ **MP 8 Server**: _____ ☐ **MP 4 Server**: _____ ☐ **MP 9 Server**: _____ ☐ **MP 5 Server**: _____ ☐ **MP 10 Server**: _____ • Check-off ☒ the associated **check box** as the upgrade is completed for each server

NOTE: Make copies of this sheet as needed for more additional **SOAM NE** sites

3.3 Upgrade Preparation Overview

The pre-upgrade procedures shown in the following table should be executed prior to the upgrade maintenance window and may be executed outside a maintenance window if desired.

Procedure Number	Procedure Title	Elapsed Time (Hrs:Min)	
		This Step	Cumulative
1	*Requirements Check*	00:15	00:15
2	*ISO Administration*	*	*
3	*Full Database Backup (PROV & COMCOL ENV for All Servers)*	01:15†	†

Table 6 - Upgrade Preparation Procedures

***NOTE:** ISO transfers to the target systems cannot be estimated since times will vary significantly depending on the number of systems and the speed of the network. The ISO transfers to the target systems should be performed prior to the scheduled maintenance window. The user should schedule the required maintenance windows accordingly.

†**NOTE:** *The length of time required to complete the backup of the HLRR Provisioning Database will vary based on the size of the customer database. The user should allow up to 45 minutes for this step to complete.*

3.4 Primary HLRR NOAM / DR HLRR NOAM Upgrade Execution Overview

The procedures shown in the following table are executed inside a maintenance window.

Procedure Number	Procedure Title	Elapsed Time (Hrs:Min)	
		This Step	Cumulative
4	*Upgrade Primary NOAM NE*	02:20 *(Major Upgr.)* 01:10 *(Incremental Upgr.)*	02:20 *(Major Upgr.)* 01:10 *(Incremental Upgr.)*
5	*Upgrade DR NOAM NE*	02:20 *(Major Upgr.)* 01:10 *(Incremental Upgr.)*	04:40 *(Major Upgr.)* 02:20 *(Incremental Upgr.)*

Table 7 - Primary HLRR / DR HLRR Upgrade Procedures

3.5 SOAM Upgrade Execution Overview

The procedures shown in the following table should be executed inside a separate maintenance window.

Procedure Number	Procedure Title	Elapsed Time (Hrs:Min)	
		This Step	Cumulative
6	*Upgrade SOAM NE*	04:40 *(Major Upgr.)* 02:20 *(Incremental Upgr.)*	04:40 *(Major Upgr.)* 02:20 *(Incremental Upgr.)*

Table 8 - SOAM Upgrade Procedures

3.6 Post Upgrade Execution Overview

These procedures are performed only after all sites on network have been upgraded.

Procedure Number	Procedure Title	Elapsed Time (Hrs:Min)	
		This Step	Cumulative
7	*Upgrade Acceptance*	00:30	00:30

Table 9 - Post Upgrade Procedures

3.7 Recovery Procedures Overview

These procedures are customized to the specific situation encountered and therefore do not have well established timeframes.

The best time estimates are shown below:

- Backout of NOAM NE ≈ (Upgrade NOAM NE estimate + 20 minutes)
- Backout of SOAM NE ≈ (Upgrade SOAM NE estimate + 40 minutes)

Procedure Number	Procedure Title	Elapsed Time (Hrs:Min)	
		This Step	Cumulative
8	*Backout of a SOAM NE*	05:20 *(Major Upgr.)* 03:00 *(Incremental Upgr.)*	05:20 *(Major Upgr.)* 03:00 *(Incremental Upgr.)*
9	*Backout of the DR NOAM NE*	02:40 *(Major Upgr.)* 01:30 *(Incremental Upgr.)*	02:40 *(Major Upgr.)* 01:30 *(Incremental Upgr.)*
10	*Backout of the Primary NOAM NE*	02:40 *(Major Upgr.)* 01:30 *(Incremental Upgr.)*	05:20 *(Major Upgr.)* ‡ 03:00 *(Incremental Upgr.)* ‡

Table 10 - Backout Procedures

‡ **NOTE:** *This cumulative value includes on the Primary & DR NOAM sites as SOAM activity is typically handled in a separate Maintenance Window.*

4. HLR ROUTER UPGRADE MATRIX

Upgrading the HLR Router product in the customer network is a task which requires multiple procedures of varying types. The matrix shown below provides a guide to the user as to which procedures are to be performed on which site types. As always, the user should contact Oracle's Tekelec Customer Care Center for the assistance if experiencing difficulties with the interpretation or execution of any of the procedures listed.

NOTE: Primary HLRR and DR HLRR sites must be upgraded in the same maintenance window.

HLR Router Upgrade Matrix

		Procedure						
Network Element Type		**1**	**2*†**	**3**	**4***	**5†**	**6*†**	**7**
☐	**Primary NOAM NE DR NOAM NE *(NOAM / Query Server)***	✓	✓	✓	✓	✓	✗	✓
☐	**SOAM NE *(SOAM / MP)***	✓	✗	✗	✗	✗	✓	✓

Table 11 - HLRR Upgrade Matrix

* **Appendix B *(Health Check Procedures)*** is executed before starting this procedure.
† **Appendix B *(Health Check Procedures)*** is executed after completing this procedure.

HLR Router Upgrade: List of Procedures

Table 12 - HLR Router Upgrade: List of Procedures

5. UPGRADE PREPARATION

This section provides detailed procedures to prepare a system for upgrade execution. These procedures may be executed outside of a maintenance window.

5.1 Requirements Check

This procedure verifies that all required materials needed to perform an upgrade have been collected and recorded.

Procedure 1: Requirements Check

Step	Procedure	Result
1. ☐	Verify that all Upgrade requirements have been met.	• Requirements are listed in **Section 3.1**: *(Upgrade Requirements)*. Verify that all Upgrade requirements have been met.
2. ☐	Verify all administration data needed during upgrade.	• Verify that all information in **Section 3.1.2** *(Logins, Passwords and Site Information)* has been entered and is accurate.

5.2 Review Release Notes

Before starting the upgrade, you must review the Release Notes for the new HLRR target release to understand the functional differences (if any) and possible impacts to the upgrade. When upgrading HLR Router to the target release, the list of alarms that may be reported on the GUI during the period of time when the Primary HLRR NOAM NE is at the new software level and the DR NOAM HLRR NE is at the old software level may include but are not limited to the following:

- 31124: A DB replication audit command detected errors
- 31105: The DB merge process (inetmerge) is impaired by a s/w fault

These alarms are only seen in transition and should cease to be raised once the DR NOAM NE is upgraded to the same software level as the Primary NOAM NE.

5.3 Prerequisite Procedures for HLRR Application Upgrade

5.3.1 Perform Firmware Verification *(T1200 / HP)*

This procedure is part of Software Upgrade Preparation and is used to determine the whether a firmware update is required. If a new Firmware revision has been approved for release, follow its instructions to verify that the firmware on the HLRR servers has been upgraded to the target release. The user is instructed to execute Firmware upgrade procedures to target release as required prior to starting the HLR Router Application Upgrade.

☐ **HP only:** **1)** Verify target Firmware release in accordance with reference [5].

2) Execute Firmware upgrade as required in accordance with reference [6].

☐ **T1200 only:** **1)** Verify target Firmware release in accordance with reference [3].

2) Execute Firmware upgrade as required in accordance with reference [4].

5.3.2 Perform TVOE Upgrades *(HP only)*

☐ Execute **TVOE** upgrades for all HLRR Rack-Mount Servers in accordance with reference [9] prior to starting the HLR Router Application Upgrade.

5.3.3 Perform PMAC Upgrades *(HP only)*

☐ Execute **PMAC** upgrades for all HLRR **NOAM-A** Rack-Mount Servers in accordance with reference [8] prior to starting the HLR Router Application Upgrade.

5.4 Perform Health Check *(Upgrade Preparation)*

This procedure is part of Software Upgrade Preparation and is used to determine the health and status of the HLR Router network and servers. This may be executed multiple times but must also be executed at least once within the timeframe of 24-36 hours prior to the start of a maintenance window.

☐ Execute Health Check procedures as specified in **Appendix B**.

5.5 ISO Administration

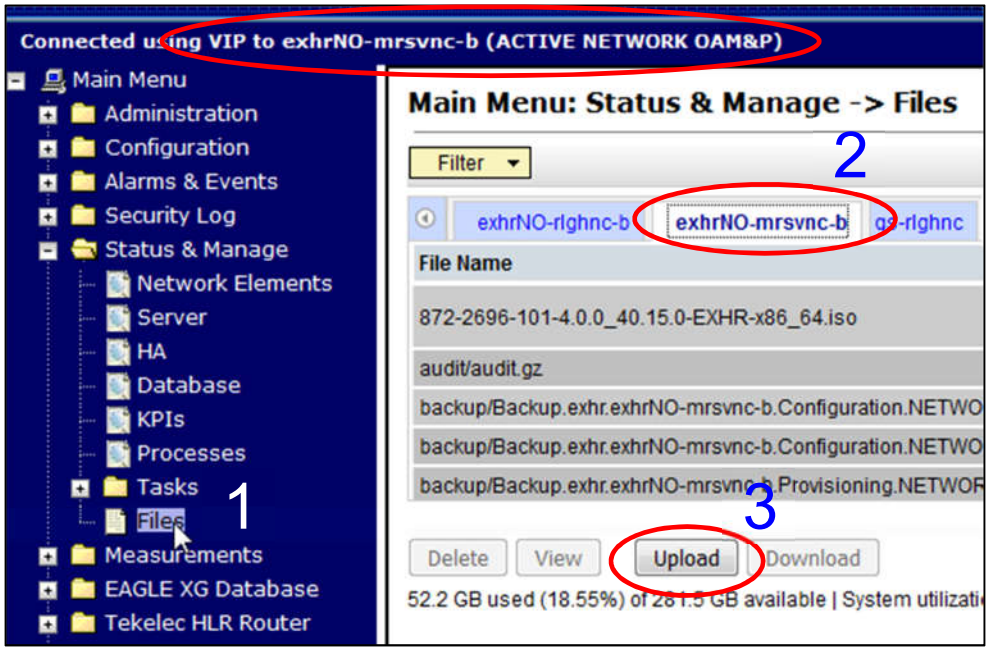
ISO transfers to the target servers may require a significant amount of time depending on the number of systems and the speed of the network. Therefore, it is highly reccommended that the ISO transfers to the target servers be completed prior to the first scheduled maintenance window.

Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.

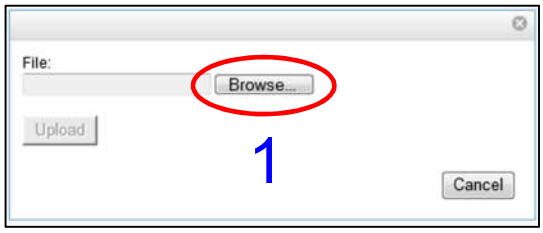
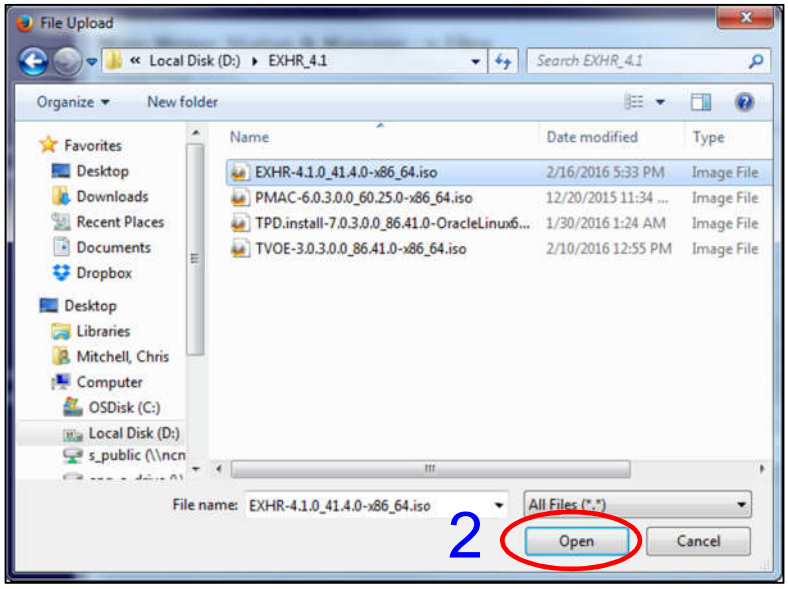
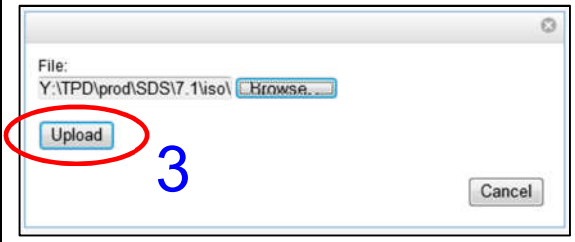
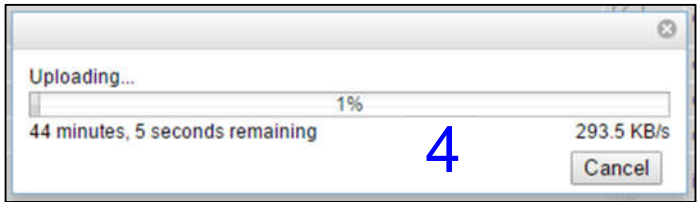
SHOULD ANY STEP IN THIS PROCEDURE FAIL, STOP AND CONTACT **"MY ORACLE SUPPORT" (MOS)** FOR ASSISTANCE BEFORE CONTINUING!

- **Appendix H:** *Adding the HLRR ISO to the PM&C SW Repository (HP only)* may be executed at anytime after **Procedure 2**: *(ISO Administration)* has been completed.

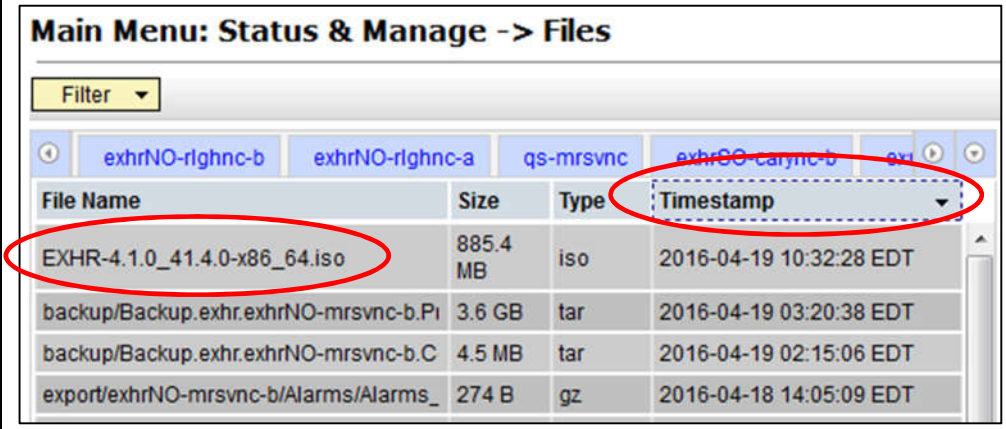
Procedure 2: ISO Administration

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM GUI**.	• Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
2. ☐	**Primary NOAM VIP (GUI):** **1)** Select… **Main Menu** **→ Status & Manage** **→ *Files*** **2)** If necessary, select the hostname of the **Active Primary NOAM** server from the tabs list. **3)** Click on the **"Upload"** button. **NOTE:** *The **Active Primary NOAM** server will be displayed in the GUI banner as being connected to the **VIP** with a state of **ACTIVE NETWORK OAM&P**.*	

Procedure 2: ISO Administration

Step	Procedure	Result
3. ☐	**Primary NOAM VIP:** **1)** Click on the **"Browse..."** dialogue button **2)** Select the Drive and directory location of the ISO file for the target release. Select the ISO file and click on the **"Open"** dialogue button. **3)** Click on the **"Upload a File"** dialogue button. **4)** Monitor the upload until the file transfer completes reaches with 100%. **NOTE:** *If transfering the ISO file to the server manually (scp), the iso must be placed in the* ***/var/TKLC/db/filemgmt/*** *directory with* ***664*** *permissions and* ***awadmin:awadm*** *ownership.*	   

Procedure 2: ISO Administration

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** In the top right side of the right panel, click the **"Timestamp"** heading **twice** so that the arrow to the right points down *(this will bring the most recent files the top of the screen)*. The ISO file uploaded in **Step 3** of this procedure should now appear at the top most position in the **"File Name"** column.	

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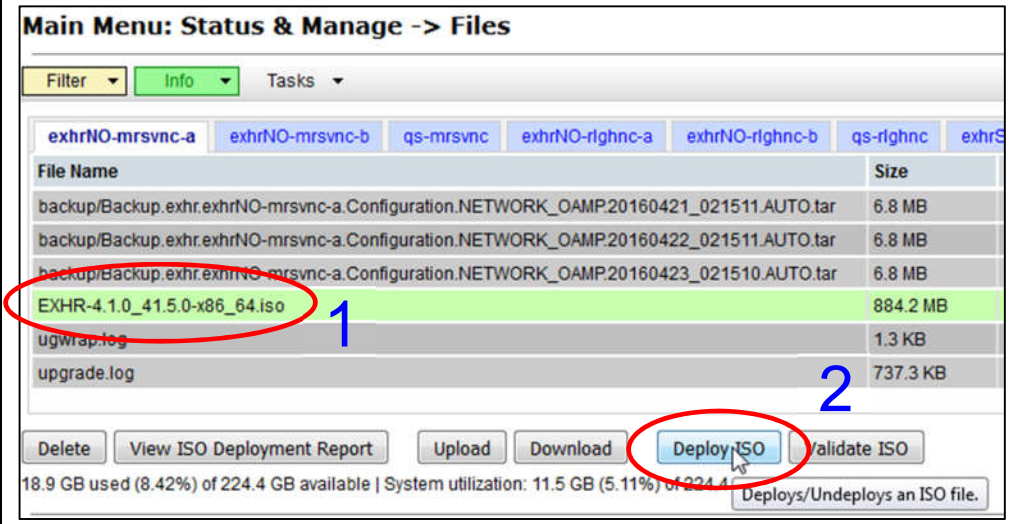
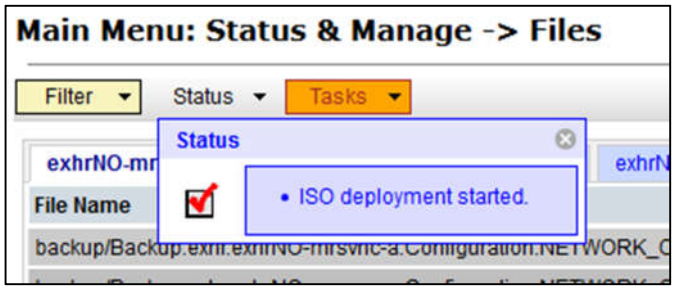
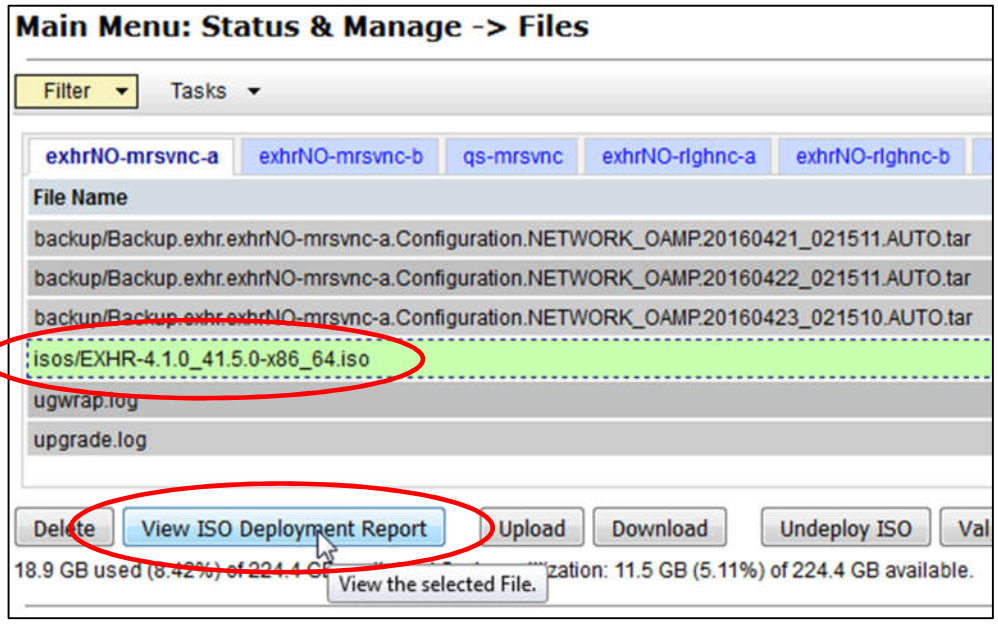
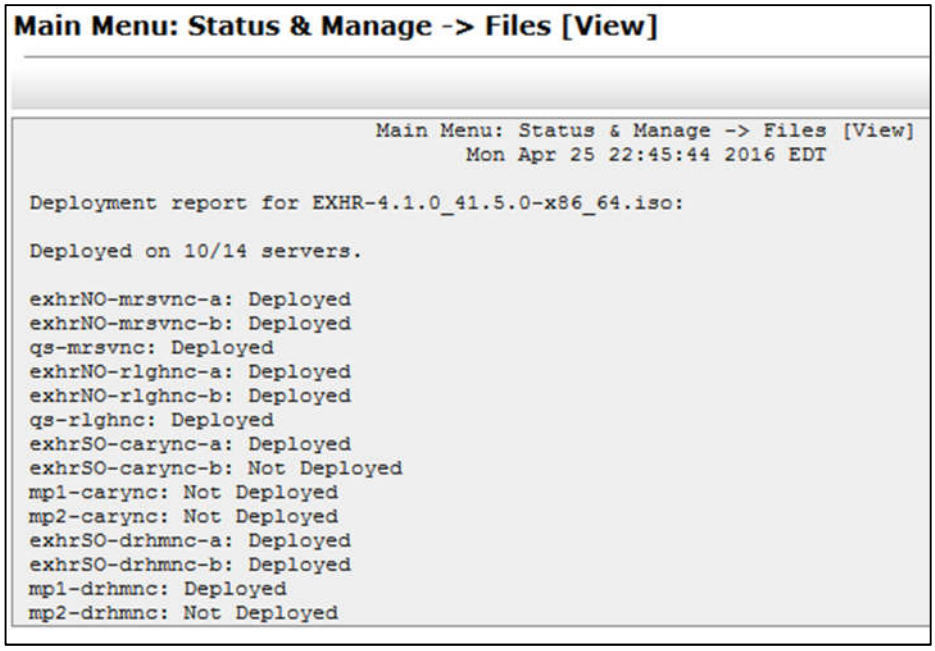
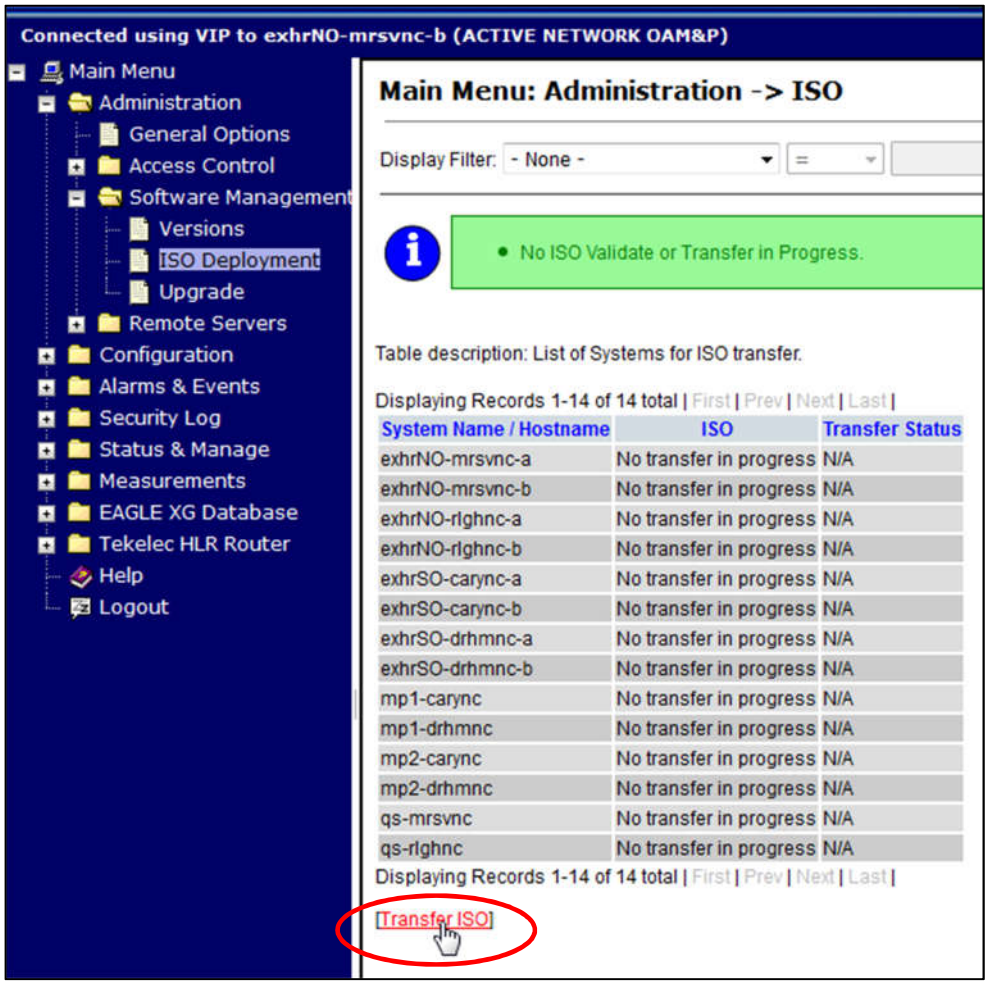
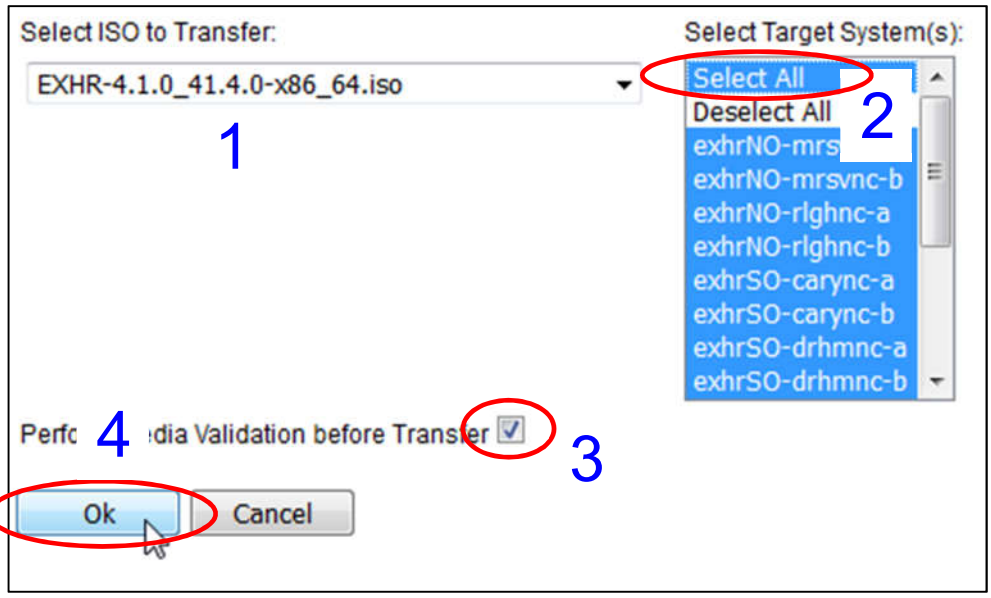
- If source release is **HLRR 4.0**, then **SKIP** to **Step 9** of this procedure.
- If source release is **HLRR 4.1**, then continue with **Step 5** of this procedure.

5. ☐	***HLRR 4.1 only*** **Primary NOAM VIP:** Deploy ISO file to all HLRR servers in the entire topology. **1)** Using the cursor, select the **ISO** file uploaded in **Step 3** of this procedure. **2)** Click **'Deploy ISO'** dialogue button. **3)** Click **'OK'** to confirm the ISO deployment.	
6. ☐	**Primary NOAM VIP:** The user should be presented with a **Status** banner message indicating that the ISO deployment has statrted.	

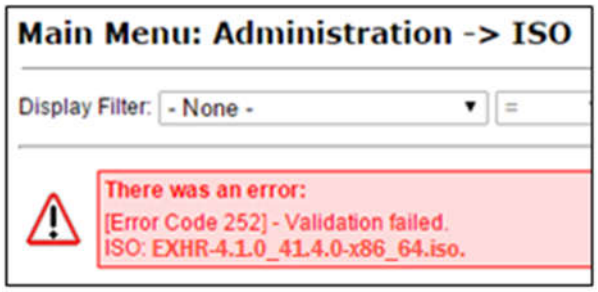
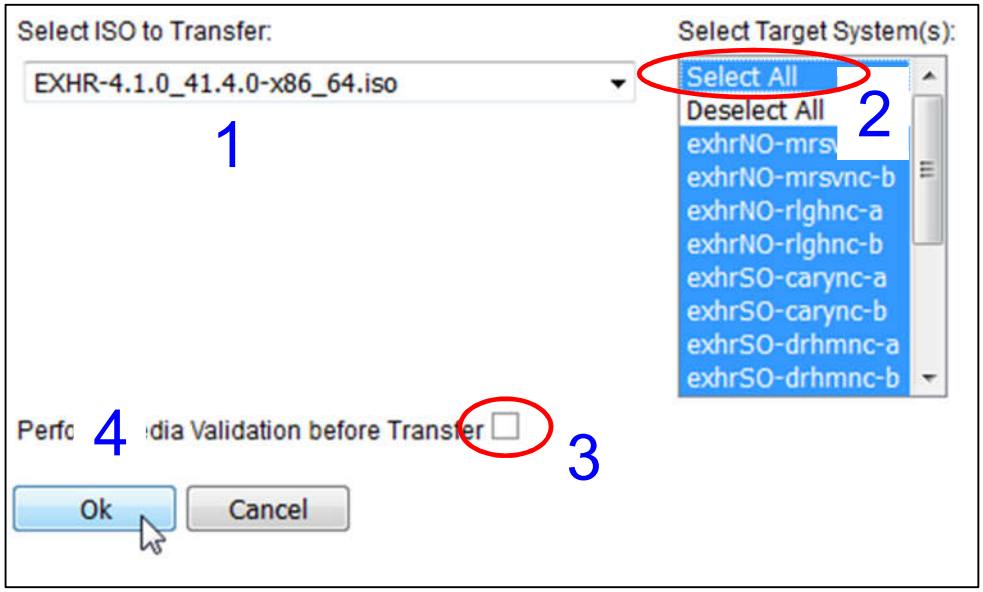
Procedure 2: ISO Administration

Step	Procedure	Result
7. ☐	**Primary NOAM VIP:** Monitor the ISO deployment status. **1)** Using the cursor, select the **ISO** file uploaded in **Step 3** of this procedure. **2)** Click the **"View ISO Deployment Report"** dialogue button.	
8. ☐	**Primary NOAM VIP:** The user is presented with the **ISO Deployment Report** indicating the **current status** of deployment to all servers in the topology. **Refresh** the report by clicking the **"Back"** dialogue button and repeating **Step 7** of this procedure until the **ISO** has been **"Deployed"** to all servers in the topology. **NOTE**: *This completes the ISO Administration procedures for source release **4.1, SKIP** the remaining steps of this procedure and exit at this time.*	
THIS PROCEDURE HAS BEEN COMPLETED ***(for Upgrade from HLRR 4.1 Source)***		
9. ☐	***Upgrade from HLRR 4.0 Source only:*** **Primary NOAM VIP:** Upload ISO file to the **Standby** HLRR server.	• Repeat **Steps 2 - 4** of this procedure to upload **ISO** file to the **"Standby" Primary NOAM** server.

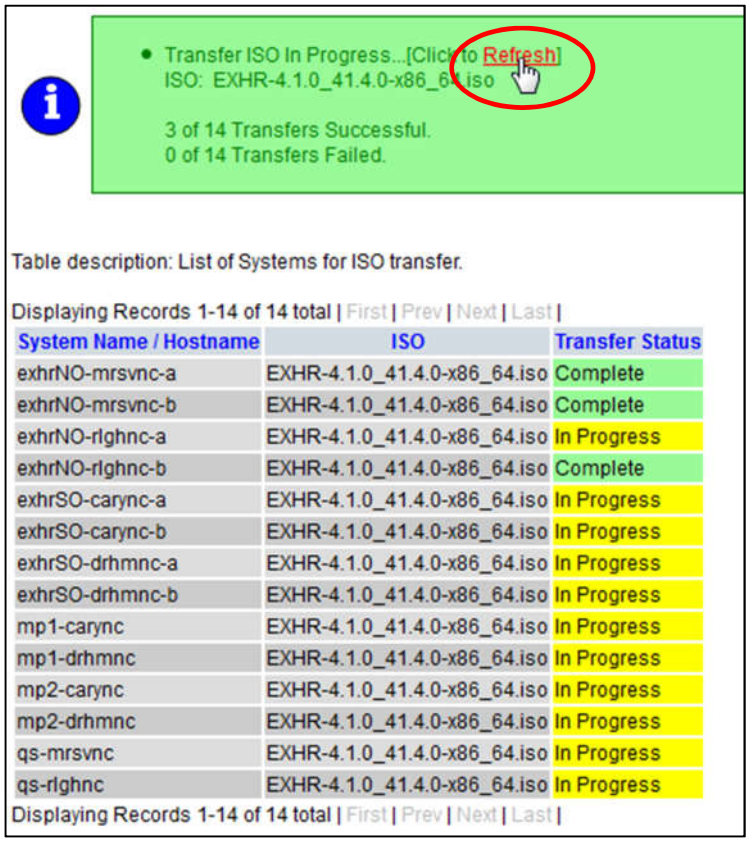
Procedure 2: ISO Administration

Step	Procedure	Result
10. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Administration** **→Software Management** ***→ ISO Deployment*** **2)** Click on the **[Transfer ISO]** link located in the bottom left quadrant of the right panel.	
11. ☐	**Primary NOAM VIP:** The user is presented with the **[Transfer ISO]** screen. **1)** Using the pull-down menu, select the **ISO** file uploaded in **Step 3** of this procedure. **2)** Click **"Select All"** or hold the **[CTRL]** key to multi-select individual servers to be upgraded. **3)** Click on the **"Perform Media Validation before transfer"** check box. **4)** Click on the **"Ok"** dialogue button.	

Procedure 2: ISO Administration

Step	Procedure	Result
12. ☐	**Primary NOAM VIP:** If **"[Error Code 252] - Validation failed."** was received, then execute **Appendix F** *(Manually Performing ISO Validation)* and then continue with **Step 13.** If no error was received, **SKIP** to **Step 14**.	
13. ☐	**Primary NOAM VIP:** The user is presented with the **[Transfer ISO]** screen. **1)** Using the pull-down menu, select the **ISO** file uploaded in **Step 3** of this procedure. **2)** Click **"Select All"** or hold the **[CTRL]** key to multi-select individual servers to be upgraded. **3) DO NOT** click on the **"Perform Media Validation before transfer"** check box. **4)** Click on the **"Ok"** dialogue button.	

Procedure 2: ISO Administration

Step	Procedure	Result
14. ☐	**Primary NOAM VIP:** **1)** The user ispresented with the **ISO** Administration screen. **2)** The progress of the individual file transfers may be monitored by periodically clicking on the **[Click to Refresh]** link in the information banner message. **3)** Continue to monitor the file transfer progress until a **"Transfer Status"** of **"Complete"** is received for all selected servers.	 Table description: List of Systems for ISO transfer. Displaying Records 1-14 of 14 total | First | Prev | Next | Last | System Name / Hostname / ISO / Transfer Status exhrNO-mrsvnc-a / EXHR-4.1.0_41.4.0-x86_64.iso / Complete exhrNO-mrsvnc-b / EXHR-4.1.0_41.4.0-x86_64.iso / Complete exhrNO-rlghnc-a / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress exhrNO-rlghnc-b / EXHR-4.1.0_41.4.0-x86_64.iso / Complete exhrSO-carync-a / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress exhrSO-carync-b / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress exhrSO-drhmnc-a / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress exhrSO-drhmnc-b / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress mp1-carync / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress mp1-drhmnc / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress mp2-carync / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress mp2-drhmnc / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress qs-mrsvnc / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress qs-rlghnc / EXHR-4.1.0_41.4.0-x86_64.iso / In Progress Displaying Records 1-14 of 14 total | First | Prev | Next | Last |
THIS PROCEDURE HAS BEEN COMPLETED ***(for Upgrade from HLRR 4.0 Source)***		

5.6 Perform Health Check *(Post ISO Administration)*

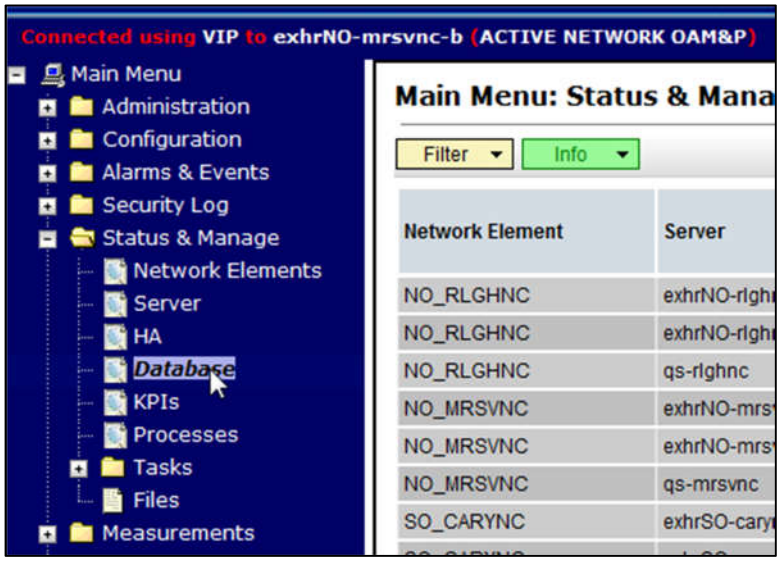
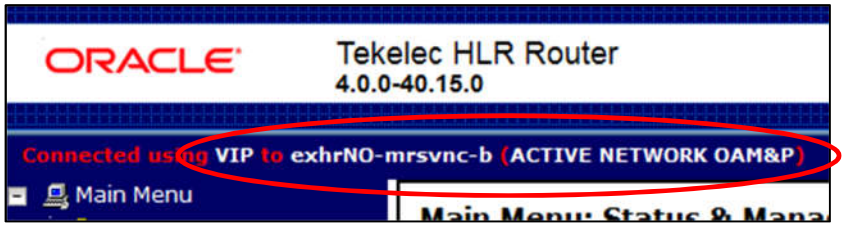
This procedure is part of Software Upgrade Preparation and is used to determine the health and status of the entire HLR Router network and servers. This may be executed multiple times but must also be executed at least once within the time frame of 24-36 hours prior to the start of a maintenance window.

☐ Execute HLR Router Health Check procedures as specified in **Appendix B.**

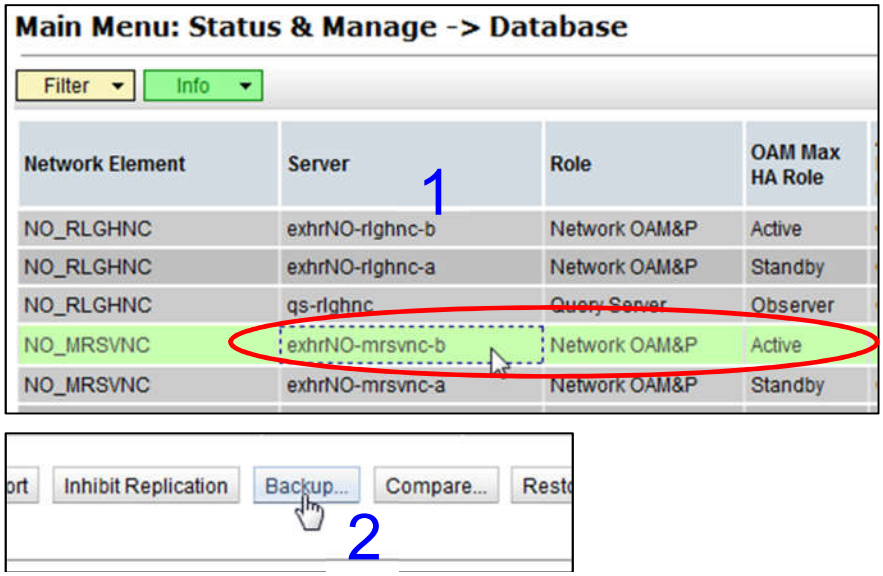
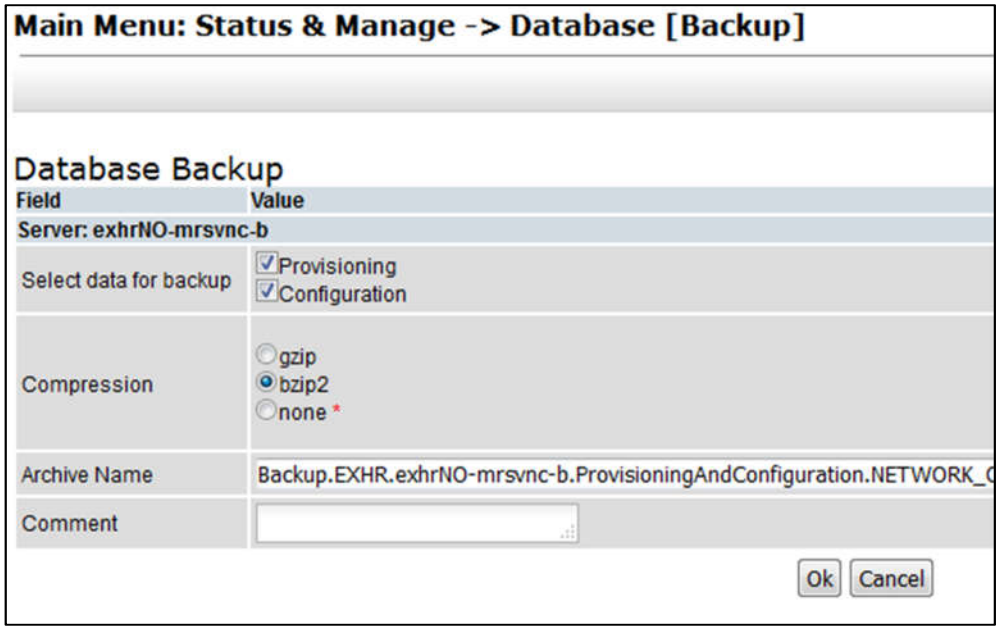
5.7 Full Database Backup (PROV & COMCOL ENV for All Servers)

This procedure is part of Software Upgrade Preparation and is used to conduct a full backup of the COMCOL run environment on every server, to be used in the event of a backout/rollback of the new software release.

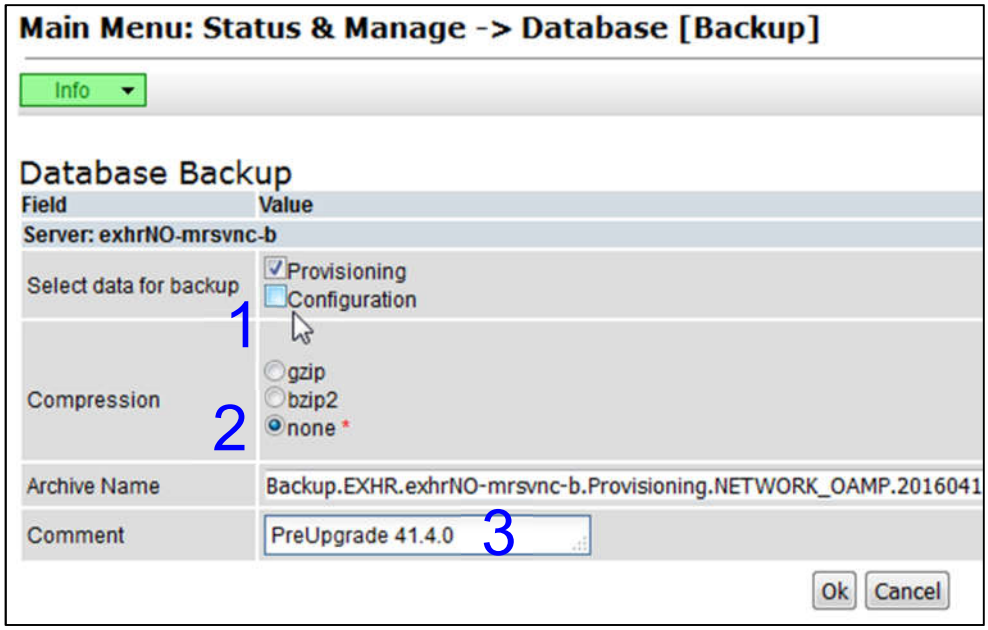
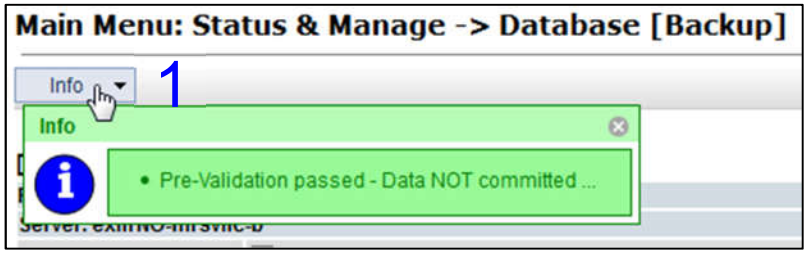
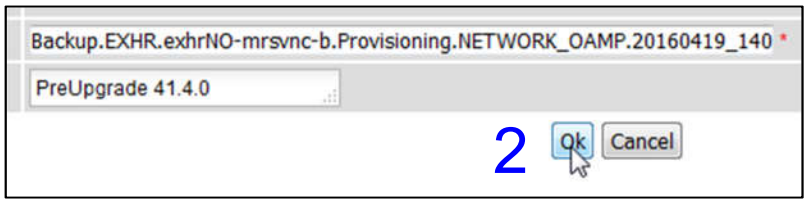
Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM GUI**.	• Use the **VIP** address to access the **Primary HLRR NOAM GUI** as specified in **Appendix A.**
2. ☐	**Primary NOAM VIP:** Select… **Main Menu** **→ Status & Manage** **→ *Database*** …as shown on the right.	
3. ☐	**Primary NOAM VIP:** The name of the **Primary Active NOAM** HLRR server may be easily verifed from the GUI banner.	

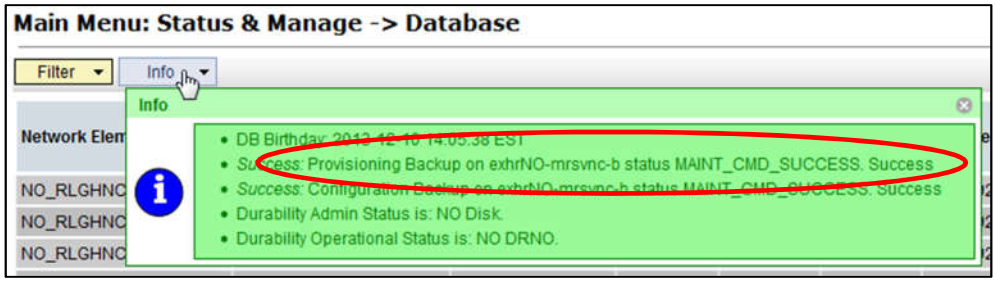
Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** **1)** Using the cursor, select the Primary **Active NOAM** HLRR server on the **[Status & Manage → Database]** screen. **2)** Then click the **"Backup…"** dialogue button in the bottom of the right panel.	
5. ☐	**Primary NOAM VIP:** The user will be present with the backup form.	

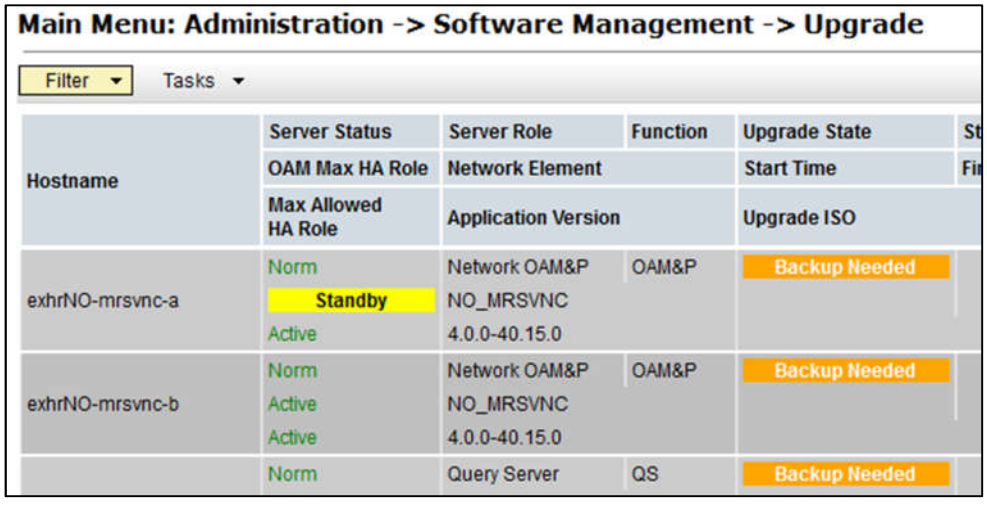
Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** **1) Uncheck** the "**Configuration**" checkbox so that only **"Provisioning"** data is backed up. **2)** Select **"none"** for the Compression setting. **3)** Enter a comment *(required)* and then left click the cursor outside the comment field.	
7. ☐	**Primary NOAM VIP:** **1)** Click the "**Info**" tab to verify that the changes have passed **Pre-Validation**. **2)** Click **"Ok"** dialogue button in the bottom of the right panel.	 

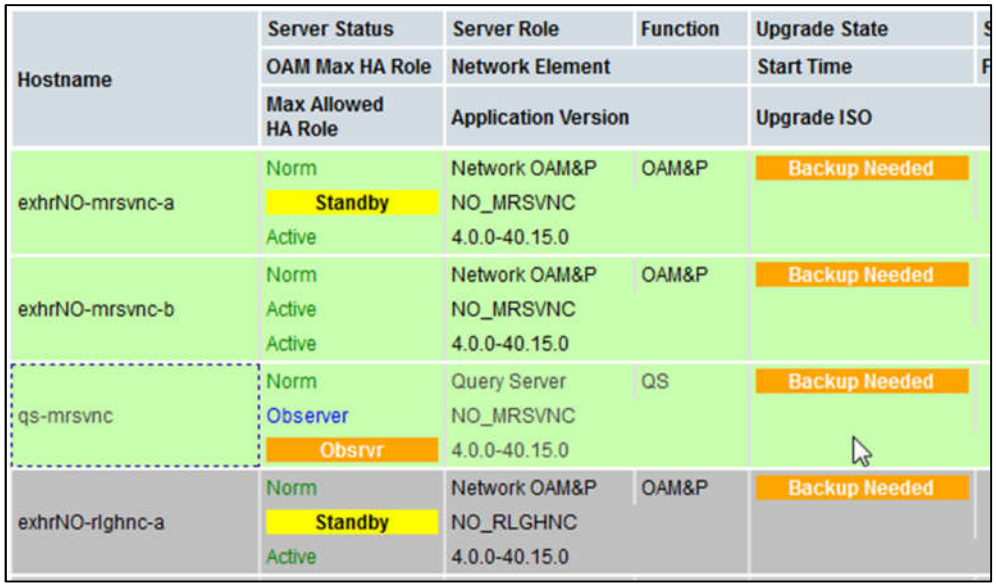
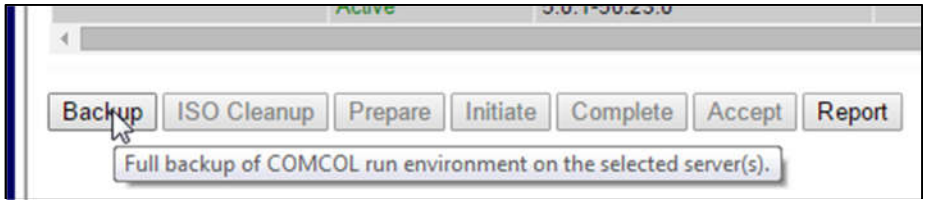
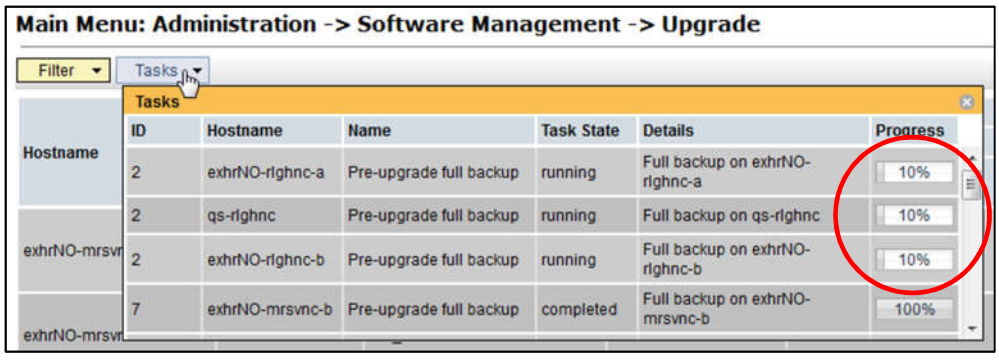
Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

Step	Procedure	Result
8. ☐	**Primary NOAM VIP:** **Wait for the screen to refresh** (≈ 1-2 minutes) then click the **"Info"** tab to verify that the **Provisioning Backup** shows a status of **MAINT_CMD_SUCCESS**. If a status of **MAINT_IN_PROGRESS** is received, then periodically **refresh** the **Info** message by reselecting… **Main Menu** **→ Status & Manage** **→ *Database*** …then click the **"Info"** tab again. **NOTE:** *This step completes the backup of the HLRR Provisioning Database.*	 **NOTE:** *The length of time required to complete the backup of the HLRR Provisioning Database will vary based on the size of the customer database. The user should allow up to 60 minutes for this step to complete.*

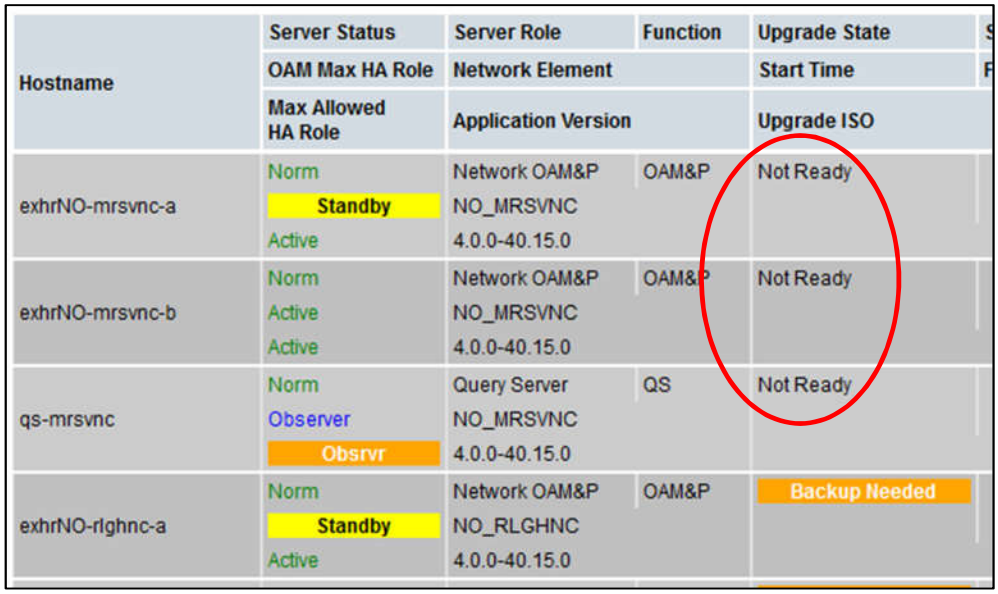
- If **source** release is **HLRR 4.1**, then **SKIP** to **Step 15** of this procedure.
- If **source** release is **HLRR 4.0**, then continue with **Step 9** of this procedure.

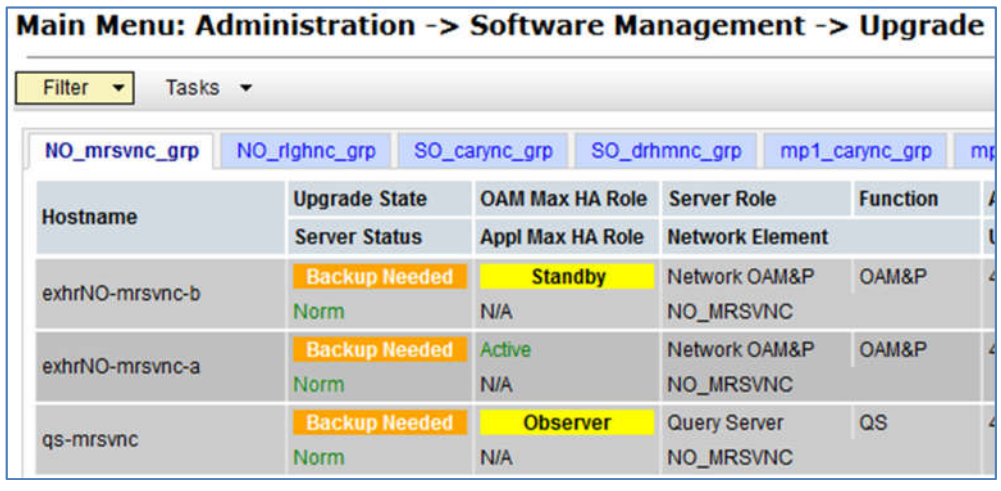
Step	Procedure	Result
9. ☐	**HLRR 4.0 only** **Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Adminustration** **→ Software Management** **→ Upgrade**	

Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

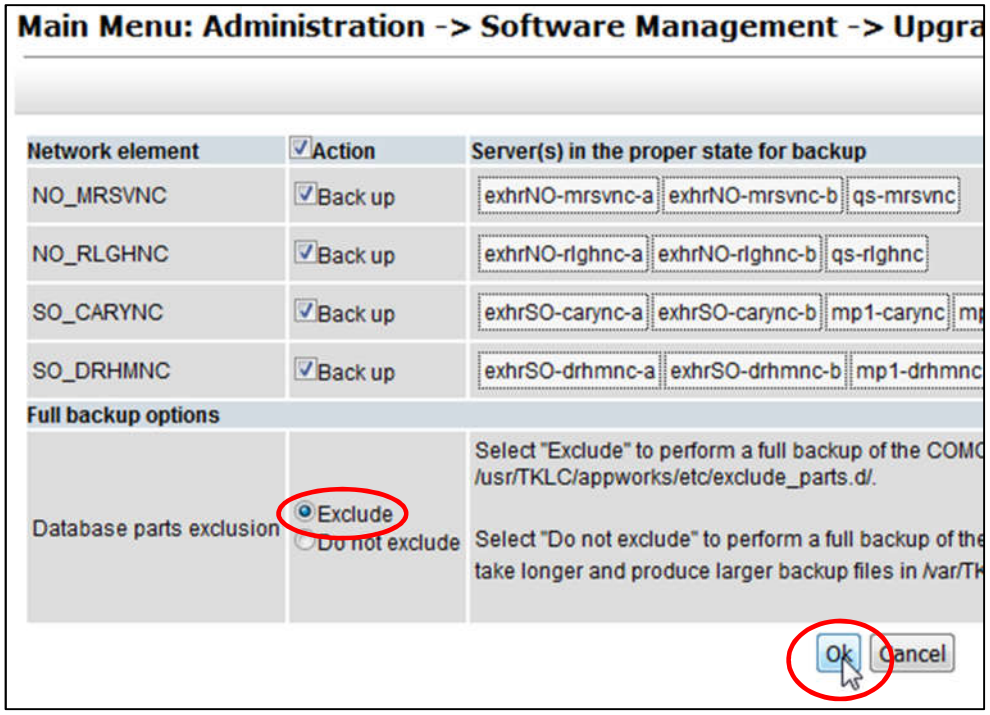
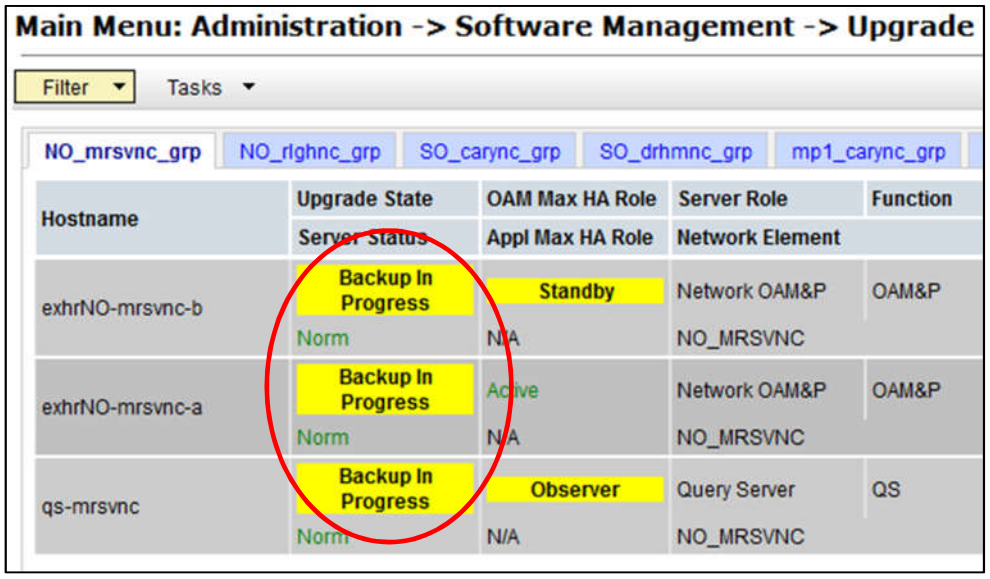
Step	Procedure	Result
10. ☐	**Primary NOAM VIP:** **1)** While holding the **[CTRL]** key, multi-select the rows containing the **hostnames** of the servers in the **Network Element (NE)** to be upgraded. **2)** Verify that the **Upgrade State** shows **"Backup Needed"** for each server.	
11. ☐	**Primary NOAM VIP:** Click the **"Backup"** dialogue button located across the bottom left of the right panel.	
12. ☐	**Primary NOAM VIP:** **Wait for the screen to refresh** once again then click the **"Tasks"** tab to view the individual backup task progress.	

Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

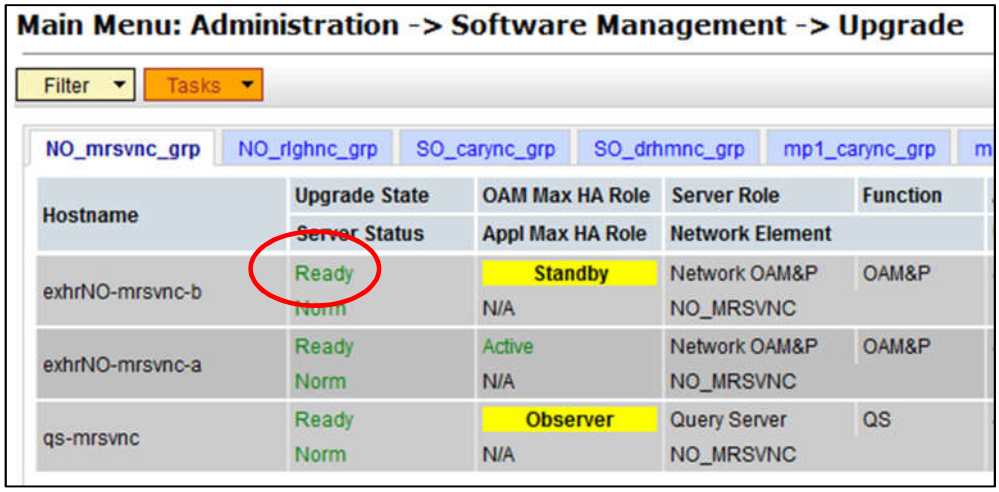
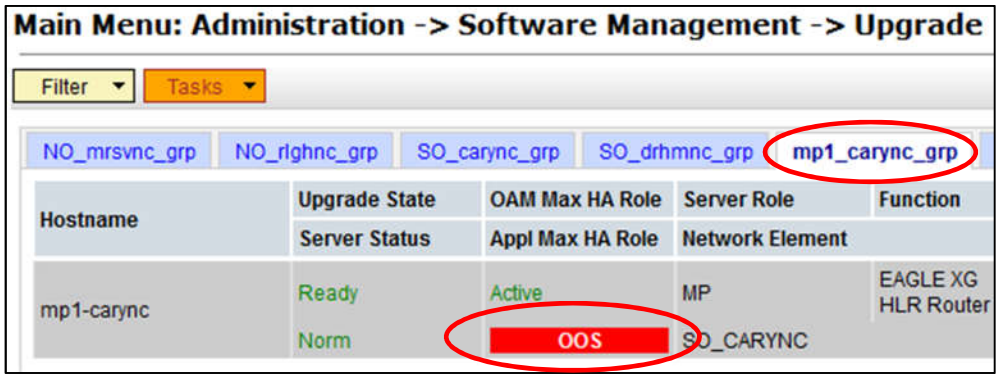
Step	Procedure	Result
13. ☐	**Primary NOAM VIP:** *The **"Upgrade"** screen and the **"Tasks"** tab Progress bar will auto-refresh at this point.* Monitor all servers backed up in **Step 10** of this procedure until the **"Upgrade State"** changes from **"Backup Needed"** to **"Not Ready".** **NOTE:** *The COMCOL enviorment backups may take several minutes to complete. Please allow at least 30 minutes.*	
14. ☐	**Primary NOAM VIP:** Execute COMCOL enviorment backups for the next NE	• Repeat **Steps 10 - 13** of this procedure *(one Network Element at a time)*, until all servers in the topology display an **"Upgrade State"** of **"Not Ready".** **NOTE**: *This completes the COMCOL environment Backup procedures for source release **4.0, SKIP** the remaining steps of this procedure and exit at this time.*
THIS PROCEDURE HAS BEEN COMPLETED ***(Upgrade from HLRR 4.0 Source)***		

Upgrade from HLRR 4.1 Source only:		
15. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Adminustration** **→ Software Management** **→ *Upgrade*** The server **"Upgrade State"** will show **"Backup Needed"** at this point. **2)** In the bottom of the right panel, click the **"Backup All"** button.	

Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

Step	Procedure	Result
16. ☐	**Primary NOAM VIP:** The user is presented with the **Upgrade [Backup All]** screen. **1)** Verify that the **"Exclude"** radial button is selected. **2)** Click **"Ok"** button to begin the backup(s). **NOTE:** *All servers in the topology which are in a state from which upgrade can be initiated will be visible on this screen (i.e. servers in "Forced Standby" or "OOS" will not present).*	
17. ☐	**Primary NOAM VIP:** The user is returned to the **Active Primary HLRR** server **tab** on the **Administration → Software → Upgrade** screen where the server **"Upgrade State"** should now show **"Backup in Progress"** for all servers on that tab.	

Procedure 3: Full Database Backup (PROV & COMCOL ENV for All Servers)

Step	Procedure	Result
18. ☐	**Primary NOAM VIP:** The screen will auto-refresh at this point. Monitor the Backups until the server **"Upgrade State"** shows **"Ready"** for all servers on that tab. **NOTE:** *It can take up to 20 minutes for for COMCOL backup to complete.*	
19. ☐	**Primary NOAM VIP:** Click on the each **tab** and monitor the Backups until the server **"Upgrade State"** shows **"Ready"** for all servers on all tabs. **!! IMPORTANT !!** Starting with **HLRR 4.1**, the **Appl Max HA Role** is now displayed in the **Administration → Software → Upgrade** screen. This state is expected to be **OOS** for **HLRR MP** servers.	
20. ☐	**Primary NOAM VIP:** Monitor the remaining tabs under the **Administration → Software → Upgrade** screen until all servers on each tab display a server **"Upgrade State"** value of **"Ready"**.	• Repeat **Step 19** of this procedure until all servers in the topology display a server **"Upgrade State"** value of **"Ready"**.
THIS PROCEDURE HAS BEEN COMPLETED ***(Upgrade from HLRR 4.1 Source)***		

6. PRIMARY / DR HLRR NOAM UPGRADE EXECUTION

Call **My Oracle Support (MOS)** and inform them of your plans to upgrade this system prior to executing this upgrade.

Refer to **Appendix J:** Accessing My Oracle Support (MOS) for information on contacting **MOS**.

Before upgrade, users must perform the system Health Check (**Appendix B).** This check ensures that the system to be upgraded is in an upgrade-ready state. Performing the system health check determines which alarms are present in the system and if upgrade can proceed with alarms.

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

If there are servers in the system, which are not in Normal state, these servers should be brought to the Normal or the Application Disabled state before the upgrade process is started. The sequence of upgrade is such that servers providing support services to other servers will be upgraded first.

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

Please read the following notes on this procedure:

If a procedural STEP fails to execute successfully or fails to receive the desired output, **STOP** and contact **MOS** for assistance before attempting to continue.

Procedure completion times shown here are estimates. Times may vary due to differences in database size, user experience, and user preparation.

Where possible, command response outputs are shown as accurately as possible. EXCEPTIONS are as follows:

- Session banner information such as time and date.
- System-specific configuration information such as hardware locations, IP addresses and hostnames.
- ANY information marked with "XXXX" or "YYYY." Where appropriate, instructions are provided to determine what output should be expected in place of "XXXX or YYYY"
- Aesthetic differences unrelated to functionality such as browser attributes: window size, colors, toolbars and button layouts.

After completing each step and at each point where data is recorded from the screen, the technician performing the upgrade must mark the provided Checkbox.

For procedures which are executed multiple times, a mark can be made below the Checkbox (in the same column) for each additional iteration that the step is executed.

Retention of Captured data is required as a future support reference if this procedure is executed by someone other than Oracle's Tekelec Customer Care Center.

NOTE: *In order to minimize possible impacts due to database schema changes, Primary and DR HLRR NOAM Network Elements must be upgraded within the same maintenance window.*

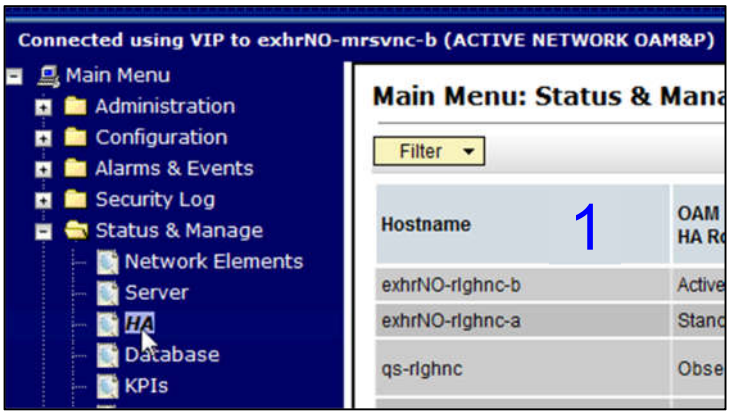
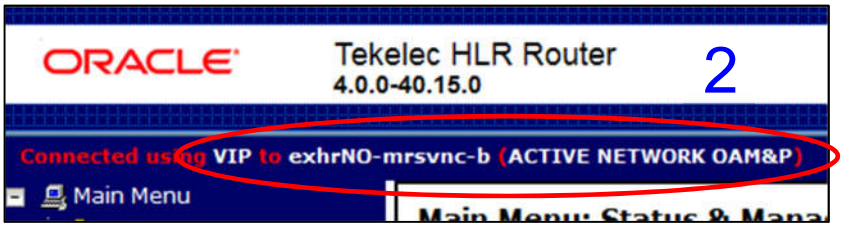
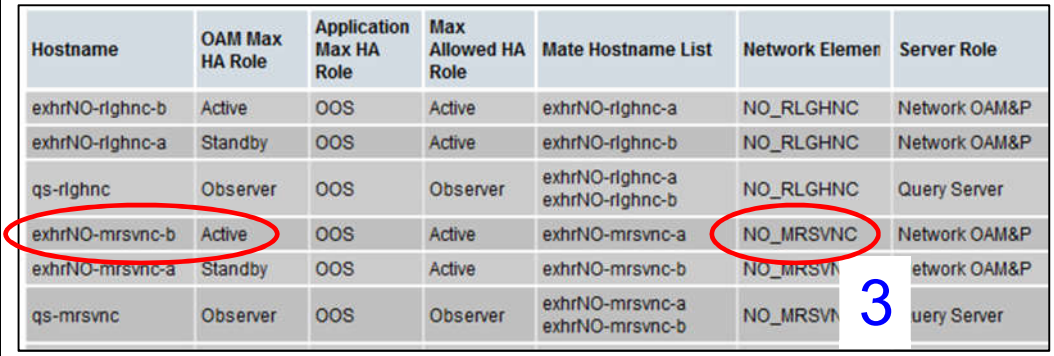
6.1 Perform Health Check *(Primary/DR NOAM Pre Upgrade)*

This procedure is part of Software Upgrade Preparation and is used to determine the health and status of the entire HLR Router network and servers. This may be executed multiple times but must also be executed at least once within the time frame of 24-36 hours prior to the start of a maintenance window.

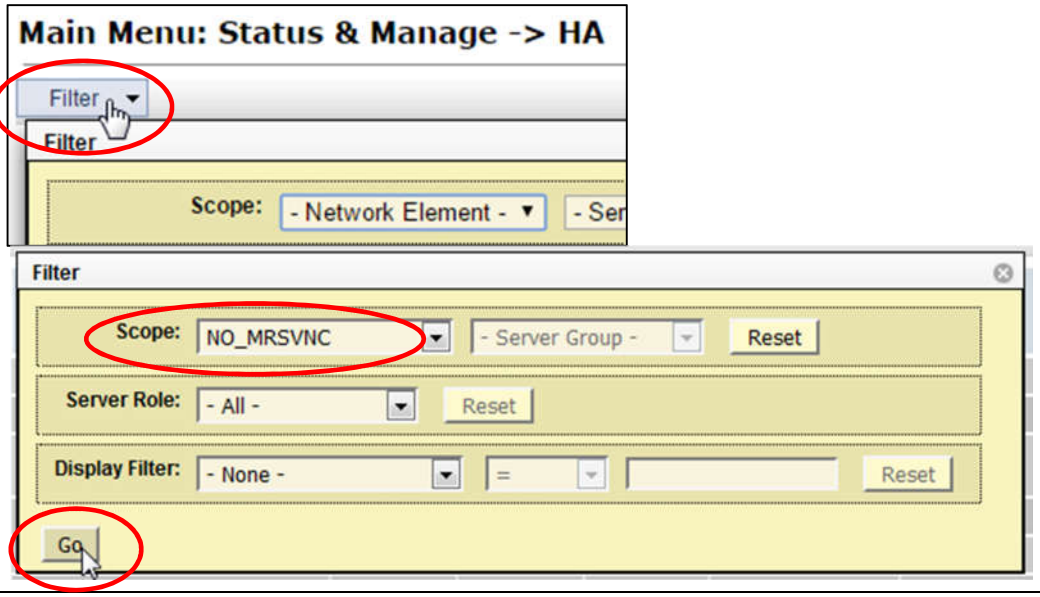
☐ Execute HLR Router Health Check procedures as specified in **Appendix B.**

6.2 Upgrade Primary NOAM NE

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** → **Status & Manage** → ***Database*** **2)** The name of the **Primary Active NOAM** server may be easily verifed from the GUI banner. **3)** Using the **Primary Active NOAM** server as a reference point, we can now identify the name of the **Primary NOAM NE.**	  
3. ☐	Record the name of the **Primary HLRR NOAM NE** in the space provided.	Using the information provided in **Section 3.1.2** *(Logins, Passwords and Site Information)* record the name of the **Primary HLRR NE site** in the space provided below: **Primary HLRR NOAM NE: _____**

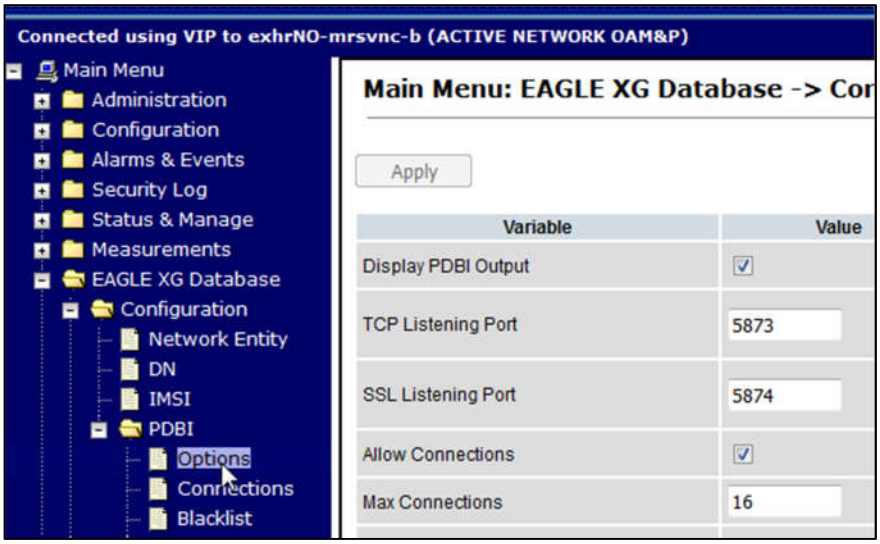
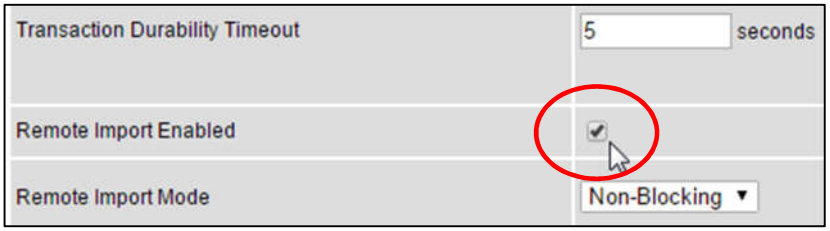
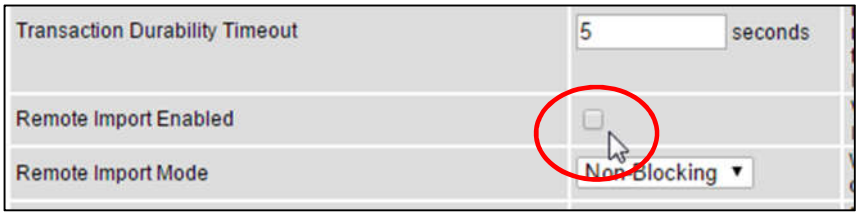
Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** **1)** Click the **"Filter"** tab in the top left of the right panel. **2)** Under **"Scope"** select the **Network Element** name for the **Primary HLRR NOAM NE.** **2)** Click on the **"Go"** dialogue button.	
5. ☐	**Primary NOAM VIP:** The user should be presented with the list of servers associated with the **Primary HLRR NOAM NE** Identify each "**Hostname"**, its **"Server Role"** and **"OAM HA Role"**.	**Main Menu: Status & Manage -> HA (Filtered)** Filter

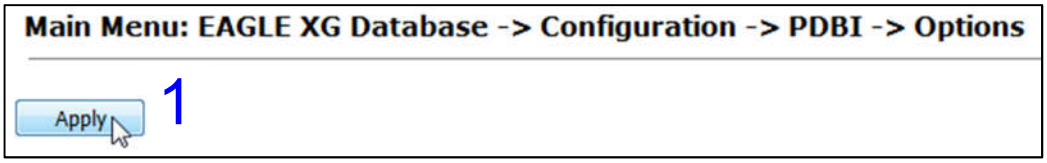
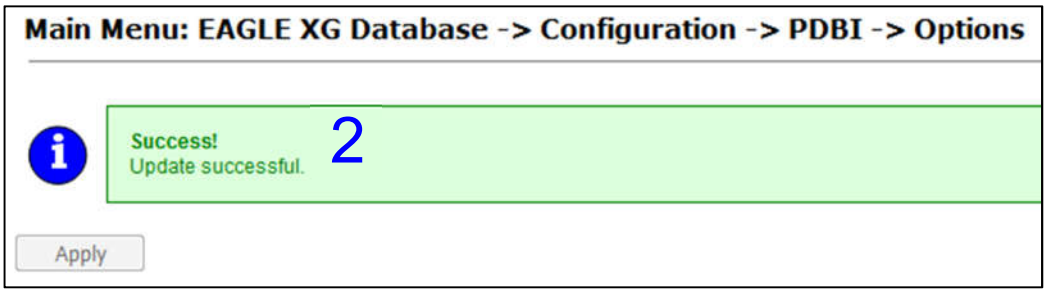
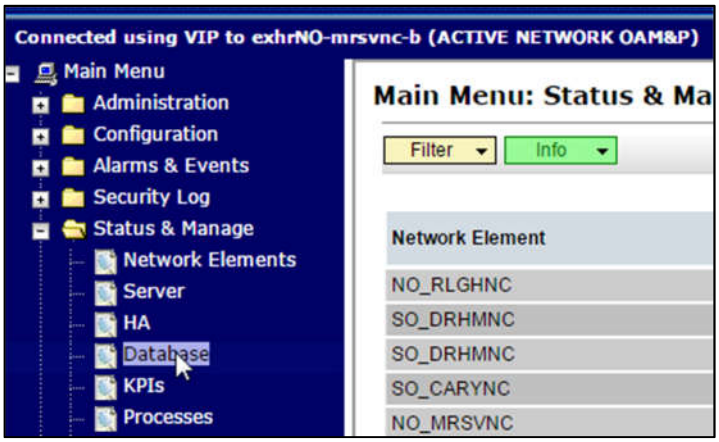
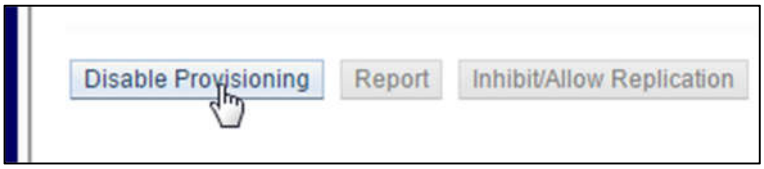
Hostname	OAM Max HA Role	Application Max HA Role	Max Allowed HA Role	Mate Hostname List	Network Element	Server Role
exhrNO-mrsvnc-b	Active	OOS	Active	exhrNO-mrsvnc-a	NO_MRSVNC	Network OAM&P
exhrNO-mrsvnc-a	Standby	OOS	Active	exhrNO-mrsvnc-b	NO_MRSVNC	Network OAM&P
qs-mrsvnc	Observer	OOS	Observer	exhrNO-mrsvnc-a exhrNO-mrsvnc-b	NO_MRSVNC	Query Server

6. ☐	**Primary NOAM VIP:** Record the names of **Primary HLRR NOAM NE** servers in the space provided to the right.	☐ **Primary NOAM "Active":** _____ ☐ **Primary NOAM "Standby":** _____ ☐ **Primary Query Server** *(if equipped)*: _____

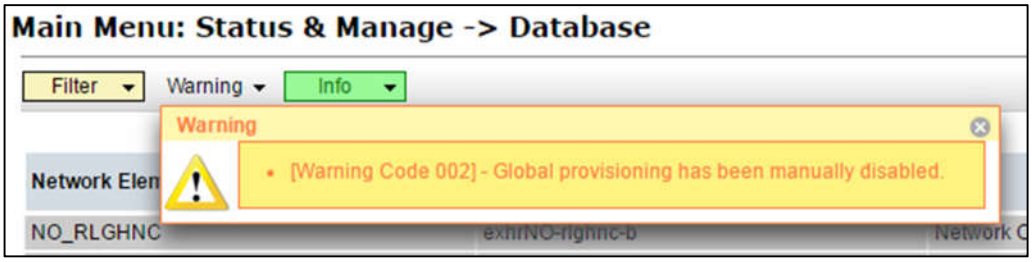
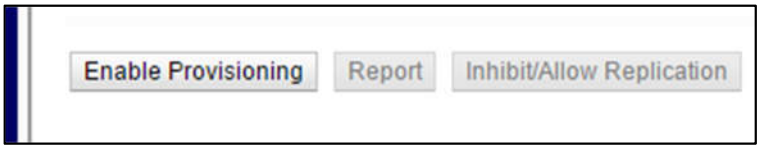
Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
7. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ EAGLE XG Database** **→ Configuration** **→ PDBI** **→ *Options*** …as shown on the right.	
8. ☐	**Primary NOAM VIP:** Locate the **"Remote Import Enabled"** checkbox and record the pre-upgrade state.	 Remote Import Enabled *(pre-upgrade state)*: ☐ CHECKED ☐ NOT CHECKED
9. ☐	**Primary NOAM VIP:** If the **"Remote Import Enabled"** checkbox was checked in the previous step, **REMOVE** the check mark.	

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
10. ☐	**Primary NOAM VIP:** If the **Check mark** was **REMOVED** from the **"Remote Import Enabled"** checkbox in the previous step, then execute the following: **1)** Click the **"Apply"** dialogue box in the top left of the right panel. **2)** Verify that a **"Success!"** response is received in the banner.	 
11. ☐	**Primary NOAM VIP:** Select… **Main Menu** → **Status & Manage** → ***Database*** …as shown on the right.	
12. ☐	**Primary NOAM VIP:** **1)** Click the **"Disable Provisioning"** dialogue button at the bottom of the right panel. **2)** Click the **"OK"** button on the confirmation pop-up box.	 

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
13. ☐	**Primary NOAM VIP:** **1)** Verify that a **Warning** message indicating that **"Global provisioning has been manually disabled"** will appear in the banner. **2)** Verify that the text on the dialogue button at the bottom of the right panel changes to state **"Enable Provisioning".** **NOTE:** ***Event ID 10008*** *(Provisioning Manually Disabled) will appear at this time and can be safely ignored.*	 

- If source release is **HLRR 4.1**, then **SKIP** to **Step 37** of this procedure.
- If source release is **HLRR 4.0**, then continue with **Step 14** of this procedure.

14. ☐	***HLRR 4.0 only*** **Primary NOAM VIP:** Upgrade the **"Standby" Primary NOAM s**erver.	• Upgrade the **Primary NOAM "Standby"**server (as identified and recorded in **Step 6** of this procedure) using **Appendix C** *(Upgrade Server on HLRR 4.0).* • In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **Primary NOAM "Active"** server.

15. ☐	**Primary NOAM VIP (CLI):**
	Using the **VIP** address, login to the **"Active" Primary HLRR NOAM** with the **admusr** account.
		`CentOS release 6.7`
		`Kernel 2.6.18-274.4.1.e15prerel5.0.0_72.32.0 on an x86_64`
		
		`exhrNO-mrsvnc-b login:` **`admusr`**
		`Password:` ***`<admusr_password>`***

16. ☐	**Primary NOAM VIP:**
	The user will be presented with output similar to that shown to the right.
		`*** TRUNCATED OUTPUT ***`
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds`
		`PROMPATH=/opt/comcol/prod`
		`RUNID=00`
		`[admusr@exhrNO-mrsvnc-b ~]$`

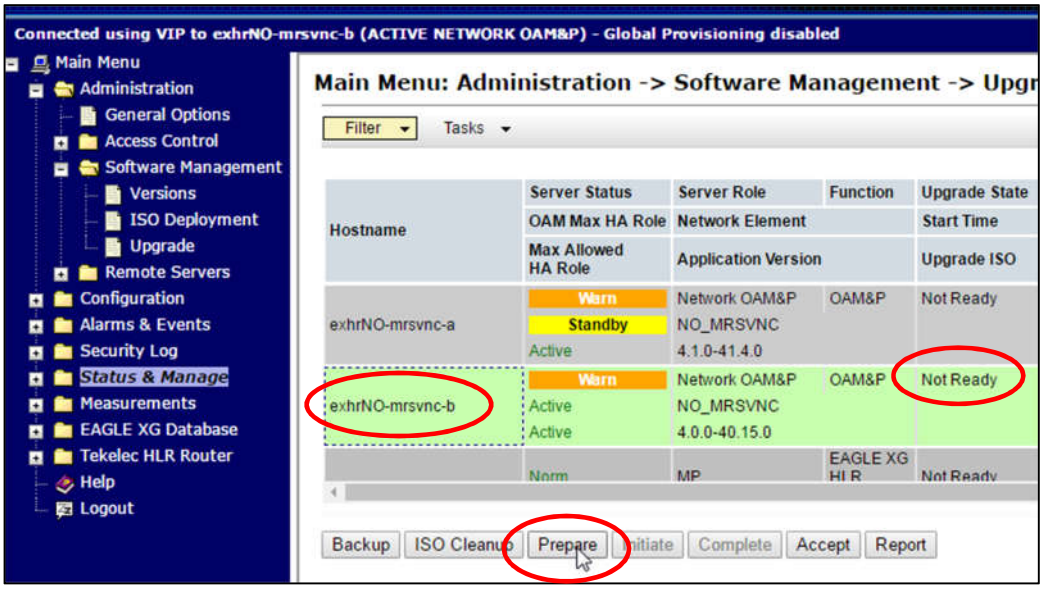
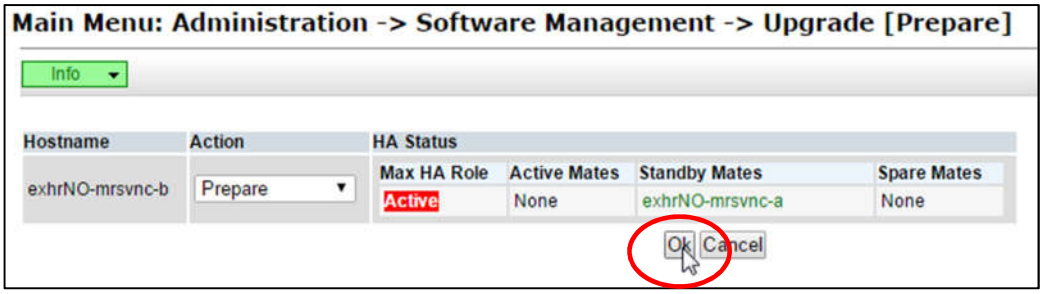
Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result

17. ☐	**Primary NOAM VIP:**
	Verify that the **DbReplication** status is **"Active"** to the **Standby Primary NOAM** which was upgraded in **Step 14** of this procedure.
		`[admusr@exhrNO-mrsvnc-b ~]$ sudo irepstat -w`
		`-- Policy 0 ActStb [DbReplication]`
		`AA To exhrNO-rlghnc-b Active 0 0.00 1%R 3%S 0.04%cpu 22B/s`
		`AA To exhrNO-mrsvnc-a Active 0 0.00 1%R 0.05%cpu 21B/s`
		`AA To qs-mrsvnc Active 0 0.00 1%R 3%S 0.05%cpu 22B/s`
		`AB To exhrSO-carync-a Active 0 0.00 1%R 3%S 0.05%cpu 22B/s`
		`AB To exhrSO-drhmnc-b Active 0 0.00 1%R 3%S 0.04%cpu 22B/s`
		
		`irepstat ( 7 lines) (h)elp`
		
		`[admusr@exhrNO-mrsvnc-b ~]$`

18. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT*** *proceed to the next step until a DbReplication status of* ***"Active"*** *is returned for the* ***Standby Primary NOAM*** *server.*	• If a **DbReplication** status of **"Audit"** was received for the **Standby Primary NOAM** server in the previous step, then **REPEAT Step 17** of this procedure until a status of **"Active"** is returned.
19. ☐	**Primary NOAM VIP:** Exit the **CLI** for the **"Active" Primary NOAM** server.	`[admusr@exhrNO-mrsvnc-b filemgmt]$ exit` `Logout`
20. ☐	Using the VIP address, access **the Primary NOAM GUI**.	• Using the VIP address, access the **Primary NOAM GUI** as described in **Appendix A.**

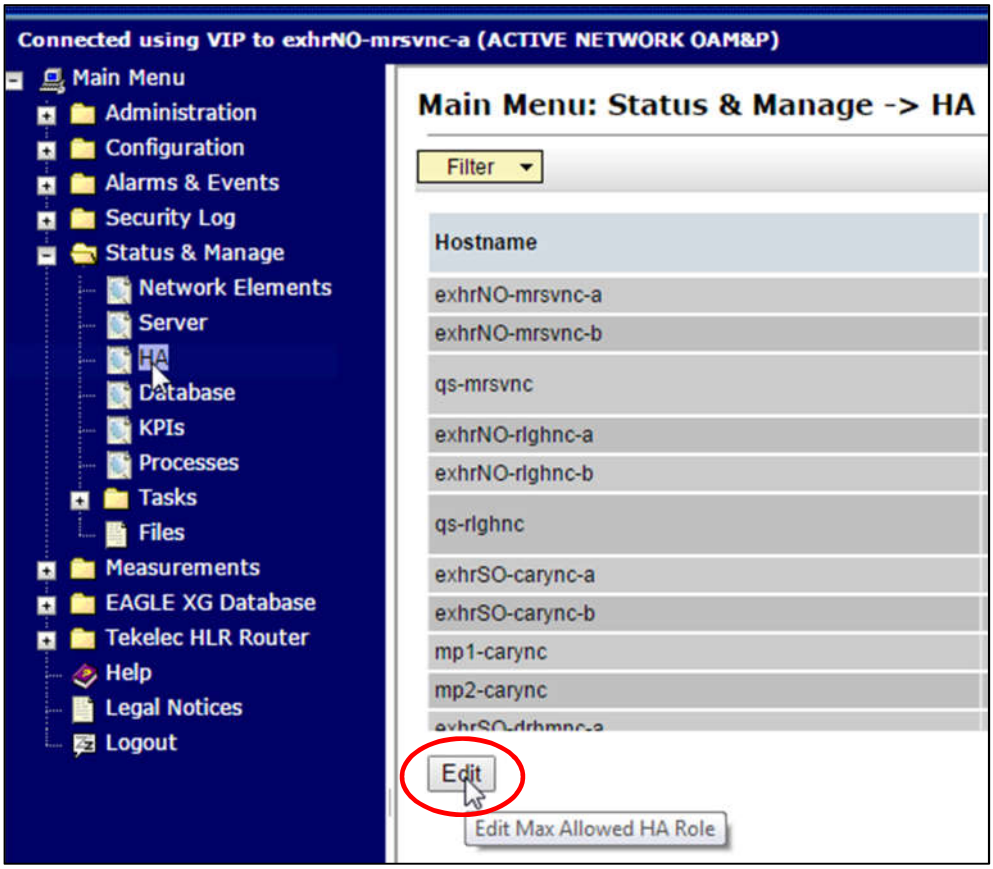
Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
21. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** → **Administration** → **Software Management** → **Upgrade** **2)** Using the vertical scroll bar in the right panel, scroll to the row containing the **hostname** of the **"Active" Primary HLRR NOAM** (as identified and recorded in **Step 6** of this procedure). **3)** Verify that the **Upgrade State** shows **"Not Ready"**. **4)** Click the **"Prepare"** dialogue button located in the bottom left of the right panel.	
22. ☐	**Primary NOAM VIP:** The user should be presented with the **Upgrade [Make Ready]** screen. Click on **"Ok"** dialogue button.	
23. ☐	**Primary NOAM VIP:** As the **"Active" Primary HLRR NOAM** server is placed in the **"Prepare"** Upgrade state, an **HA Switchover** will occur.	• The user will be **disconnected** from the **GUI** session as the **"Active" Primary NOAM Server** goes through **HA Switchover** and becomes the **"Standby"** server.

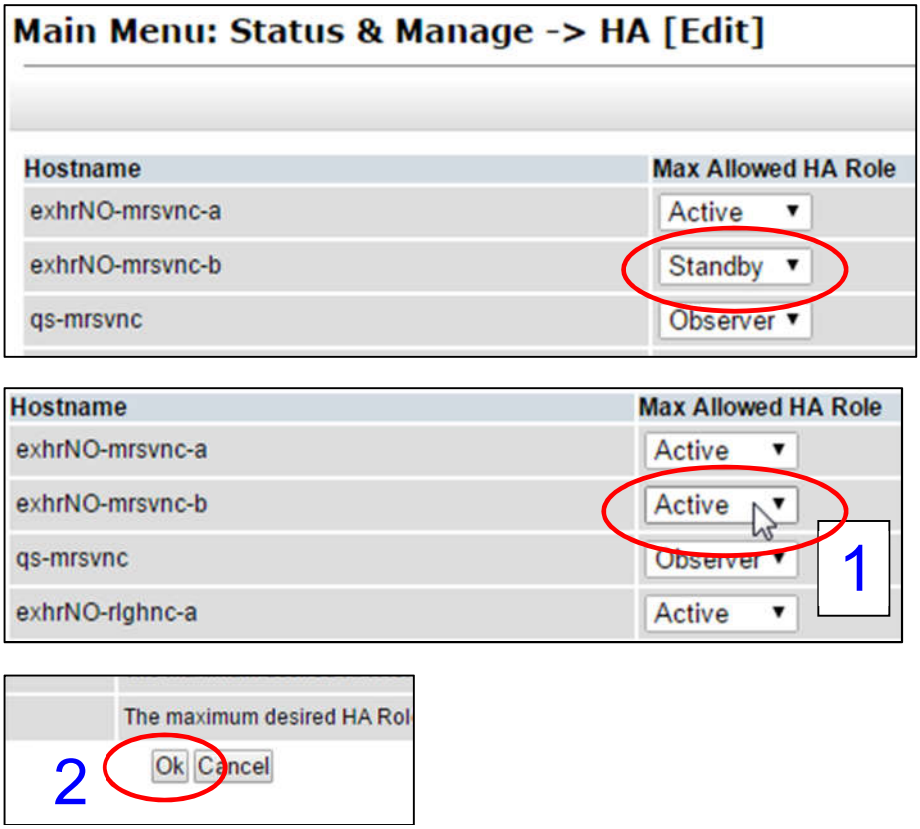
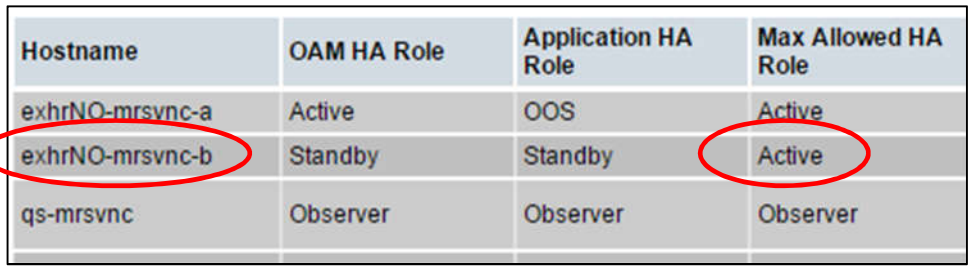
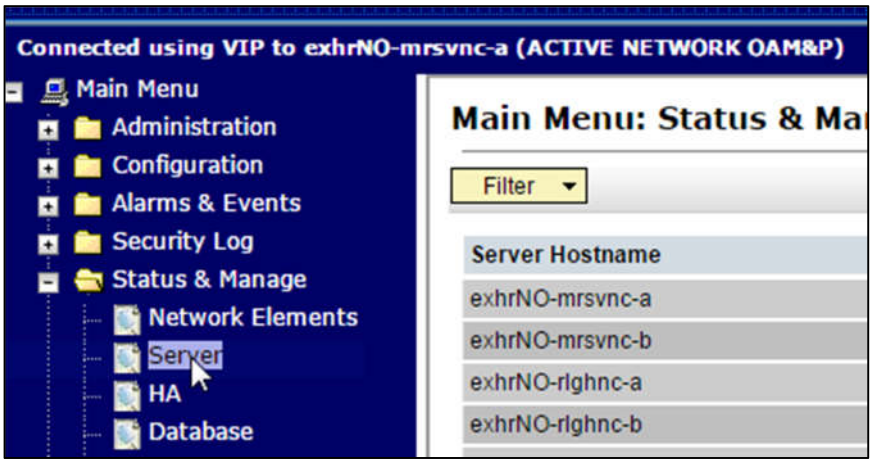
Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
24. ☐	**Primary NOAM VIP:** If not automatically **logged out** of the **GUI**, use the **[Logout]** link in the top right of the browser to logout of the **Primary HLRR NOAM GUI**.	
25. ☐	**Primary NOAM VIP (GUI):** **Clear the browser cache.** **!! IMPORTANT !!** ***DO NOT*** *proceed to the next step until the* ***browser cache*** *has been* ***cleared****.*	JavaScript libraries, images and other objects are often modified in the upgrade. Browsers can sometimes cause GUI problems by holding on to the old objects in the built-in cache. To prevent these problems always clear the browser cache before logging into an OAM GUI which has just been upgraded: **1)** Simultaneously hold down the **[Ctrl]**, **[Shift]** and **[Delete]** keys *(most Web browsers)*. **2)** Select the appropriate object types to delete from the cache via the pop-up dialog. *(e.g.* ***"Temporary Internet Files", "Cache"*** *or* ***"Cached images and files"****, etc.)*. Other browsers may label these objects differently. **3)** **Clear the cached data.**
26. ☐	Using the VIP address, access **the Primary HLRR NOAM GUI**.	• Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**

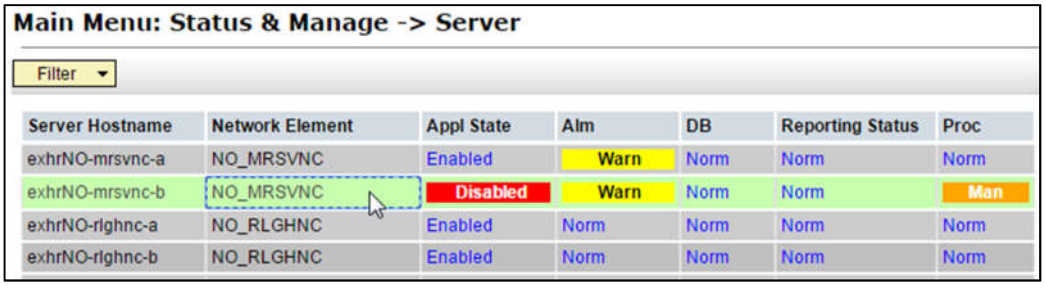
Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
27. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** → **Status & Manage** → **HA** **2)** Click on the "**Edit**" dialogue button.	

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
28. ☐	**Primary NOAM VIP:** **1)** Select the **"Standby" Primary HLRR NOAM** server and change a **Max Allowed HA Role** value from **"Standby"** to **"Active".** **2)** Press the "**Ok**" button at the bottom of the right panel.	
29. ☐	**Primary NOAM VIP:** Verify that the **Max Allowed HA Role** value has been updated to **"Active"** for the **"Standby" Primary NOAM** server.	
30. ☐	**Primary NOAM VIP:** Select… **Main Menu** → **Status & Manage** → ***Server*** …as shown on the right.	

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
31. ☐	**Primary NOAM VIP:** Using the vertical scroll bar in the right panel, scroll to the row containing the **hostname** of **"Standby"** *(fomerly Active)* **Primary NOAM** server. **NOTE:** *Although currently **"Standby"**, this is the same server that was identified and recorded as **"Active"** in **Step 6** of this procedure.*	
32. ☐	**Primary NOAM VIP:** **1)** Click the **"Restart"** dialogue buttom at the bottom of the right panel. **2)** Click the "**Ok**" button on the pop-up confirmation box.	 
33. ☐	**Primary NOAM VIP:** For the row containing the **hostname** of **"Standby"** *(fomerly Active)* **Primary NOAM** server. **1)** Verify that the **"Appl State"** changes to **"Enabled".** **2)** Verify that the **"Proc"** value changes to **"Norm".**	

NOTE: ***Steps 34*** *and* ***35*** *of this procedure may be executed in parallel.*

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
34. ☐	**Primary NOAM VIP:** Initiate upgrade for the **current "Standby" Primary NOAM** server.	**1.** Upgrade the **"Standby"** *(fomerly Active)* **Primary NOAM** server using **Appendix D** *(Server Upgrade Administration on HLRR 4.1)* **NOTE:** *Although currently **"Standby"**, this is the same server that was identified and recorded as **"Active"** in **Step 6** of this procedure.* **2.** In **Step 6** of this procedure, check-off ☒ the associated **check box** as the upgrade is completed for the upgraded **Primary NOAM "Active"** server.
35. ☐	**Primary NOAM VIP:** Initiate upgrade for the **Primary Query Server**.	**1.** Upgrade the **Primary Query Server** (as identified and recorded in **Step 6** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1)* **2.** In **Step 6** of this procedure, check-off ☒ the associated **check box** as the upgrade is completed for the upgraded **Primary Query Server**.
36. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT** proceed until **both** upgrades for the current **"Standby" Primary NOAM** server and the **Primary Query Server have** been successfully completed.*	**1.** Verify that **both** upgrades specified in **Steps 34** and **35** have been successfully completed. **2.** For upgrade from source release **HLRR 4.0**, **SKIP** to **Step 51** of this procedure.

Upgrade from HLRR 4.1 source only:		
37. ☐	**Primary NOAM VIP:** Initiate upgrade for the **"Standby" Primary NOAM** server.	**1.** Upgrade the **Primary NOAM "Standby" s**erver (as identified and recorded in **Step 6** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1)*. **2.** In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **Primary NOAM "Standby"** server.

38. ☐	**Primary NOAM VIP (CLI):**
	Using the **VIP** address, login to the **"Active" Primary NOAM server** with the **admusr** account.
		`CentOS release 6.7`
		`Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64`
		
		`exhrNO-mrsvnc-b login: admusr`
		`Password: <admusr_password>`

39. ☐	**Primary NOAM VIP:**
	The user will be presented with output similar to that shown to the right.
		***** TRUNCATED OUTPUT *****
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds`
		`PROMPATH=/opt/comcol/prod`
		`RUNID=00`
		`[admusr@exhrNO-mrsvnc-b ~]$`

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result

40. ☐	**Primary NOAM VIP:**
	Verify that the **DbReplication** status is **"Active"** to the **Standby Primary NOAM** which was upgraded in **Step 37** of this procedure.
		`[admusr@exhrNO-mrsvnc-b ~]$ sudo irepstat -w`
		`-- Policy 0 ActStb [DbReplication]`
		`AA To exhrNO-rlghnc-b Active 0 0.00 1%R 3%S 0.04%cpu 22B/s`
		`AA To exhrNO-mrsvnc-a Active 0 0.00 1%R 0.05%cpu 21B/s`
		`AA To qs-mrsvnc Active 0 0.00 1%R 3%S 0.05%cpu 22B/s`
		`AB To exhrSO-carync-a Active 0 0.00 1%R 3%S 0.05%cpu 22B/s`
		`AB To exhrSO-drhmnc-b Active 0 0.00 1%R 3%S 0.04%cpu 22B/s`
		
		`irepstat ( 7 lines) (h)elp`
		
		`[admusr@exhrNO-mrsvnc-b ~]$`

41. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT** proceed to the next step until a DbReplication status of **"Active"** is returned for the **Standby Primary NOAM** server.*	If a **DbReplication** status of **"Audit"** was received for the **Standby Primary NOAM** server in the previous step, then **REPEAT Step 40** of this procedure until a status of **"Active"** is returned.
42. ☐	**Primary NOAM VIP:** Exit the **CLI** for the **"Active" Primary NOAM** server.	`[admusr@exhrNO-mrsvnc-b filemgmt]$ exit` `logout`

NOTE: ***Steps 43** and **44** of this procedure may be executed in parallel.*

43. ☐	**Primary NOAM VIP:** Initiate upgrade for the **"Active" Primary NOAM** server. **!! IMPORTANT !!** *This will cause an HA activity Switchover to the mate Primary HLRR NOAM server. This will occur within a few minutes of initiating the upgrade.*	1. Upgrade the **Primary NOAM "Active"** server (as identified and recorded in **Step 6** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1)* 2. In **Step 6** of this procedure, check-off ☒ the associated **check box** as the upgrade is completed for the upgraded **Primary NOAM "Active"** server.
44. ☐	**Primary NOAM VIP:** Initiate upgrade for the **Primary Query Server**	1. Upgrade the **Primary Query Server** (as identified and recorded in **Step 6** of this procedure) using **Appendix D** (*Server Upgrade Administration on HLRR 4.1*) 2. In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **Primary Query Server.**

Procedure 4: Upgrade Primary NOAM NE

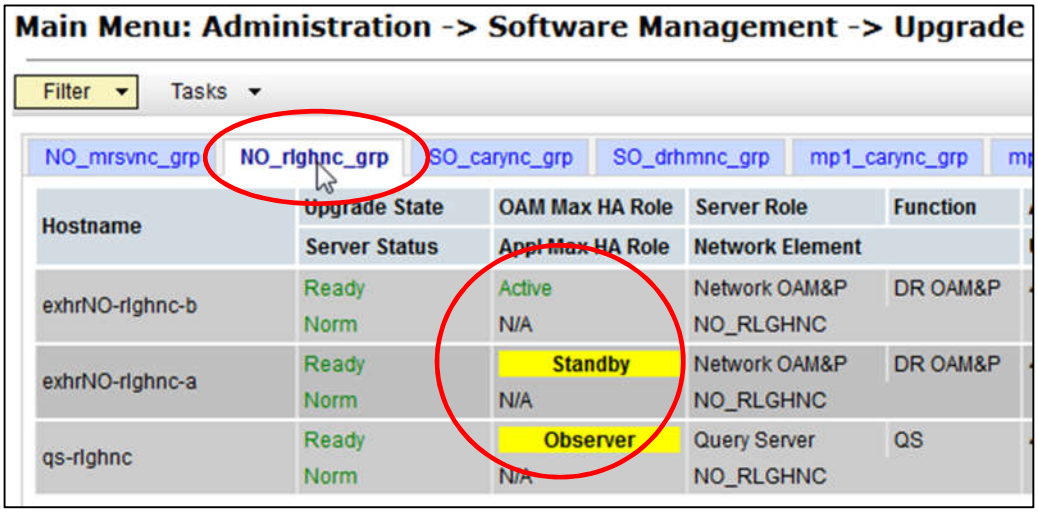
Step	Procedure	Result
45. ☐	**Primary NOAM VIP (CLI):** **!! IMPORTANT !!** ***DO NOT** execute this step until the upgrades specified in **Steps 43** and **44** of this procedure have both completed successfully.* Using the **VIP** address, login to the **"Active" Primary NOAM server** with the **admusr** account.	CentOS release 6.7 Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64 exhrNO-mrsvnc-b login: **admusr** Password: ***<admusr_password>***
46. ☐	**Primary NOAM VIP:** The user will be presented with output similar to that shown to the right.	***** TRUNCATED OUTPUT ***** RELEASE=6.4 RUNID=00 VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds PROMPATH=/opt/comcol/prod RUNID=00 [admusr@exhrNO-mrsvnc-b ~]$
47. ☐	**Primary NOAM VIP:** **Edit** the **ServiceCategory** table using the **"ivi"** utility.	[admusr@exhrNO-mrsvnc-a ~]$ **ivi ServiceCategory**
48. ☐	**Primary NOAM VIP:** Using the **VI Editor** command set, **add a line** for **ComAgent** to the bottom of the list using the values and syntax **exactly** as shown to the right. **NOTE:** *Numerical values for other line entries in the list may vary from what is shown to the right.*	#!/bin/sh iload -ha -xU -frecNum -fname -fintraSitePath -finterSitePath ServiceCategory \ <<'!!!!!' 0|Unspecified|NodeInfoPath|NodeInfoPath 1|OAM|INTERNALIMI|INTERNALXMI 2|Replication|INTERNALIMI|INTERNALXMI 3|Signaling|NodeInfoPath|NodeInfoPath 5|HA_Secondary|INTERNALIMI|INTERNALXMI 7|HA_MP_Secondary|INTERNALIMI|INTERNALXMI 8|Replication_MP|INTERNALIMI|INTERNALXMI **20|ComAgent|NodeInfoPath|NodeInfoPath** !!!! ~ ~ ~

Procedure 4: Upgrade Primary NOAM NE

Step	Procedure	Result
49. ☐	**Primary NOAM VIP:** **1)** Using the **VI Editor** command set, save the file *(hit the **[ESC]** key to exit Edit mode, then type **":wq!"** and hit the **[ENTER]** key to write the change)*. **2)** Answer **"y"** whenn prompted to apply the changes.	~ ~ **:wq!** "/tmp/IvI18490" 12L, 411C written APPLY THE CHANGES [yn]? **y** LOADED OK [admusr@exhrNO-mrsvnc-a ~]$
50. ☐	**Primary NOAM VIP:** Verify that the **ServiceCategory** table now displays the **ComAgent** line **exactly** as shown to the right.	[admusr@exhrNO-mrsvnc-a ~]$ **iqt ServiceCategory |grep ComAgent** 20 ComAgent NodeInfoPath NodeInfoPath [admusr@exhrNO-mrsvnc-a ~]$
51. ☐	Proceed to **Procedure 5.**	• Execute **Procedure 5** at this time. **NOTE:** *In order to minimize possible impacts due to database schema changes, Primary and DR NOAM NE sites must be upgraded within the same maintenance window.*
THIS PROCEDURE HAS BEEN COMPLETED.		

6.3 Upgrade DR NOAM NE

Procedure 5: Upgrade DR NOAM NE

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** → **Administration** → **Software Management** → **Upgrade** **2)** Click on the **tab** associated with the **DR NOAM** Server Group. **3)** From the **"OAM Max HA Role"** field, identify the HA state of each server in the Server Group.	
3. ☐	**Primary NOAM VIP:** Record the names of **DR HLRR NE site** servers appropriately in the space provided to the right.	• Record the names of **DR NOAM NE site** servers ☐ **DR NOAM Active Server:** _____ ☐ **DR NOAM Standby Server:** _____ ☐ **DR Query Server** *(Observer)*: _____

NOTES:

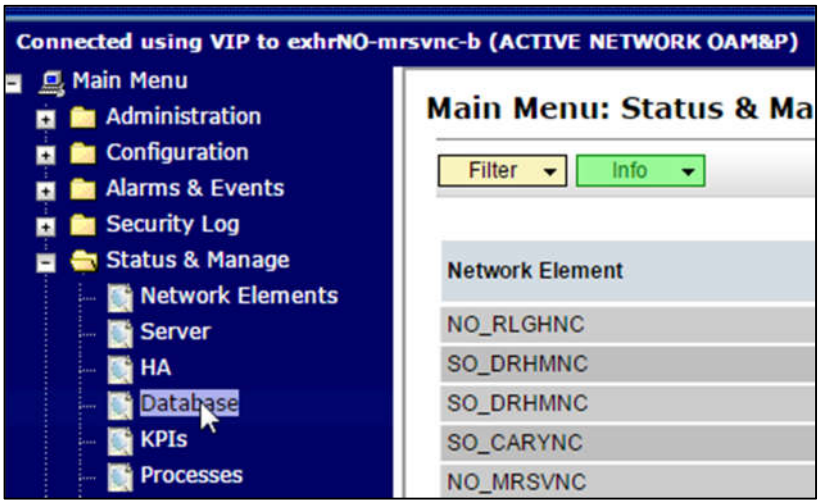
- ***Steps 4 - 6 of this procedure may be automated using the Server Group "Auto Upgrade" option (recommended).***

- or -

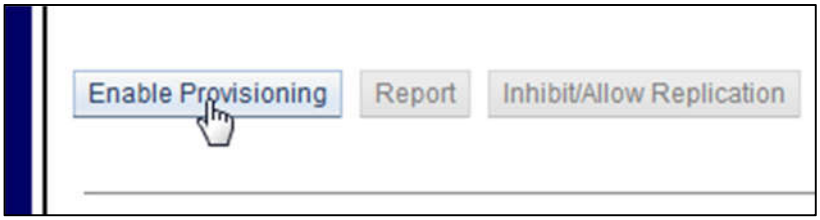
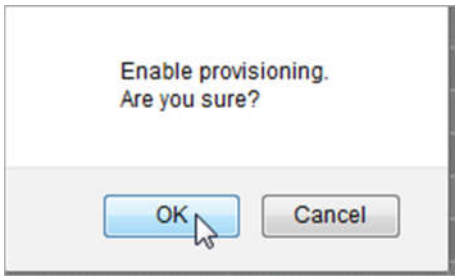
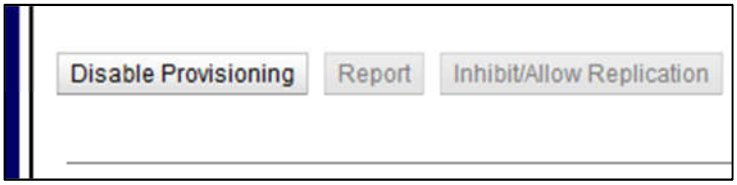
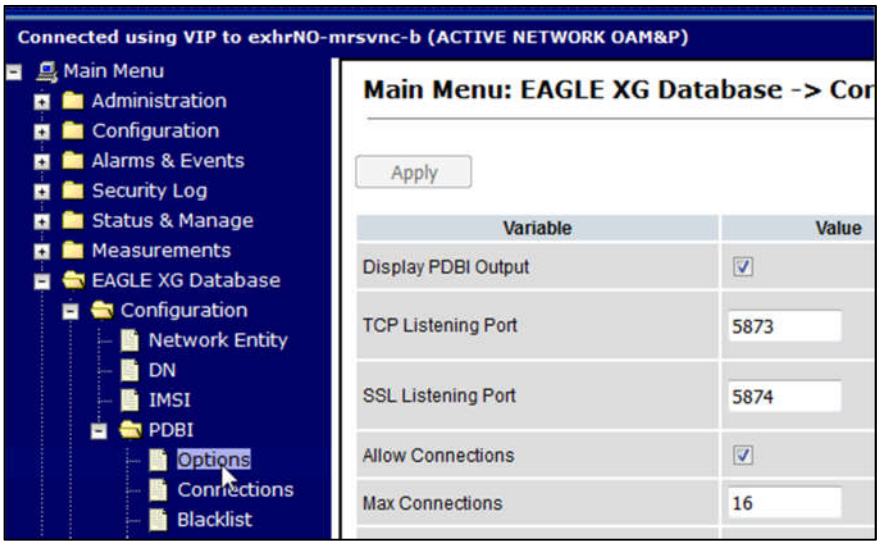
- ***Steps 4 and 5 of this procedure may be executed in parallel using the "Upgrade Server" option, and then after the completion of both upgrades, Step 6 may also be executed using the "Upgrade Server" option.***

4. ☐	**Primary NOAM VIP:** Upgrade **"Standby" DR NOAM** server.	**1.** Upgrade **"Standby" DR NOAM** server (as identified and recorded in **Step 3** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* **2.** In **Step 3** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **"Standby" DR NOAM** server.
5. ☐	**Primary NOAM VIP:** Upgrade **DR Query Server**	**1.** Upgrade **DR Query Server** (as identified and recorded in **Step 3** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* **2.** In **Step 3** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **DR Query Server.**

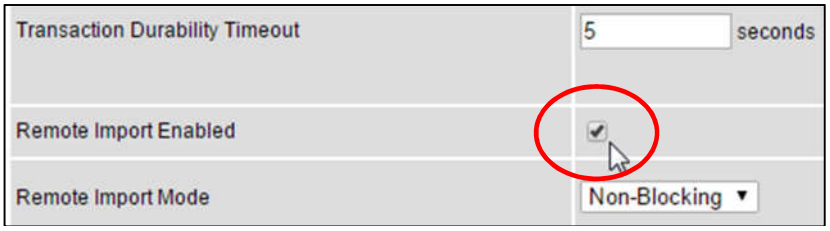
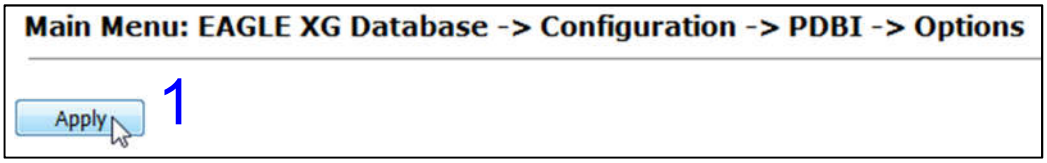
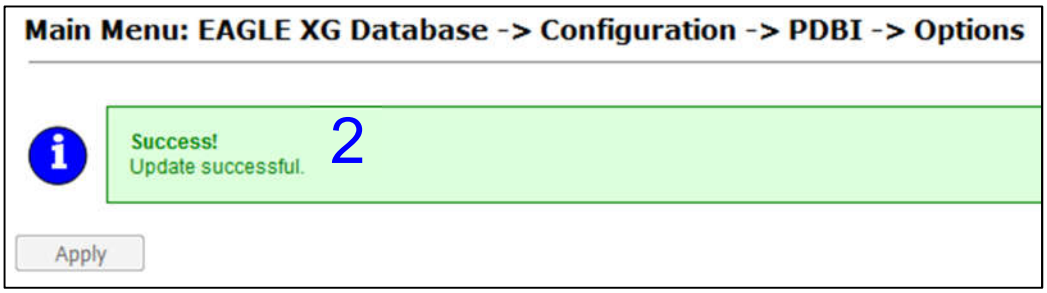
Procedure 5: Upgrade DR NOAM NE

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** *If upgrading the DR NOAM Server Group using the **"Upgrade Server"** option, **DO NOT** execute this step until the upgrade of the **"Standby" DR NOAM** and the **DR Query Server** have both completed successfully.* Upgrade the **"Active" DR HLRR NOAM** server. ***NOTE**: This will cause an HA activity failover to the mate DR HLRR NOAM server.*	• Upgrade the **"Active" DR NOAM** server (as identified and recorded in **Step 3** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* • In **Step 3** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **"Active" DR NOAM** server**.**
7. ☐	**Primary NOAM VIP:** Select… **Main Menu** → **Status & Manage** → ***Database*** …as shown on the right.	

Procedure 5: Upgrade DR NOAM NE

Step	Procedure	Result
8. ☐	**Primary NOAM VIP:** **1)** Click the **"Enable Provisioning"** dialogue button at the bottom of the right panel. **2)** Click the **"OK"** button on the confirmation pop-up box.	 
9. ☐	**Primary NOAM VIP:** Verify that the text on the dialogue button at the bottom of the right panel changes to state **"Disable Provisioning".**	
10. ☐	**Primary NOAM VIP:** Re-Enable Provisioning **Remote Import** *(if applicable)*.	• If the value for the **"Remote Import Enabled"** checkbox recorded in **Procedure 4**, **Step 8** was **CHECKED**, then continue with **Step 11** of this procedure. • If the value for the **"Remote Import Enabled"** checkbox recorded in **Procedure 4**, **Step 8** was **NOT CHECKED**, then **Procedure 5** *(Upgrade DR NOAM NE)* has been **COMPLETED. SKIP** the remaining steps of this procedure.
11. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ EAGLE XG Database** **→ Configuration** **→ PDBI** **→ *Options*** …as shown on the right.	

Procedure 5: Upgrade DR NOAM NE

Step	Procedure	Result
12. ☐	**Primary NOAM VIP:** Locate the **"Remote Import Enabled"** checkbox and make sure that it is checked *(**ADD** the check mark if necessary)*.	
13. ☐	**Primary NOAM VIP:** If the **Check mark** was **ADDED** to the **"Remote Import Enabled"** checkbox in the previous step, then execute the following: **1)** Click the **"Apply"** dialogue box in the top left of the right panel. **2)** Verify that a **"Success!"** response is received in the banner.	 
THIS PROCEDURE HAS BEEN COMPLETED		

6.4 Perform Health Check *(Primary/DR NOAM Post Upgrade)*

This procedure is used to determine the health and status of the entire HLR Router network and servers after Primary and DR NOAM upgrade has been completed.

☐ Execute HLR Router Health Check procedures as specified in **Appendix B.**

7. SOAM UPGRADE EXECUTION

Call **My Oracle Support (MOS)** and inform them of your plans to upgrade this system prior to executing this upgrade.

Refer to **Appendix J:** Accessing My Oracle Support (MOS) for information on contacting **MOS**.

Before upgrade, users must perform the system Health Check **Appendix B.** This check ensures that the system to be upgraded is in an upgrade-ready state. Performing the system health check determines which alarms are present in the system and if upgrade can proceed with alarms.

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

If there are servers in the system, which are not in Normal state, these servers should be brought to the Normal or the Application Disabled state before the upgrade process is started. The sequence of upgrade is such that servers providing support services to other servers will be upgraded first.

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

Please read the following notes on this procedure:

If a procedural STEP fails to execute successfully or fails to receive the desired output, **STOP** and contact **MOS** for assistance before attempting to continue.

Procedure completion times shown here are estimates. Times may vary due to differences in database size, user experience, and user preparation.

here possible, command response outputs are shown as accurately as possible. EXCEPTIONS are as follows:

- Session banner information such as time and date.
- System-specific configuration information such as hardware locations, IP addresses and hostnames.
- ANY information marked with “XXXX” or “YYYY.” Where appropriate, instructions are provided to determine what output should be expected in place of “XXXX or YYYY”
- Aesthetic differences unrelated to functionality such as browser attributes: window size, colors, toolbars and button layouts.

After completing each step and at each point where data is recorded from the screen, the technician performing the upgrade must mark the provided Check Box.

For procedures which are executed multiple times, a mark can be made below the Check Box (in the same column) for each additional iteration the step is executed.

Retention of Captured data is required as a future support reference if this procedure is executed by someone other than Oracle’s Tekelec Customer Care Center.

NOTE: *For large systems containing multiple Signaling Network Elements, it may not be feasible to apply the software upgrade to every Network Element within a single maintenance window.*

7.1 Perform Health Check *(SOAM Pre Upgrade)*

This procedure is part of Software Upgrade Preparation and is used to determine the health and status of the entire HLR Router network and servers. This may be executed multiple times but must also be executed at least once within the time frame of 24-36 hours prior to the start of a maintenance window.

☐ Execute HLR Router Health Check procedures as specified in **Appendix B.**

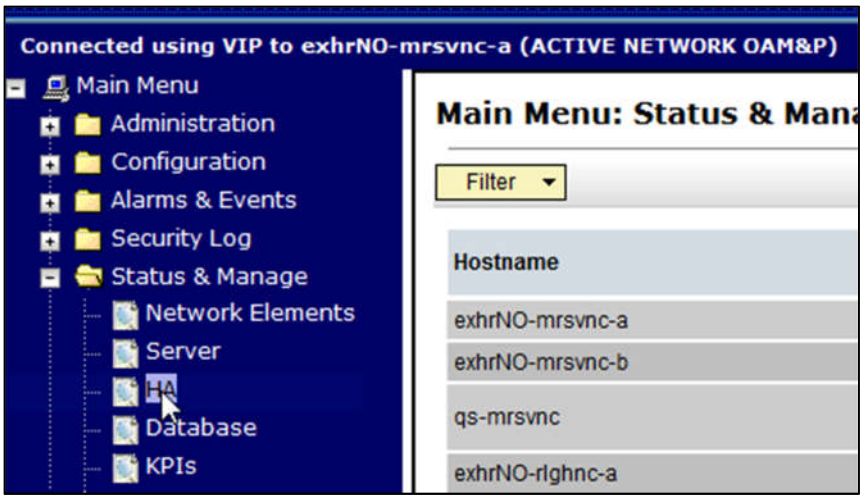
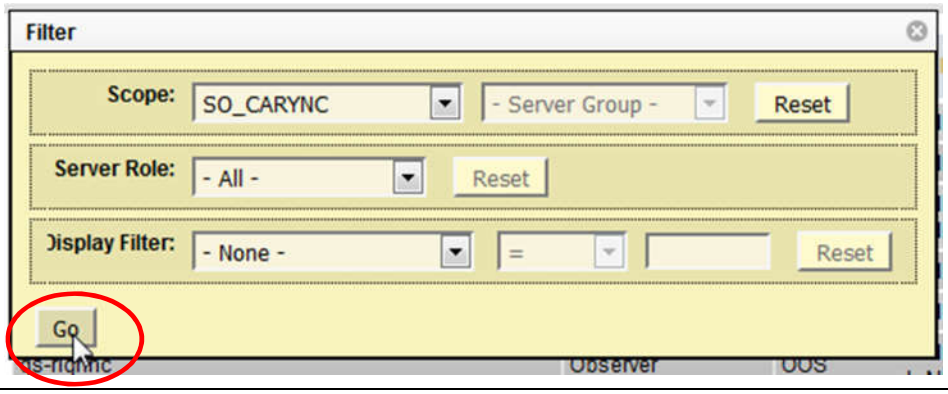
7.2 Upgrade SOAM NE

The following procedure details how to upgrade HLR Router SOAM sites.

NOTE: *When upgrading an **HLR Router** topology, it is permissible to upgrade multiple **SOAM** sites in **parallel**.*

*However, every attempt should be made to **AVOID upgrading Mated SOAM sites in the same maintenace window**.*

Procedure 6: Upgrade SOAM NE

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	Record the name of the **SOAM NE** site in the space provided to the right.	Using the information provided in **Section 3.1.2** (Logins, Passwords and Site Information) record the name of the **SOAM NE** site in the space provided below: **SOAM NE site:** _____
3. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Status & Manage → HA** …as shown on the right.	
4. ☐	**Primary NOAM VIP:** **1)** From the **"Scope"** filter pull-down, select the **Network Element** name for the **SOAM NE site** **2)** Click on the **"Go"** dialogue button	

Procedure 6: Upgrade SOAM NE

Step	Procedure	Result
5. ☐	**Primary NOAM VIP:** The user should be presented with the list of servers associated with the **SOAM NE site** Identify "**Hostname**", its **"Server Role"** and **"OAM HA Role"**	

Hostname	OAM HA Role	Application HA Role	Max Allowed HA Role	Mate Hostname List	Network Element	Server Role
exhrSO-carync-a	Active	OOS	Active	exhrSO-carync-b	SO_CARYNC	System OAM
exhrSO-carync-b	Standby	Standby	Active	exhrSO-carync-a	SO_CARYNC	System OAM
mp1-carync	Active	Active	Active		SO_CARYNC	MP
mp2-carync	Active	OOS	Active		SO_CARYNC	MP

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** Record the names of the **SOAM NE site** servers in the space provided.	☐ **Active SOAM Server:** _____ ☐ **Standby SOAM Server:** _____ ☐ **MP-1 Server**: _____ ☐ **MP-5 Server**: _____ ☐ **MP-2 Server**: _____ ☐ **MP-6 Server**: _____ ☐ **MP-3 Server**: _____ ☐ **MP-7 Server**: _____ ☐ **MP-4 Server**: _____ ☐ **MP-8 Server**: _____

NOTES:

- ***Steps 7 - 8 of this procedure may be automated using the Server Group "Auto Upgrade" option (recommended).***

- or -

- ***Step 7 of this procedure may be executed using the "Upgrade Server" option, and then after the "Standby" SOAM server upgrade completes, Step 7 may also be executed using the "Upgrade Server" option.***

Step	Procedure	Result
7. ☐	**Primary NOAM VIP:** Upgrade the **"Standby" SOAM** server. ***NOTE**: If using the "Auto Upgrade" option, SOAM servers shall be upgraded serially (Standby then Active).*	• Upgrade the **"Standby" SOAM** server (as identified and recorded in **Step 6** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* • In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **"Standby" SOAM** server.

Procedure 6: Upgrade SOAM NE

Step	Procedure	Result
8. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** *If upgrading the SOAM Server Group using the **"Upgrade Server"** option, **DO NOT** execute this step until the upgrade of the **"Standby" SOAM server** has completed successfully.* Upgrade the **"Active" SOAM** server.	• Upgrade the **"Active" SOAM** server (as identified and recorded in **Step 6** of this procedure) using **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* • In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **"Active" SOAM** server.

NOTE: ***Up to ½ of the installed MP servers at a SOAM site may be upgraded in parallel using the "Upgrade Server" option for each individual MP server.***

9. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT** execute this step until the upgrade of **BOTH SOAM servers** has been completed successfully.* Upgrade up to ½ of the installed **MP** servers in **parallel** *(e.g. 1 of 2, 2 of 4, etc.)*.	• Upgrade up to ½ of the **MP** server(s) (as identified and recorded in **Step 6** of this procedure) in **parallel** usng the **"Upgrade Server"** option for each **MP** server as described in **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **MP** server(s). **!! IMPORTANT !!** Starting with **HLRR 4.1** *(i.e. post upgrade)*, the **Appl Max HA Role** will be displayed in the **Administration → Software → Upgrade** screen. This state is expected to be **OOS** for **HLRR MP** servers and can be safely ignored.
10. ☐	**Primary NOAM VIP:** Upgrade all remaining **MP Servers** in the **SOAM NE site.**	• Upgrade all remaining **MP Servers** (as identified and recorded in **Step 6** of this procedure) in **parallel** usng the **"Upgrade Server"** option for each **MP** server as described in **Appendix D** *(Server Upgrade Administration on HLRR 4.1).* • In **Step 6** of this procedure, check-off ☒ the associated **checkbox** as the upgrade is completed for the upgraded **MP** server(s)
THIS PROCEDURE HAS BEEN COMPLETED		

7.3 Perform Health Check *(SOAM Post Upgrade)*

This procedure is used to determine the health and status of the HLR Router network and servers after the completion of SOAM upgrade.

☐ Execute HLR Router Health Check procedures as specified in **Appendix B.**

8. UPGRADE ACCEPTANCE

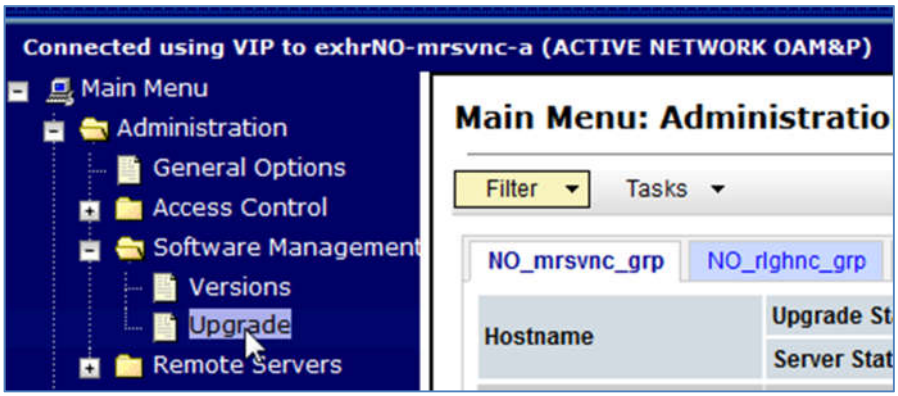
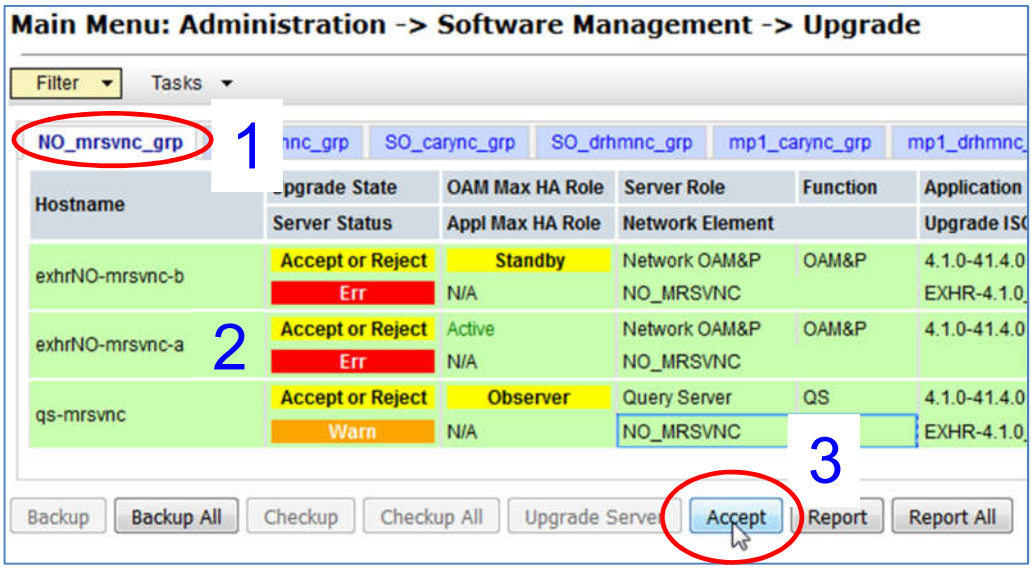
The upgrade needs either to be accepted or rejected before any subsequent upgrades may be performed in the future. **Event ID: 32532** *(Server Upgrade Pending Accept/Reject)* will be displayed for each server until one of these two actions (**Accept** or **Reject**) is performed.

STOP!

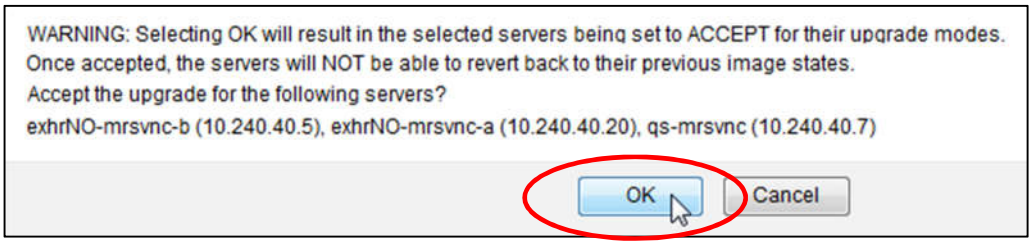
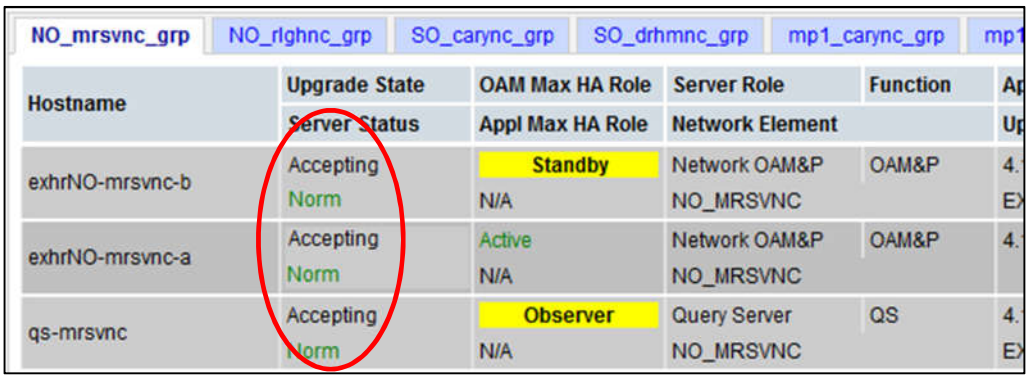
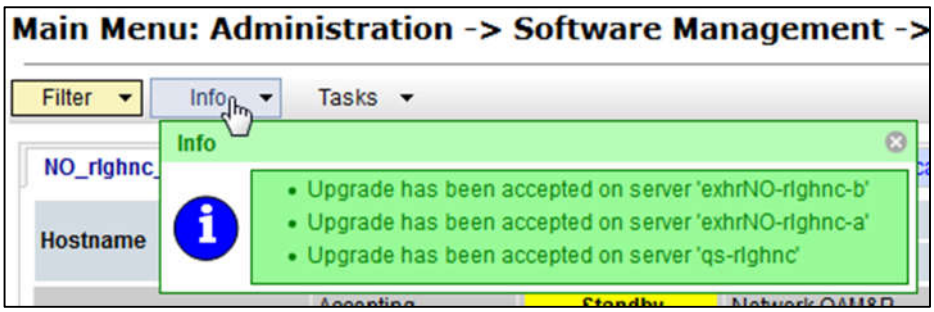
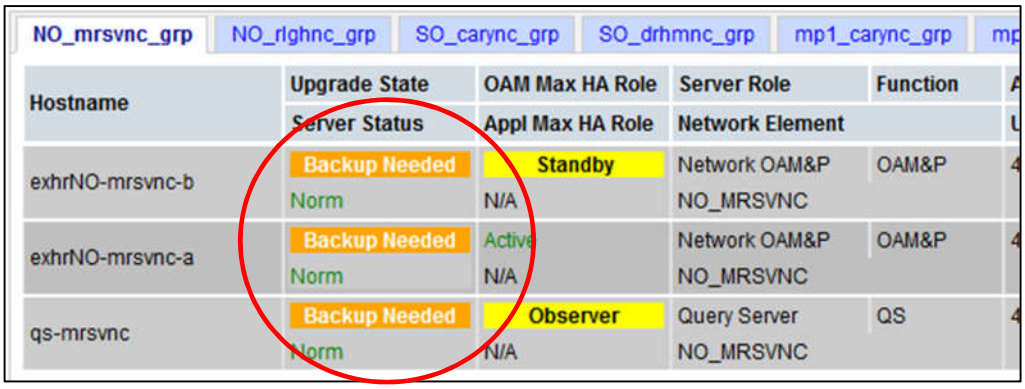
An upgrade should be **Accepted** only after all servers in the **HLR Router** topology have successfully completed upgrade to the target release.

The user should also be aware that **Upgrade Acceptance prevents any possibility of backout to the previous release!!!**

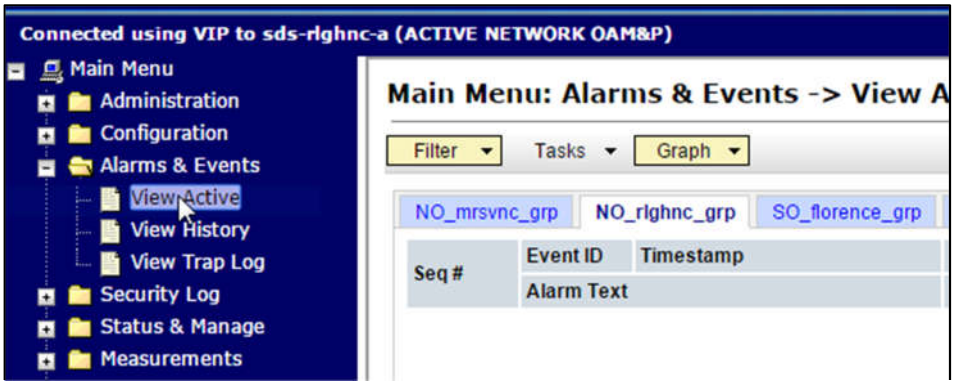
Procedure 7: Upgrade Acceptance

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** …as shown on the right.	
3. ☐	**Primary NOAM VIP:** **1)** Select the **Server Group** tab containing the server(s) to **"Accept"** upgrade. **2)** Hold down the **[CTRL]** key to **multi-select** the server(s) all server(s) in the Server Group. **3)** Click the "**Accept**" button.	

Procedure 7: Upgrade Acceptance

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** **1)** A Click the "**OK**" dialogue button in the pop-up confirmation box. **2)** The screen will now refresh and the **"Upgrade State"** will change to **"Accepting"**. **3)** The pull-down **"Info"** message in the banner will indicate that **"Upgrade has been accepted"** on each server.	  
5. ☐	**Primary NOAM VIP:** Within a few minutes, the screen will refresh and display an **"Upgrade State"** of **"Backup Needed"**. **!! IMPORTANT !!** *The **"Backup Needed" Upgrade State** is expected to remain until the next Software Upgrade is performed.* ***DO NOT** re-run COMCOL backups except when directed to do so during the next Upgrade process.*	

Procedure 7: Upgrade Acceptance

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** **"Accept"** Upgrade on each remaining **Server Group.**	• Repeat **Steps 3 - 5** of this procedure for each additional **Server Group** tab until Upgrade has been **Accepted** on all servers in the HLR Router topology.
7. ☐	**Primary NOAM VIP:** Select… **Main Menu** **→ Alarms & Events** **→View Active** …as shown on the right.	
8. ☐	**Primary NOAM VIP:** Verify Upgrade Acceptance.	Verify that the following Alarm is no longer present for any server in the **HLR Router** topology. • **Event ID (s):** ***32532*** *(Server Upgrade Pending Accept/Reject)*
THIS PROCEDURE HAS BEEN COMPLETED		

9. BACKOUT PROCEDURES

9.1 Backout Overview

Since software upgrade is a complex operation, the exact circumstances surrounding a failed upgrade cannot be predetermined. Therefore, the user is always directed to contact My Oracle Support (MOS) for assistance before executing any upgrade backout procedures (refer to **Appendix J:** *Accessing My Oracle Support (MOS)* for information on contacting MOS).

The procedures that follow assume that the entire HLR Router topology will backed out (i.e. all SOAM sites followed by the DR & Primary NOAM sites). If backout is required for an individual server rather than the entire topology, the user is directled to use **Appendix E** *(Backout of a Single Server)*.

!! WARNING !!

- **Do not attempt to perform these backout procedures without first contacting My Oracle Support (MOS).**
- **Backout procedures may cause traffic loss!**

NOTE: ***These recovery procedures are provided for the Backout of a Software Upgrade only! (i.e. for the Backout from a target release to the previously installed source release). Backout of an initial installation is not supported!***

9.2 Backout Setup

Identify the IP addresses of all servers that require backout.

1. From the **Primary NOAM GUI**, select the **[Main Menu: Administration → Software Management → Upgrade]** screen.
2. Under each Server Group tab, view the "Application Version" Column and identify the hostnames of all servers that require backout.
3. Select the **[Main Menu: Configuration → Servers]** screen.
    a. Click the **"Report"** dialogue button.
    b. Click the **"Save"** dialogue button and save the Servers report to a local workstation.
4. Identify the **XMI IP address** *(IMI IP address for T1200 MP servers)* for each hostname identified in **Step 2** above.
   These IP addresses are required to access the server CLI during backout.

NOTE: *Verify that the (2) COMCOL backup files created using* ***Procedure 3*** *- Full Database Backup (PROV & COMCOL ENV for All Servers) must be present on every server that is to be backed-out. These backup files are located in the* ***/var/TKLC/db/filemgmt*** *directory and have the following naming convention:*

- `Backup.<application>.<server>.FullDBParts.<role>.<date_time>.UPG.tar.bz2`
- `Backup. <application>.<server>.FullRunEnv.<role>.<date_time>.UPG.tar.bz2`

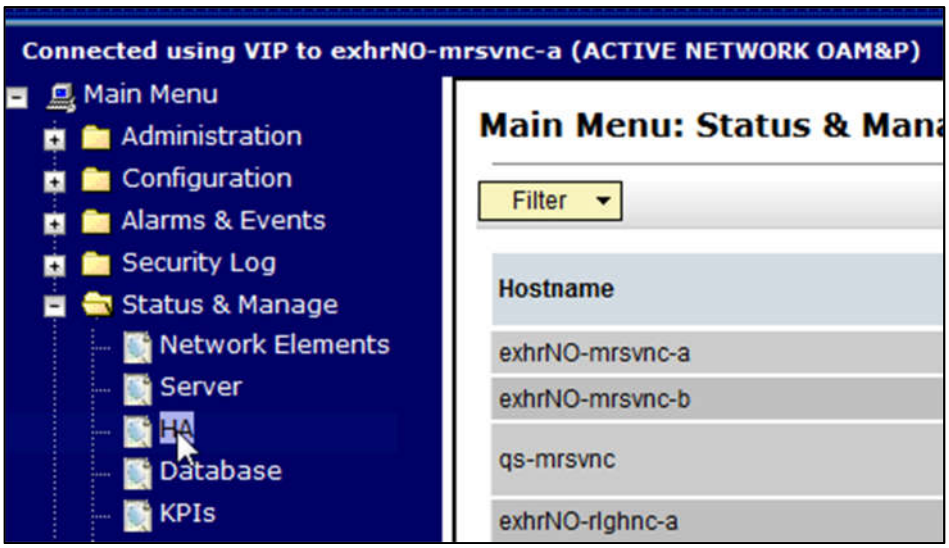
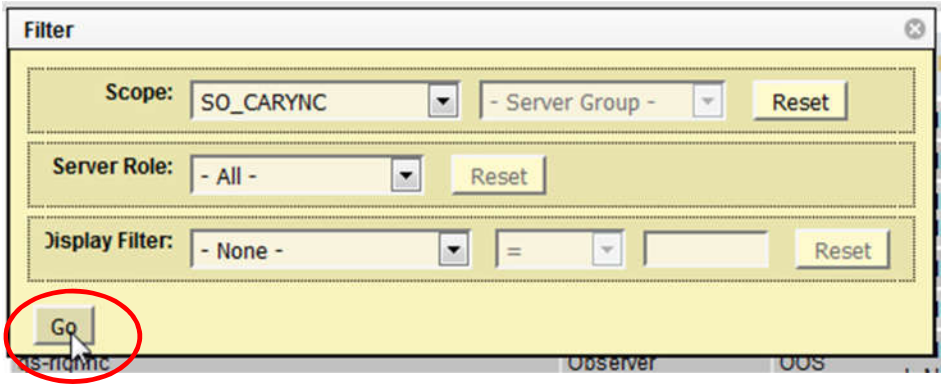
9.3 Perform Backout

Procedures used to perform upgrade backout should only be executed once all steps specified under **Secition 9.2** *(Backout Setup)* have been completed.

9.3.1 Backout of a SOAM NE

The following procedure details how to perform upgrade backout for all servers associated with the SOAM NE.

Procedure 8: Backout of a SOAM NE

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	Record the name of the **SOAM NE** site in the space provided to the right.	Using the information provided in **Section 3.1.2** (Logins, Passwords and Site Information) record the name of the **SOAM NE** site in the space provided below: **SOAM NE site:** _____
3. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** → **Status & Manage** → **HA** …as shown on the right.	
4. ☐	**Primary NOAM VIP:** **1)** From the **"Scope"** filter pull-down, select the **Network Element** name for the **SOAM NE site** **2)** Click on the **"Go"** dialogue button	

Procedure 8: Backout of a SOAM NE

<table>
<tr><th>Step</th><th>Procedure</th><th>Result</th></tr>
<tr><td>5.
☐</td><td>Primary NOAM VIP:
The user should be presented with the list of servers associated with the SOAM NE site

Identify “Hostname”, its “Server Role” and “OAM HA Role”</td><td>
<table>
<tr><th>Hostname</th><th>OAM HA Role</th><th>Application HA Role</th><th>Max Allowed HA Role</th><th>Mate Hostname List</th><th>Network Element</th><th>Server Role</th></tr>
<tr><td>exhrSO-carync-a</td><td>Active</td><td>OOS</td><td>Active</td><td>exhrSO-carync-b</td><td>SO_CARYNC</td><td>System OAM</td></tr>
<tr><td>exhrSO-carync-b</td><td>Standby</td><td>Standby</td><td>Active</td><td>exhrSO-carync-a</td><td>SO_CARYNC</td><td>System OAM</td></tr>
<tr><td>mp1-carync</td><td>Active</td><td>Active</td><td>Active</td><td></td><td>SO_CARYNC</td><td>MP</td></tr>
<tr><td>mp2-carync</td><td>Active</td><td>OOS</td><td>Active</td><td></td><td>SO_CARYNC</td><td>MP</td></tr>
</table>
</td></tr>
<tr><td>6.
☐</td><td>Primary NOAM VIP:
Record hostnames of the SOAM NE site servers in the spaces provided to the right.</td><td>
• Record the names of SOAM NE site servers:

☐ Active SOAM Server: _____

☐ Standby SOAM Server: _____

☐ MP-1 Server: _____ ☐ MP-6 Server: _____

☐ MP-2 Server: _____ ☐ MP-7 Server: _____

☐ MP-3 Server: _____ ☐ MP-8 Server: _____

☐ MP-4 Server: _____ ☐ MP-9 Server: _____

☐ MP-5 Server: _____ ☐ MP-10 Server: _____
</td></tr>
<tr><td>7.
☐</td><td>Primary NOAM VIP:
Backout the MP-1 server.</td><td>
• Backout the MP-1 server (as identified and recorded in Step 6 of this procedure) using Appendix E (Backout of a Single Server).

• In Step 6 of this procedure, check-off ☒ the associated check box as the backout is completed for the MP-1 server.
</td></tr>
<tr><td>8.
☐</td><td>Primary NOAM VIP:
Backout all remaining MP servers in the associated SOAM NE.

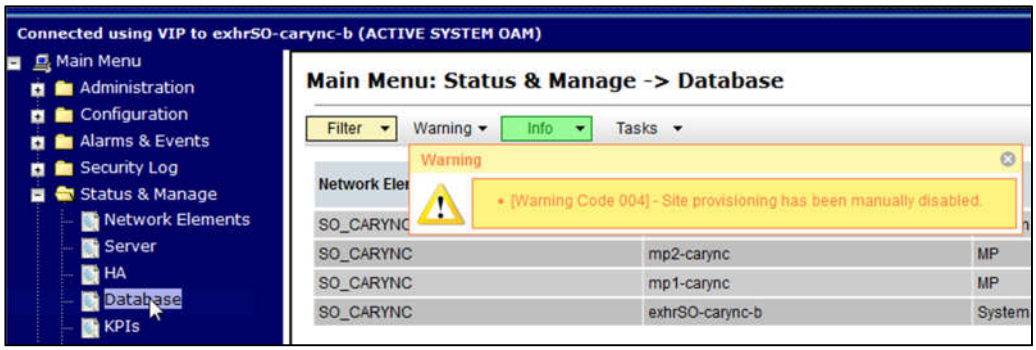
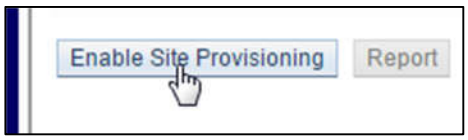
NOTE: If the backouts of the remaining MP servers are to be staggered, repeat this step until all MP servers within the SOAM NE have completed Appendix E (Backout of a Single Server).</td><td>
• Backout the remaining MP servers (as identified and recorded in Step 6 of this procedure) using Appendix E (Backout of a Single Server).

• In Step 6 of this procedure, check-off ☒ the associated check box as the backout is completed for each MP server.
</td></tr>
</table>

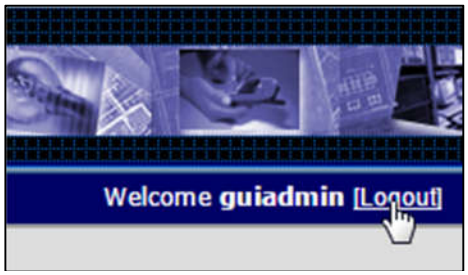
Procedure 8: Backout of a SOAM NE

Step	Procedure	Result
9. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT*** *execute this step until the backout of all* ***MP servers*** *associated with the* ***SOAM NE*** *have been completed successfully.* Backout the **"Standby" SOAM server.**	• Backout the **"Standby" SOAM server** (as identified and recorded in **Step 6** of this procedure) using **Appendix E** (Backout of a Single Server). • In **Step 6** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **"Standby" SOAM server.**

DO NOT proceed with the next step until Steps 7 - 9 of this procedure have been successfully completed.

10. ☐	**Primary NOAM VIP:** Backout the **"Active" SOAM server.**	• Backout the **"Active" SOAM server** (as identified and recorded in **Step 6** of this procedure) using **Appendix E** (Backout of a Single Server) • In **Step 6** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **"Active" SOAM server.**
11. ☐	Using the VIP address, access the **SOAM GUI**.	• Using the VIP address, access the **SOAM** GUI as described in **Appendix A.**
12. ☐	**SOAM VIP (GUI):** Select… **Main Menu** → **Status & Manage** → **Dstabase** …as shown on the right.	
13. ☐	**SOAM VIP:** **1)** Click the **"Enable Site Provisioning"** button in the lower left of the right panel. **2)** Click the **"OK"** button on the pop-up confirmation dialogue box.	 

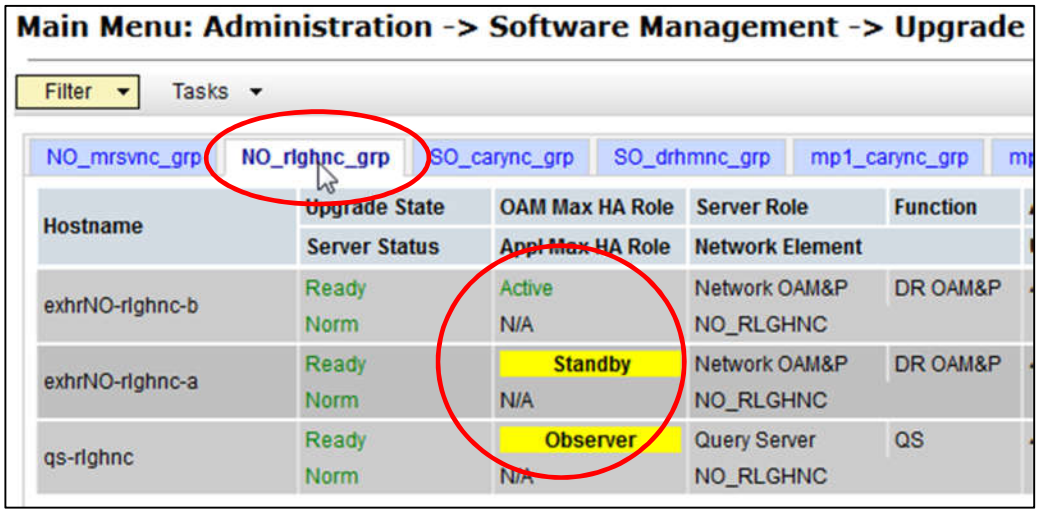
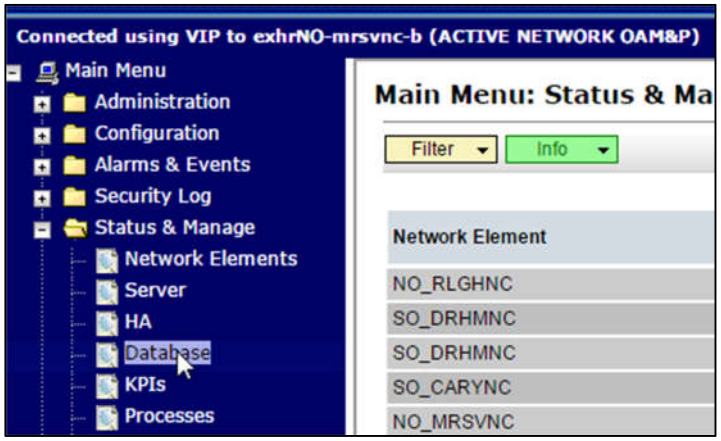
Procedure 8: Backout of a SOAM NE

Step	Procedure	Result
14. ☐	**SOAM VIP:** Use the **[Logout]** link in the top right of the browser to logout of the **SOAM GUI**.	
15. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
16. ☐	**Primary NOAM VIP (GUI):** Execute backout for the remaining **SOAM NE site(s).**	• Repeat **Steps 1 - 16** of this procedure for each remaining **SOAM NE site(s)** requiring backout. **NOTE:** *If backout of the remaining **SOAM NE site(s)** cannot be completed in a single Maintenance Window, the user should be aware that it is not recommended to leave servers within the same NE on different software releases for normal operation (i.e **DO NOT** start backout procedures on a NE unless all servers within the NE can be completed within the given Maintenance Window).*
17. ☐	Execute a **post SOAM backout** Health Check at this time.	• Execute a **Health Check** as specified in **Appendix B** *(Health Check Procedures)*, if no other **SOAM NE sites** require backout in the given Maintenance Window.
THIS PROCEDURE HAS BEEN COMPLETED		

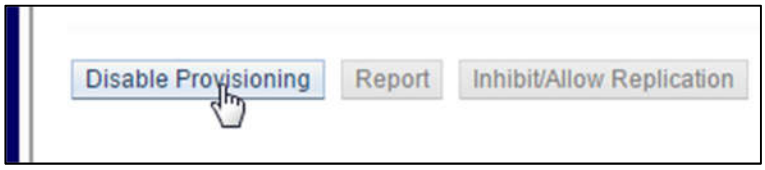
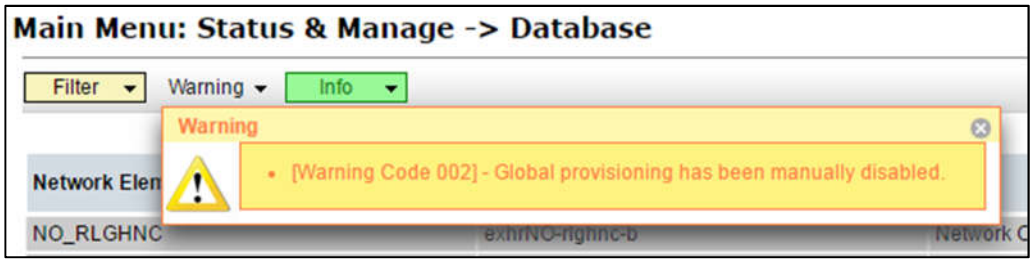
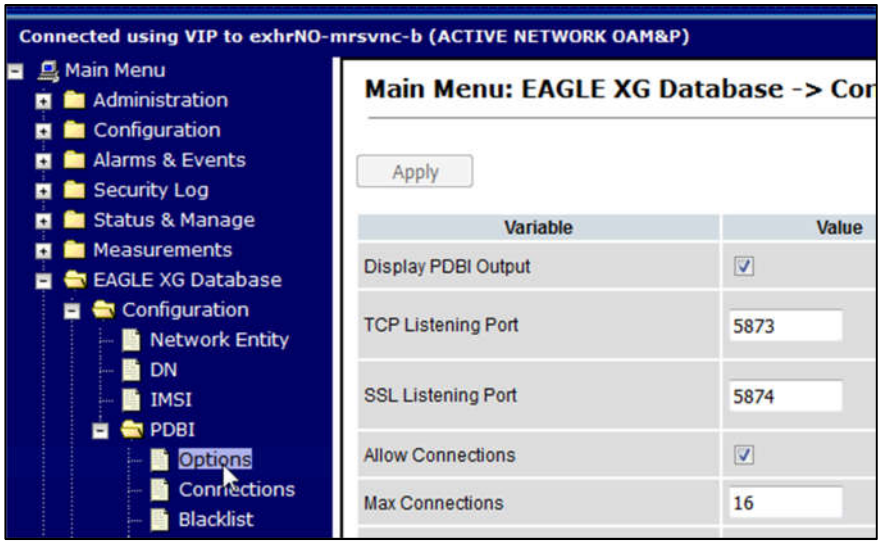
9.3.2 Backout of the DR NOAM NE

The following procedure details how to perform software backout for servers in the DR NOAM NE.

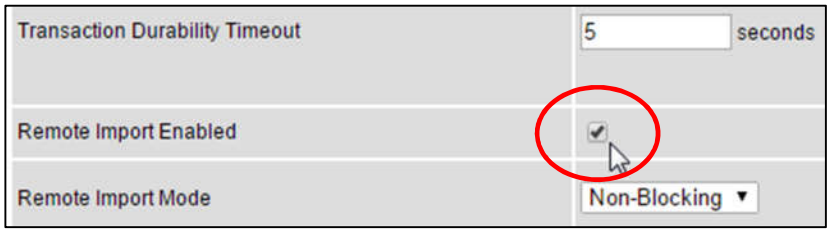
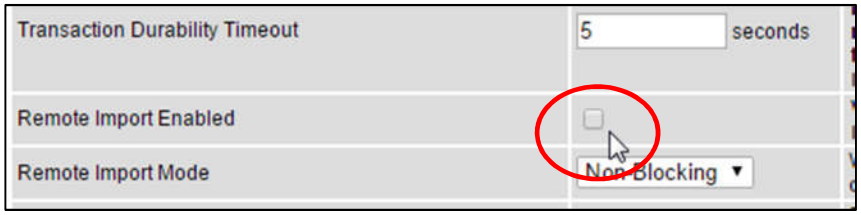
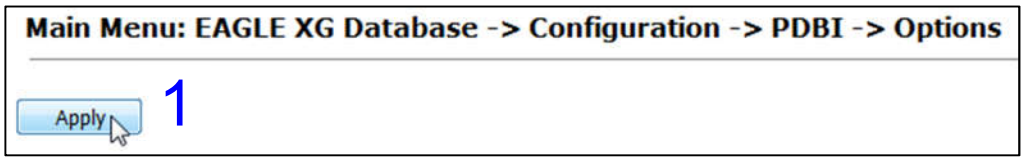
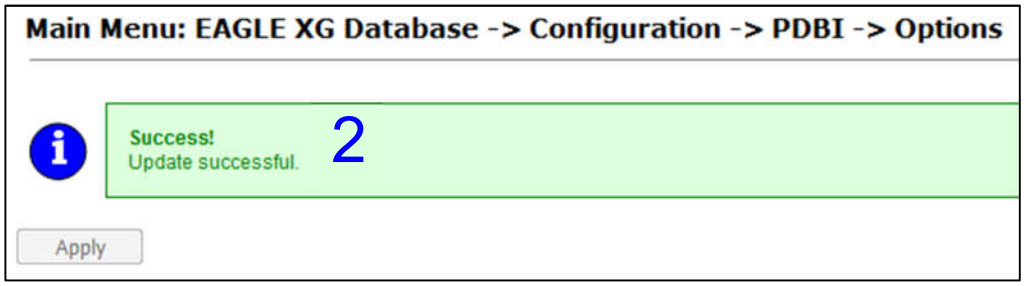
Procedure 9: Backout of the DR NOAM NE

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	Record the name of the **DR NOAM NE site** in the space provided to the right.	Using the information provided in **Section 3.1.2** *(Logins, Passwords and Site Information)* record the name of the **DR NOAM NE site** in the space provided below: **DR NOAM NE site:** _____
3. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Click on the **tab** associated with the **DR NOAM** Server Group. **3)** From the **"OAM Max HA Role"** field, identify the HA state of each server in the Server Group.	
4. ☐	**Primary NOAM VIP:** Record the names of **DR HLRR NE site** servers appropriately in the space provided to the right.	• Record the names of **DR HLRR NE site** servers ☐ **DR NOAM Active Server:** _____ ☐ **DR NOAM Standby Server:** _____ ☐ **DR Query Server** *(Observer)*: _____
5. ☐	**Primary NOAM VIP:** Select… **Main Menu** **→ Status & Manage** **→ *Database*** …as shown on the right.	

Procedure 9: Backout of the DR NOAM NE

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** **1)** Click the **"Disable Provisioning"** dialogue button at the bottom of the right panel. **2)** Click the **"OK"** button on the confirmation pop-up box.	 
7. ☐	**Primary NOAM VIP:** **1)** Verify that a **Warning** message indicating that **"Global provisioning has been manually disabled"** will appear in the banner. **2)** Verify that the text on the dialogue button at the bottom of the right panel changes to state **"Enable Provisioning".** **NOTE:** ***Event ID 10008*** *(Provisioning Manually Disabled) will appear at this time and can be safely ignored.*	 
8. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ EAGLE XG Database** **→ Configuration** **→ PDBI** **→ *Options*** …as shown on the right.	

Procedure 9: Backout of the DR NOAM NE

Step	Procedure	Result
9. ☐	**Primary NOAM VIP:** Locate the **"Remote Import Enabled"** checkbox and record the pre-upgrade state.	 Remote Import Enabled *(pre-upgrade state)*: ☐ CHECKED ☐ NOT CHECKED
10. ☐	**Primary NOAM VIP:** If the **"Remote Import Enabled"** checkbox was checked in the previous step, **REMOVE** the check mark.	
11. ☐	**Primary NOAM VIP:** If the **Check mark** was **REMOVED** from the **"Remote Import Enabled"** checkbox in the previous step, then execute the following: **1)** Click the **"Apply"** dialogue box in the top left of the right panel. **2)** Verify that a **"Success!"** response is received in the banner.	 

NOTE: ***Steps 12 and 13*** *of this procedure may be executed in parallel.*

12.	**Primary NOAM VIP:** Backout the **DR NOAM "Standby"** server.	• Backout the **DR NOAM "Standby" s**erver (as identified and recorded in **Step 4** of this procedure) using in **Appendix E** (Backout of a Single Server) • In **Step 4** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **DR NOAM "Standby"** server.

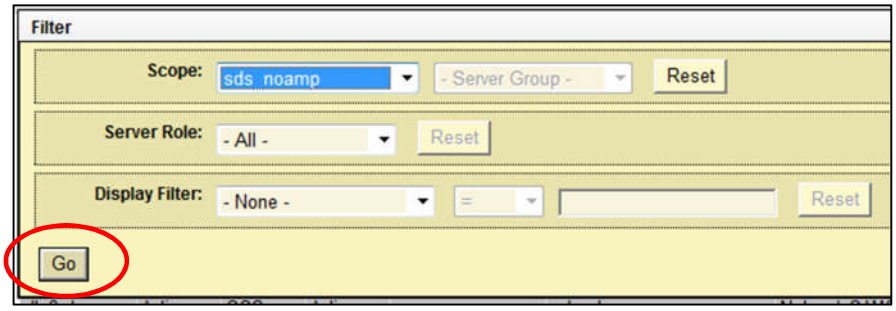
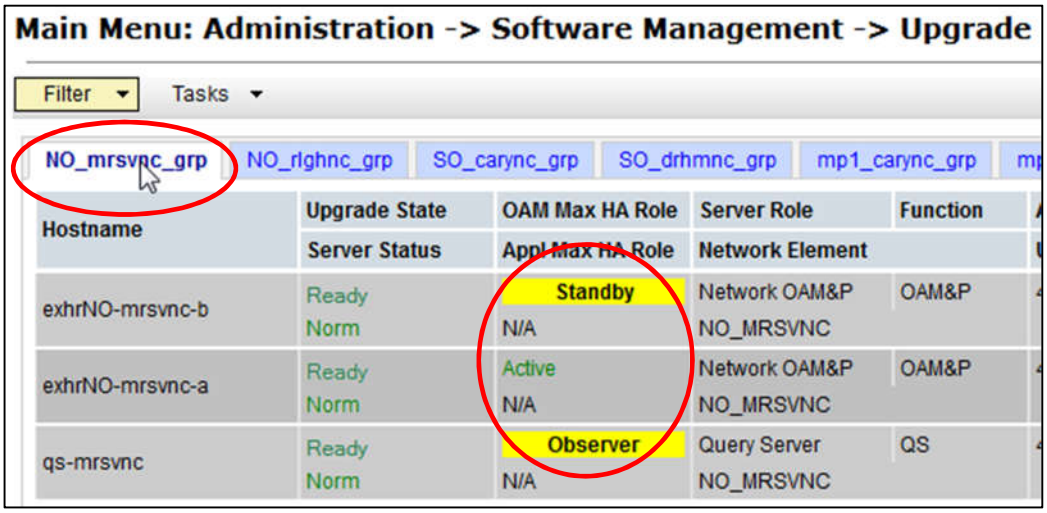
Procedure 9: Backout of the DR NOAM NE

Step	Procedure	Result
13. ☐	**Primary NOAM VIP:** Backout the **DR Query Server.**	• Backout the **DR Query Server** (as identified and recorded in **Step 4** of this procedure) using in **Appendix E** (Backout of a Single Server). • In **Step 4** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **DR Query Server.**
14. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT*** *execute this step until the backouts specified in* ***DR NOAM "Standby"*** *server and the* ***DR Query Server*** *have both completed successfully.* Backout the **DR "Active"** server.	• Backout **DR NOAM "Active"** server (as identified and recorded in **Step 4** of this procedure) using in **Appendix E** (Backout of a Single Server) **NOTE**: *This will cause an HA activity failover to the mate DR NOAM server. This should occur within minutes of initiating the upgrade.* • In **Step 4** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **DR NOAM "Active"** server.
15. ☐	**!! IMPORTANT !!** ***DO NOT*** *execute* ***Procedure 10*** *until the backouts for all* ***DR NOAM NE*** *servers (as identified and recorded in* ***Step 4*** *of this procedure) have completed successfully.* **Proceed to Procedure 10.**	• Execute **Procedure 10** at this time. **NOTE:** *In order to minimize possible impacts due to database schema changes, Primary and DR NOAM NE sites must be backed out within the same maintenance window.*
THIS PROCEDURE HAS BEEN COMPLETED		

9.3.3 Backout of the Primary NOAM NE

The following procedure details how to perform software Backout for servers in the Primary NOAM NE.

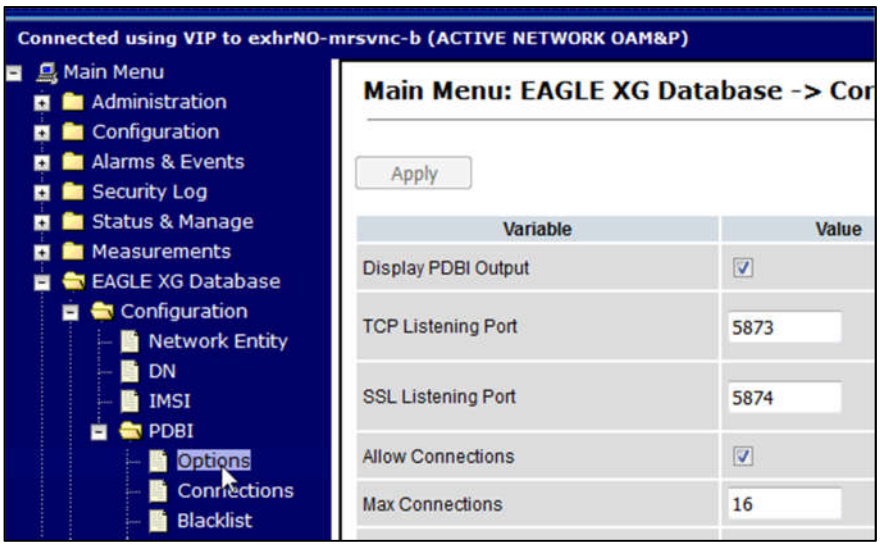
Procedure 10: Backout of the Primary NOAM NE

Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM** GUI.	• Using the VIP address, access the **Primary HLRR NOAM** GUI as described in **Appendix A.**
2. ☐	Record the name of the **Primary NOAM NE site** in the space provided to the right.	Using the information provided in **Section 3.1.2** *(Logins, Passwords and Site Information)* record the name of the **Primary NOAM NE site** in the space provided below: **Primary NOAM NE site:** _____
3. ☐	**Primary NOAM VIP:** **1)** From the **"Scope"** filter pull-down, select the Network Element name for the **Primary HLRR NE site** **2)** Click on the **"Go"** dialogue button located on the right end of the filter bar.	
4. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** → **Administration** →**Software Management** → **Upgrade** **2)** Click on the **tab** associated with the **Primary NOAM** Server Group. **3)** From the **"OAM Max HA Role"** field, identify the HA state of each server in the Server Group.	
5. ☐	**Primary NOAM VIP:** Record the names of the **Primary NOAM NE site** servers appropriately in the space provided to the right.	• Record the names of **Primary HLRR NE site** servers ☐ **Primary NOAM Active Server:** _____ ☐ **Primary NOAM Standby Server:** _____ ☐ **Primary Query Server** *(Observer)*: _____

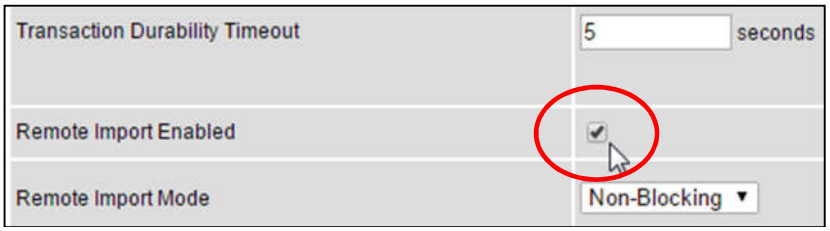
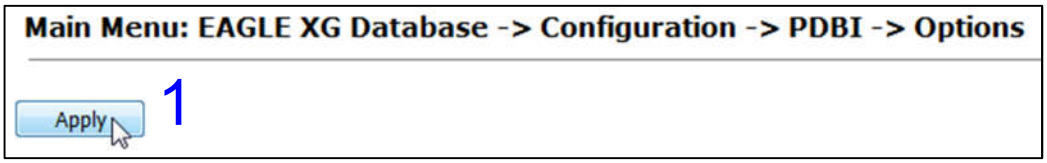
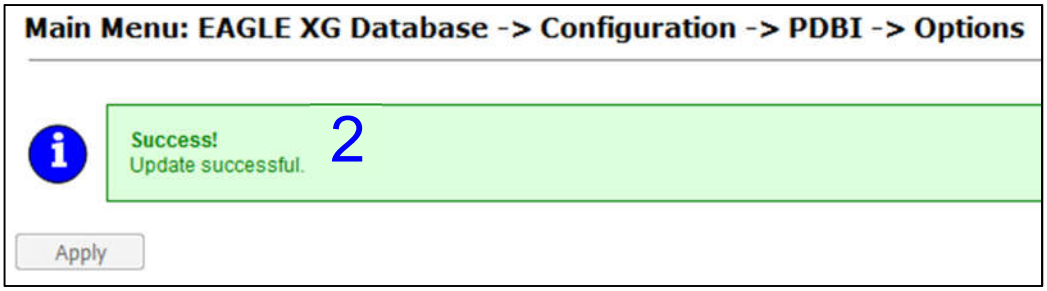
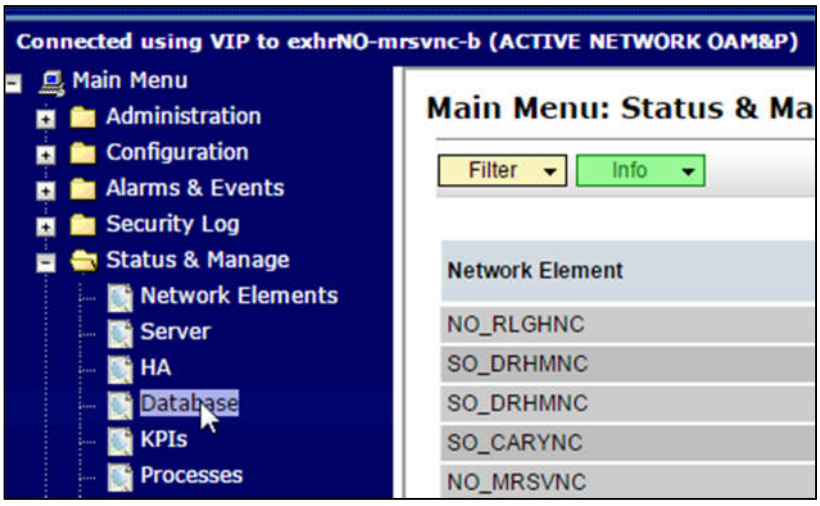
Procedure 10: Backout of the Primary NOAM NE

Step	Procedure	Result
		NOTE: ***Steps 6 and 7 of this procedure may be executed in parallel.***
6. ☐	**Primary NOAM VIP:** Backout the **Primary NOAM "Standby"** server.	• Backout the **Primary NOAM "Standby" s**erver (as identified and recorded in **Step 5** of this procedure) using in **Appendix E** (Backout of a Single Server) • In **Step 5** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **Primary NOAM "Standby"** server.
7. ☐	**Primary NOAM VIP:** Backout the **Primary Query Server.**	• Backout the **Primary Query Server** (as identified and recorded in **Step 5** of this procedure) using in **Appendix E** (Backout of a Single Server). • In **Step 5** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the **Primary Query Server.**
8. ☐	**Primary NOAM VIP (CLI):** Using the **VIP** address, login to the **"Active" Primary NOAM** server with the **admusr** account.	CentOS release 6.7 Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64 exhrNO-mrsvnc-a login: **admusr** Password: ***<admusr_password>***
9. ☐	**Primary NOAM VIP:** The user will be presented with output similar to that shown to the right.	***** TRUNCATED OUTPUT ***** RELEASE=6.4 RUNID=00 VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds PROMPATH=/opt/comcol/prod RUNID=00 [admusr@exhrNO-mrsvnc-a ~]$
10. ☐	**Primary NOAM VIP:** Verify that the **DbReplication** status is **"Active"** to the **Standby Primary NOAM** server which was backed out in **Step 6** of this procedure.	[admusr@exhrNO-mrsvnc-a ~]$ **sudo irepstat -w** -- Policy 0 ActStb [DbReplication] AA To exhrNO-rlghnc-b Active 0 0.00 1%R 3%S 0.04%cpu 22B/s AA To **exhrNO-mrsvnc-b Active** 0 0.00 1%R 0.05%cpu 21B/s AA To qs-mrsvnc Active 0 0.00 1%R 3%S 0.05%cpu 22B/s AB To exhrSO-carync-a Active 0 0.00 1%R 3%S 0.05%cpu 22B/s AB To exhrSO-drhmnc-b Active 0 0.00 1%R 3%S 0.04%cpu 22B/s irepstat (7 lines) (h)elp [admusr@exhrNO-mrsvnc-a ~]$
11. ☐	**Primary NOAM VIP:** **!! IMPORTANT !!** ***DO NOT** proceed to the next step until a DbReplication status of **"Active"** is returned for the **Standby Primary NOAM** server.*	If a **DbReplication** status of **"Audit"** was received for the **Standby Primary NOAM** server in the previous step, then **REPEAT Step 10** of this procedure until a status of **"Active**" is returned.

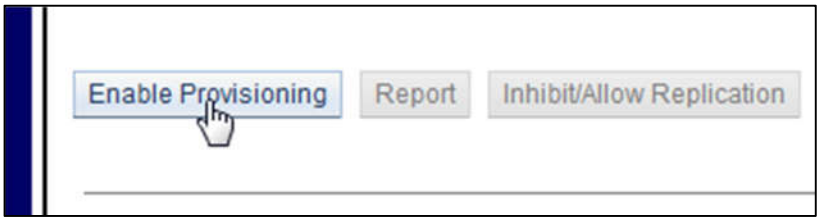
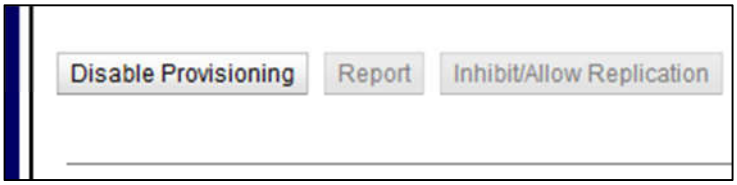
Procedure 10: Backout of the Primary NOAM NE

Step	Procedure	Result
12. ☐	**Primary NOAM VIP:** Exit the **CLI** for the **"Active" Primary NOAM** server.	`[admusr@exhrNO-mrsvnc-b filemgmt]$ exit` `Logout`
13. ☐	**Primary NOAM VIP (GUI):** Backout **Primary NOAM "Active"** server. **!! IMPORTANT !!** *This will cause an HA activity Switchover to the mate Primary HLRR NOAM server.*	• Backout **Primary NOAM** "**Active"** server (as identified and recorded in **Step 5** of this procedure) using in **Appendix E** (Backout of a Single Server) • In **Step 5** of this procedure, check-off ☒ the associated **check box** as the backout is completed for the backed out **Primary NOAM "Active"** server.
14. ☐	Allow system to auto-clear temporary alarm states. **NOTE: *Event ID 10008*** *(Provisioning Manually Disabled) will remain present at this time but can be safely ignored.*	• Wait up to **15 minutes** for Alarms associated with server backout to **auto-clear** before continuing to **Section 9.4**.
15. ☐	**Primary NOAM VIP:** Re-Enable Provisioning **Remote Import** *(if applicable)*.	• If the value for the **"Remote Import Enabled"** checkbox recorded in **Procedure 9, Step 9** was **CHECKED**, then proceed with **Step 16** of this procedure. • If the value for the **"Remote Import Enabled"** checkbox recorded in **Procedure 9, Step 9** was **NOT CHECKED**, then **SKIP** to **Step 19** of this procedure.
16. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ EAGLE XG Database** **→ Configuration** **→ PDBI** **→ *Options*** …as shown on the right.	

Procedure 10: Backout of the Primary NOAM NE

Step	Procedure	Result
17. ☐	**Primary NOAM VIP:** Locate the **"Remote Import Enabled"** checkbox and make sure that it is checked *(**ADD** the check mark if necessary)*.	
18. ☐	**Primary NOAM VIP:** If the **Check mark** was **ADDED** to the **"Remote Import Enabled"** checkbox in the previous step, then execute the following: **1)** Click the **"Apply"** dialogue box in the top left of the right panel. **2)** Verify that a **"Success!"** response is received in the banner.	 
19. ☐	**Primary NOAM VIP:** Select… **Main Menu** → **Status & Manage** → ***Database*** …as shown on the right.	

Procedure 10: Backout of the Primary NOAM NE

Step	Procedure	Result
20. ☐	**Primary NOAM VIP:** **1)** Click the **"Enable Provisioning"** dialogue button at the bottom of the right panel. **2)** Click the **"OK"** button on the confirmation pop-up box.	 
21. ☐	**Primary NOAM VIP:** Verify that the text on the dialogue button at the bottom of the right panel changes to state **"Disable Provisioning".**	
THIS PROCEDURE HAS BEEN COMPLETED		

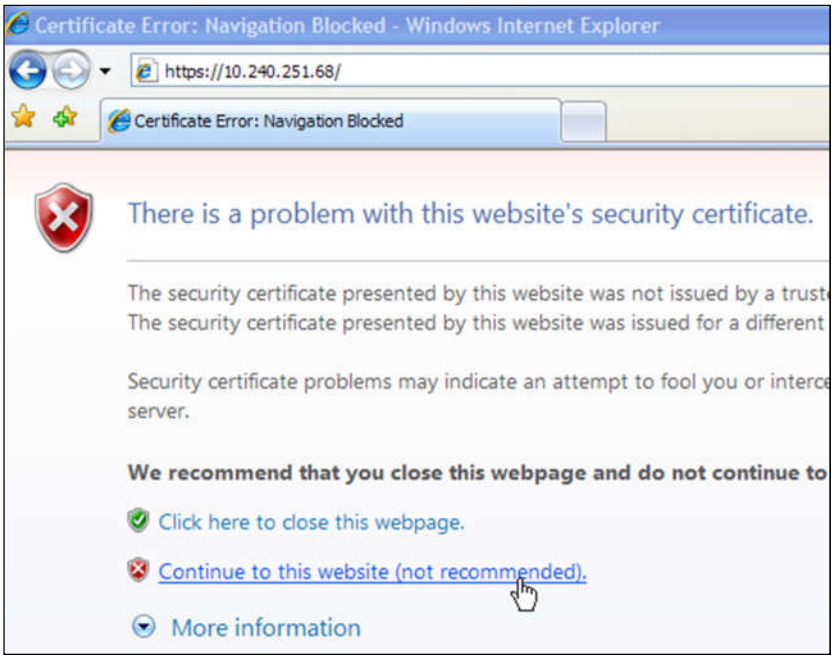
9.4 Perform Health Check *(Post NOAM Backout)*

This procedure is used to determine the health and status of the HLR Router network and servers.

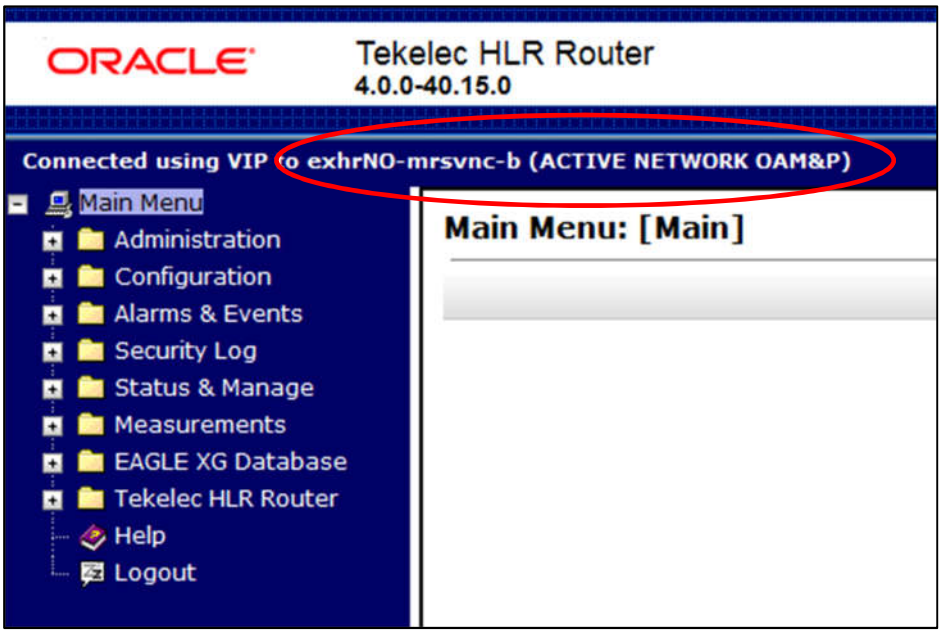
☐ Execute HLR Router Health Check procedures as specified in **Appendix B.**

APPENDIX A. ACCESSING THE OAM GUI USING THE VIP (NOAM / SOAM)

Appendix A: Accessing the OAM GUI using the VIP (NOAM / SOAM)

Step	Procedure	Result
1. ☐	**OAM VIP (GUI):** **1)** Launch the approved Web browser **Internet Explorer 8.0, 9.0** or **10.0** and connect to the XMI Virtual IP Address (VIP) assigned to **OAM site** (Primary HLRR site or SOAM site) - see **Table 4** **2)** If a certificate error is received, click on the link which states… *"Continue to this website (not recommended)."*	
2. ☐	**OAM VIP (GUI):** The user should be presented a login screen similar to the one shown on the right. Login to the GUI using the default user and password.	

Appendix A: Accessing the OAM GUI using the VIP (NOAM / SOAM)

Step	Procedure	Result
3. ☐	**OAM VIP (GUI):** The user should be presented the Main Menu as shown on the right. Verify that the message shown across the top of the right panel indicates that the browser is using the **"VIP"** connected to the **Active** OAM server.	 **NOTE:** The message may show connection to either a **"NETWORK OAM&P"** or a **"SYSTEM OAM"** depending on the selected NE.
THIS PROCEDURE HAS BEEN COMPLETED		

APPENDIX B. HEALTH CHECK PROCEDURES

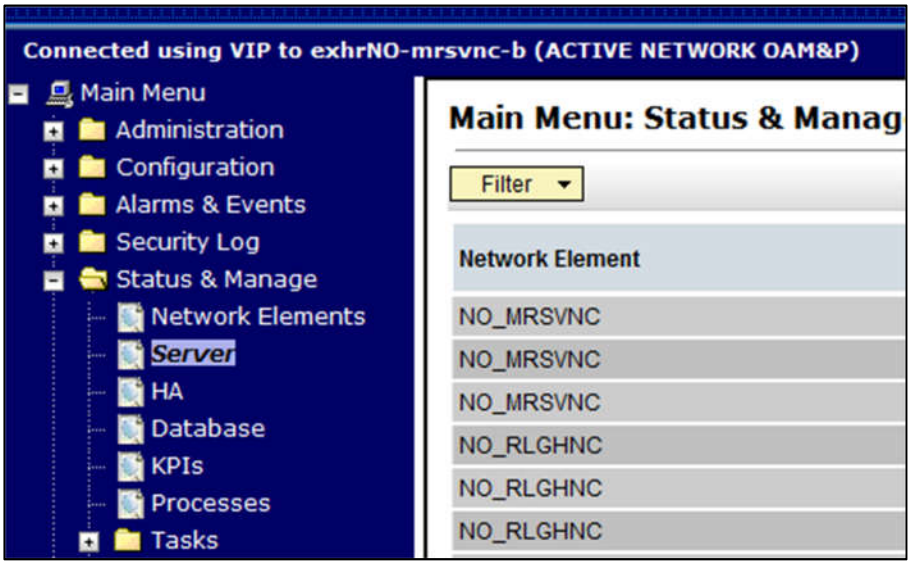
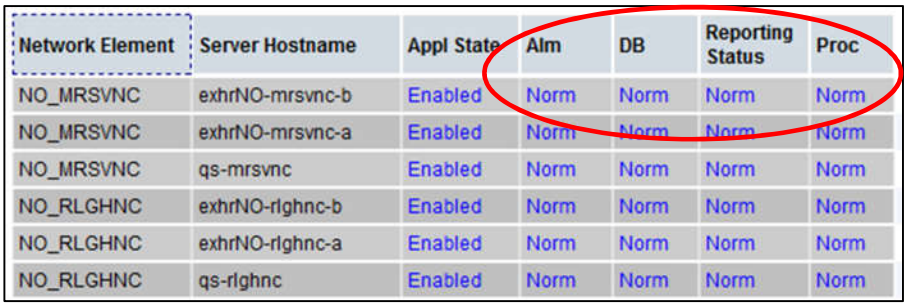
This procedure is part of Software Upgrade Preparation and is used to determine the health and status of the HLR Router network and servers.

Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number.

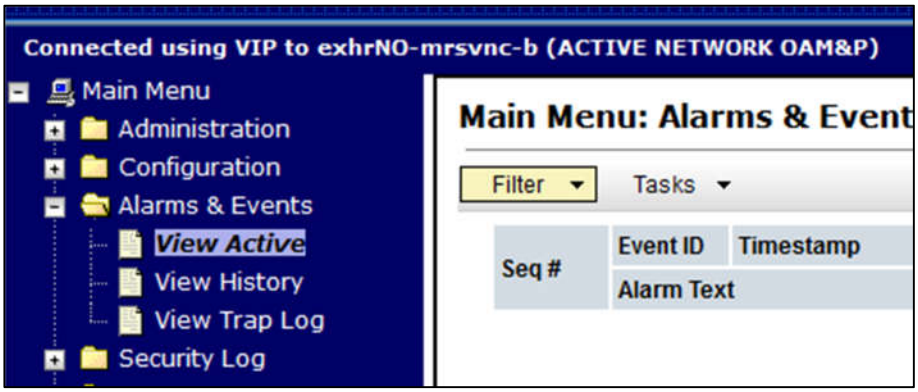
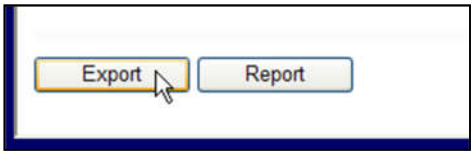
SHOULD ANY STEP IN THIS PROCEDURE FAIL, STOP AND CONTACT "MY ORACLE SUPPORT" (MOS) FOR ASSISTANCE BEFORE CONTINUING!

Refer to **Appendix J** - *Accessing My Oracle Support (MOS),* for more information on contacting Oracle Customer Service.

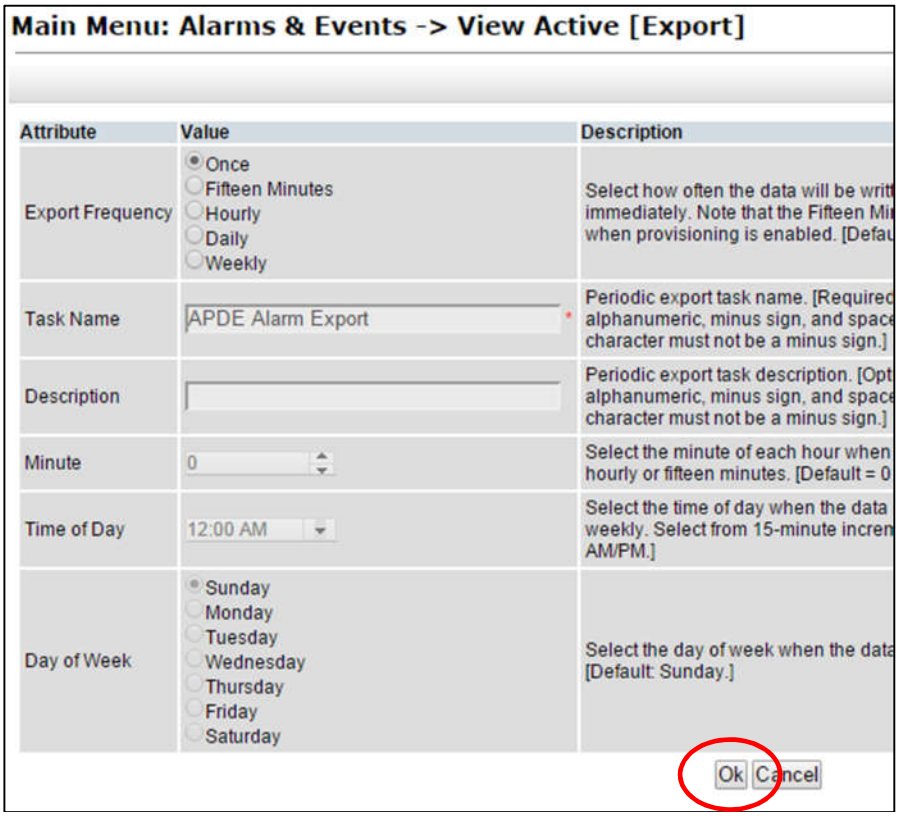
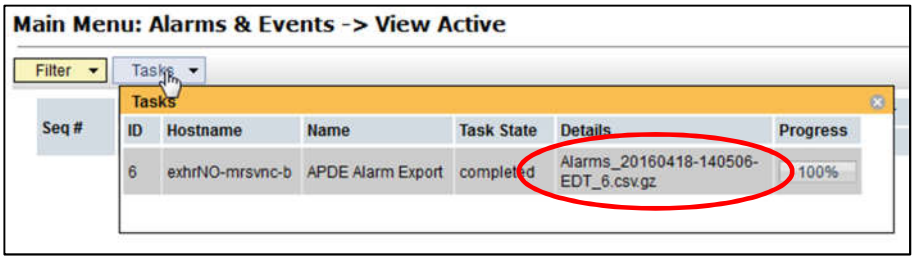
Appendix B: Health Check Procedures

Step	Procedure	Result
1. ☐	Using the VIP address, access the Primary HLRR **NOAM** GUI.	➢ Using the VIP address, access the **Primary** HLRR **NOAM GUI** as described in **Appendix A**
2. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Status & Manage** **→ Server** …as shown on the right.	
3. ☐	**Primary NOAM VIP (GUI):** Verify that all server statuses show **"Norm"** for Alarm (Alm), Database (DB), Reporting Status, and Processes (Proc) as shown on the right. If any other server statuses are present, they will appear in a colored box as shown on the right. **NOTE:** Other server states include **Err, Warn, Man** and **Unk**.	 **NOTE:** *Post-Upgrade, upgraded servers will have an **"Alm"** status of **"Err"** due to the following expected alarm.* • ***Event ID (s): 32532** (Server Upgrade Pending Accept/Reject)* *This alarm will remain present until the Upgrade is accepted and may be ignored at this time.*

Appendix B: Health Check Procedures

Step	Procedure	Result
4. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Alarm & Events** **→ View Active** …as shown on the right.	
5. ☐	**Primary NOAM VIP (GUI):** View Alarm Status in the right panel.	When viewing **Pre-Upgrade** Status: If any Alarms are present, STOP and contact "My Oracle Support" (MOS) for assistance before attempting to continue. Refer to **Appendix J** - *Accessing My Oracle Support (MOS)*, for more information on contacting Oracle Customer Service. When viewing **Post-Upgrade** Status: Active NO server may have the following expected alarms: Alarm ID = **10075** (Application processes have been manually stopped) Alarm ID = **10008** (Provisioning Manually Disabled) Servers that still have replication disabled will have the following expected alarm: Alarm ID = **31113** (Replication Manually Disabled) You may also see alarms: Alarm ID = **10010** (Stateful database not yet synchronized with mate database) Alarm ID = **32532** (Server Upgrade Pending Accept/Reject)
6. ☐	**Primary NOAM VIP (GUI):** Select the **"Export"** dialogue button from the bottom left corner of the screen.	

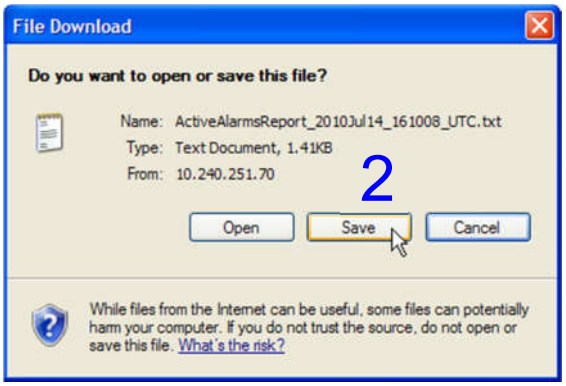
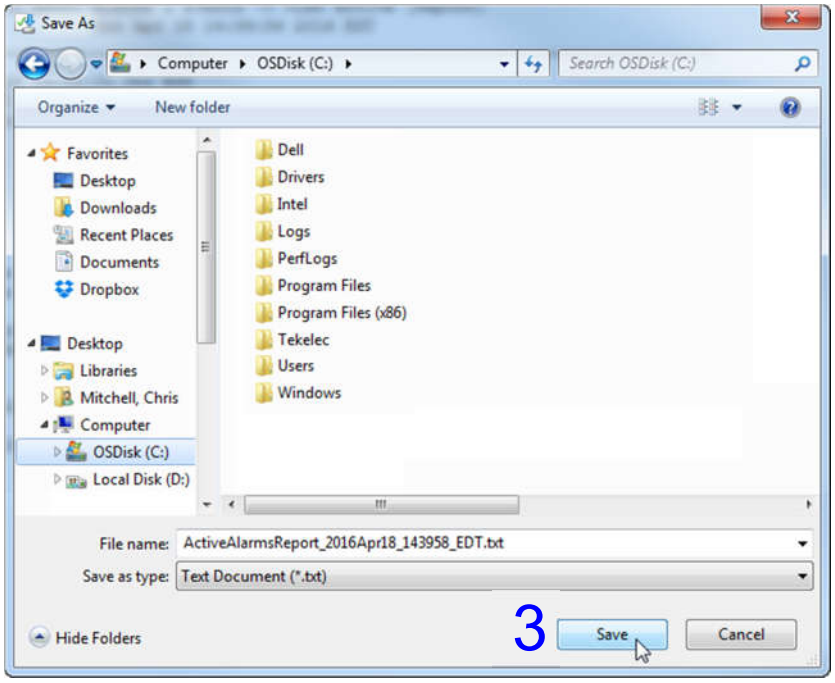
Appendix B: Health Check Procedures

Step	Procedure	Result
7. ☐	**Primary NOAM VIP (GUI):** Click the **"Ok"** button at the bottom of the screen.	
8. ☐	**Primary NOAM VIP (GUI):** The name of the exported Alarms CSV file will appear in the **"Tasks"** tab in the banner at the top of the right panel.	

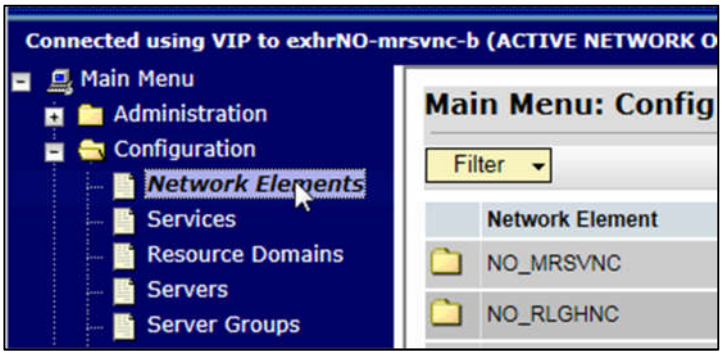
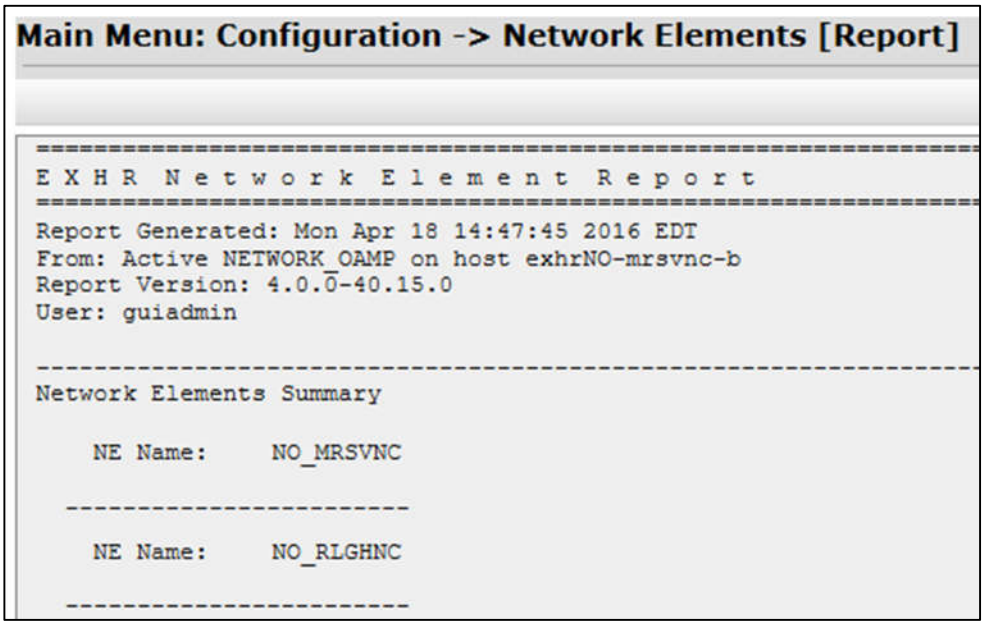
Appendix B: Health Check Procedures

Step	Procedure	Result
9. ☐	**Primary NOAM VIP (GUI):** Record the filename of Alarms CSV file generated in the space provided to the right. **NOTE**: *Copies of this page may be made as needed for additional **SOAM NE** Maintenance Windows.*	Example: Alarms<yyyymmdd>_<hhmmss>.csv **Primary NOAM Alarm Status:** ➢ ***Pre ISO Administration:*** Alarms _____ - _____ .csv.gz ➢ ***Post ISO Administration:*** Alarms _____ - _____ .csv.gz ➢ ***Pre Primary NOAM Upgrade (MW1):*** Alarms _____ - _____ .csv.gz ➢ ***Post DR NOAM Upgrade (MW1):*** Alarms _____ - _____ .csv.gz ➢ ***Pre SOAM Upgrade (MW2):*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Upgrade (MW2):*** Alarms _____ - _____ .csv.gz ➢ ***Pre SOAM Upgrade (MW3):*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Upgrade (MW3):*** Alarms _____ - _____ .csv.gz ➢ ***Pre SOAM Upgrade (MW4):*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Upgrade (MW4):*** Alarms _____ - _____ .csv.gz ➢ ***Pre SOAM Upgrade (MW5):*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Upgrade (MW5):*** Alarms _____ - _____ .csv.gz ➢ ***Pre SOAM Upgrade (MW6):*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Upgrade (MW6):*** Alarms _____ - _____ .csv.gz
10. ☐	**Primary NOAM VIP (GUI):** Select the **"Report"** dialogue button from the bottom left corner of the screen.	

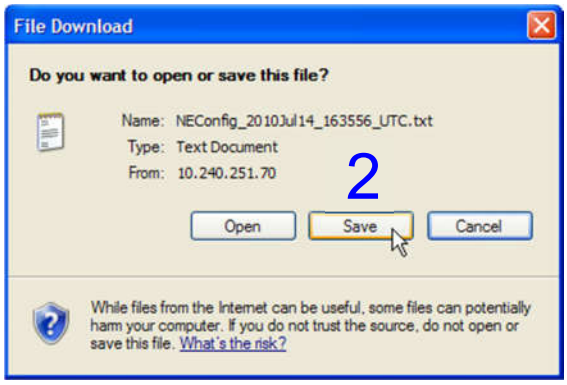
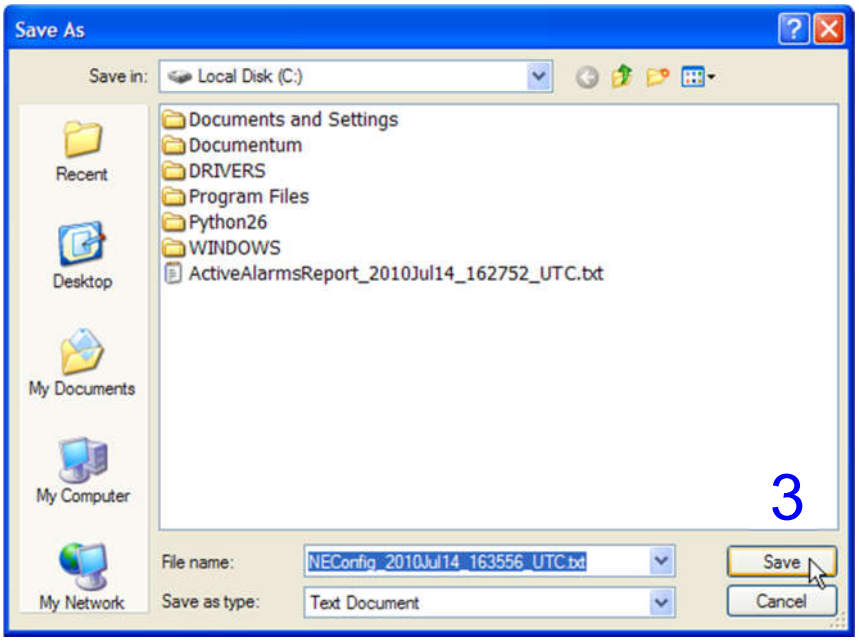
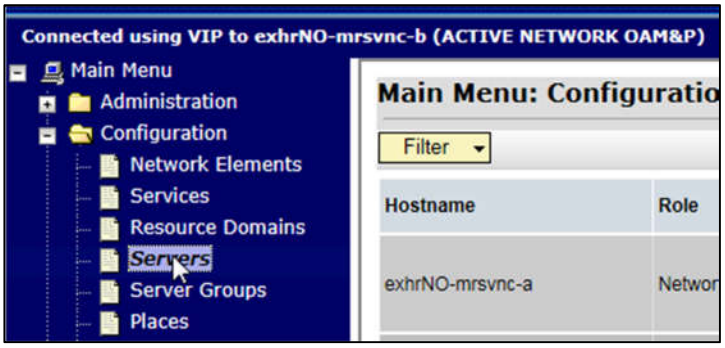
Appendix B: Health Check Procedures

Step	Procedure	Result
11. ☐	**Primary NOAM VIP (GUI):** An **Active "Alarms & Events" Report** will be generated and displayed in the right panel.	**Main Menu: Alarms & Events -> View Active [Report]** Main Menu: Alarms & Events -> View Active [Report] Mon Apr 18 14:12:10 2016 EDT TIMESTAMP: 2016-04-18 14:12:02.344 EDT NETWORK_ELEMENT: NO_MRSVNC SERVER: exhrNO-mrsvnc-b SEQ_NUM: 2435 EVENT_NUMBER: 14101 SEVERITY: MAJOR PRODUCT: EXHR PROCESS: pdba TYPE: PDBI INSTANCE: NAME: No Remote Connections DESCR: No remote provisioning clients are connected. ERR_INFO:
12. ☐	**Primary NOAM VIP (GUI):** **1)** Select the **"Save"** dialogue button from the bottom/middle of the right panel. **2)** Click the **"Save"** dialogue button on the File Download pop-up box. **3)** Select a directory on the local disk drive to store the Active "Alarms & Events" Report file and click the **"Save"** dialogue button.	  

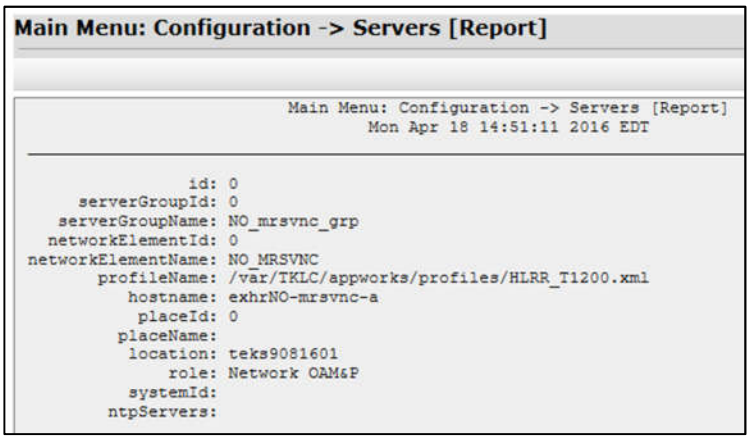
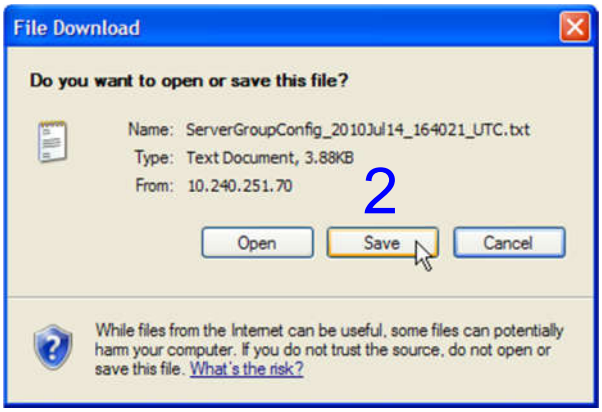
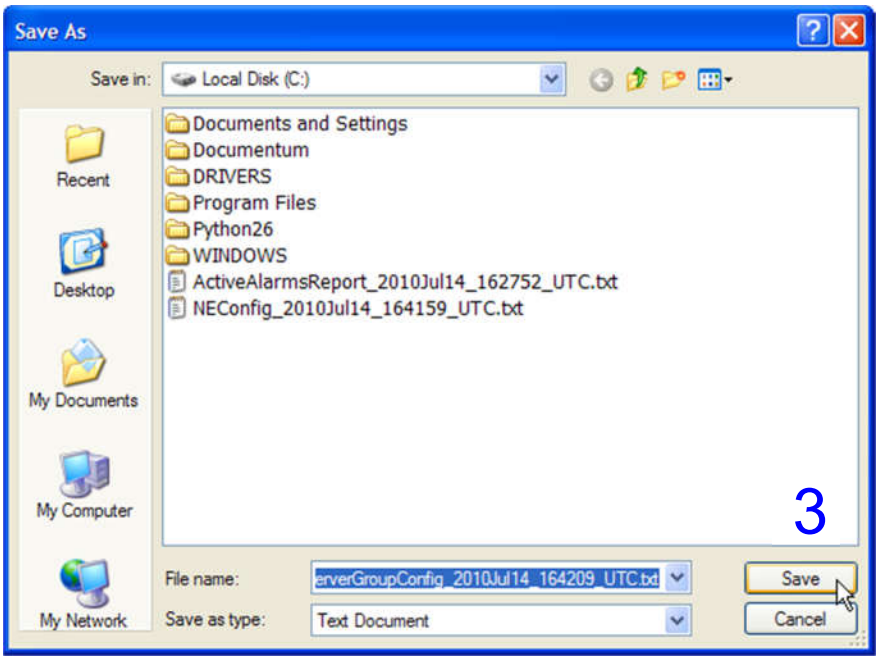
Appendix B: Health Check Procedures

Step	Procedure	Result
13. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Configuration** **→ Network Elements** …as shown on the right.	
14. ☐	**Primary NOAM VIP (GUI):** Select the **"Report"** dialogue button from the bottom left corner of the screen.	
15. ☐	**Primary NOAM VIP (GUI):** A **"Network Element Report"** will be generated and displayed in the right panel.	

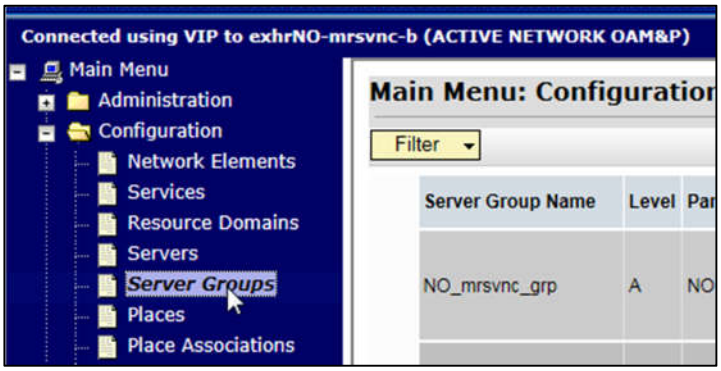
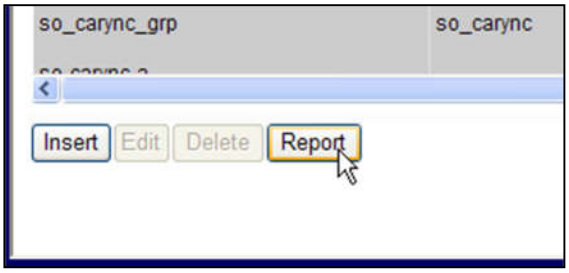
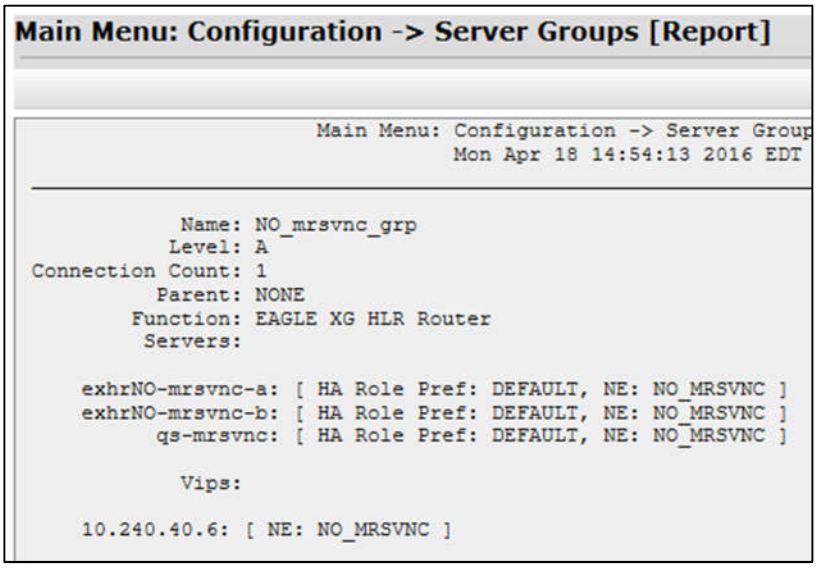
Appendix B: Health Check Procedures

Step	Procedure	Result
16. ☐	**Primary NOAM VIP (GUI):** **1)** Select the **"Save"** dialogue button from the bottom/middle of the right panel. **2)** Click the **"Save"** dialogue button on the File Download pop-up box. **3)** Select a directory on the local disk drive to store the "Network Elements Report" file and click the **"Save"** dialogue button.	  
17. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Configuration** **→ Servers** …as shown on the right.	
18. ☐	**Primary NOAM VIP (GUI):** Select the **"Report"** dialogue button from the bottom left corner of the screen.	

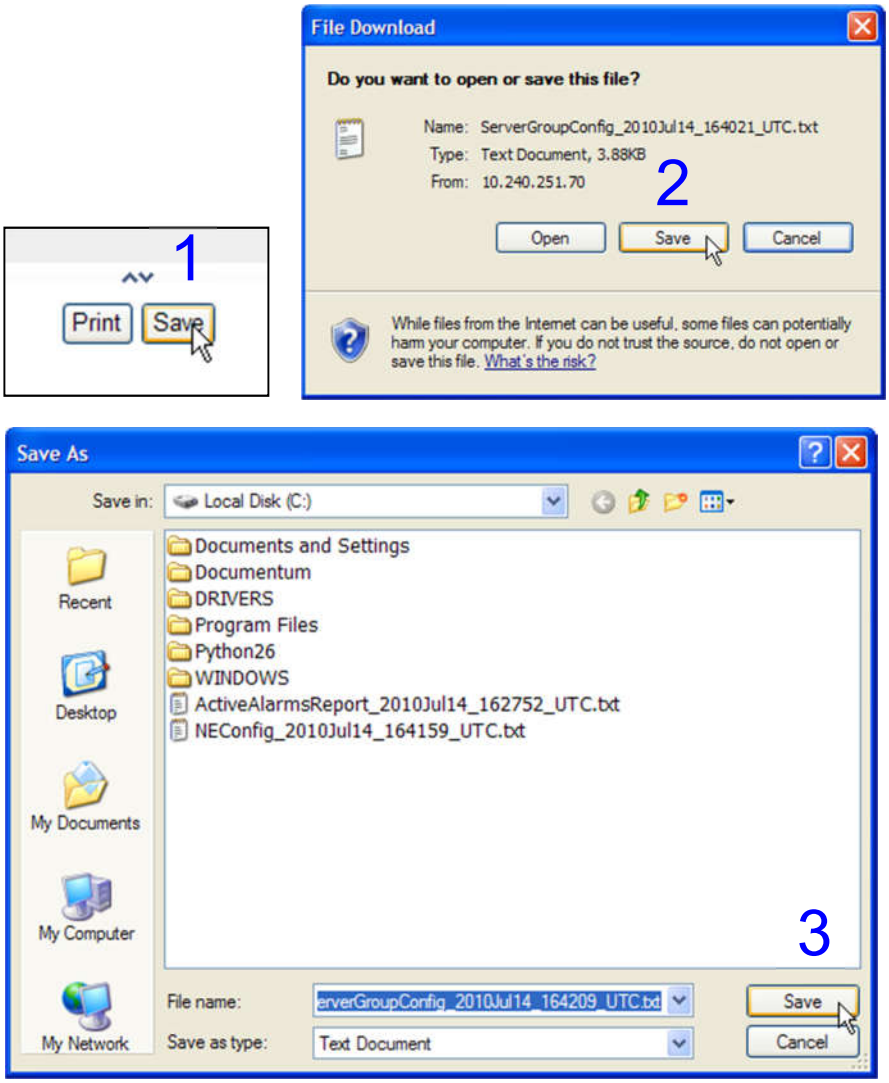
Appendix B: Health Check Procedures

Step	Procedure	Result
19. ☐	**Primary NOAM VIP (GUI):** A **"Server Report"** will be generated and displayed in the right panel.	
20. ☐	**Primary NOAM VIP (GUI):** **1)** Select the **"Save"** dialogue button from the bottom/middle of the right panel. **2)** Click the **"Save"** dialogue button on the File Download pop-up box. **3)** Select a directory on the local disk drive to store the "Server Group Report" file and click the **"Save"** dialogue button.	  

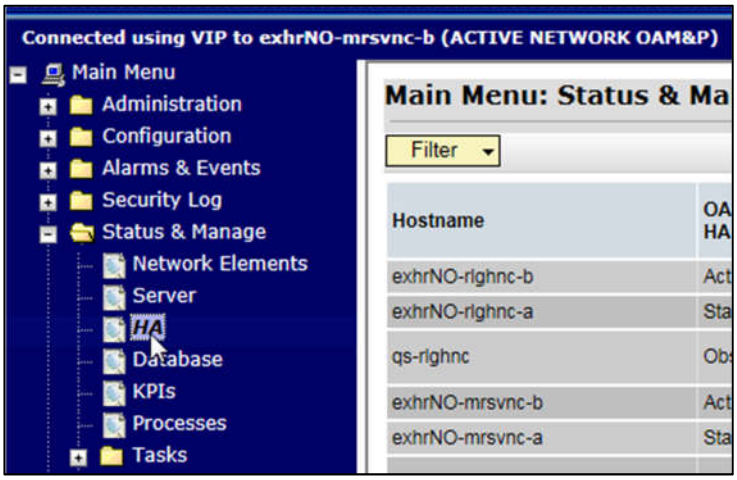
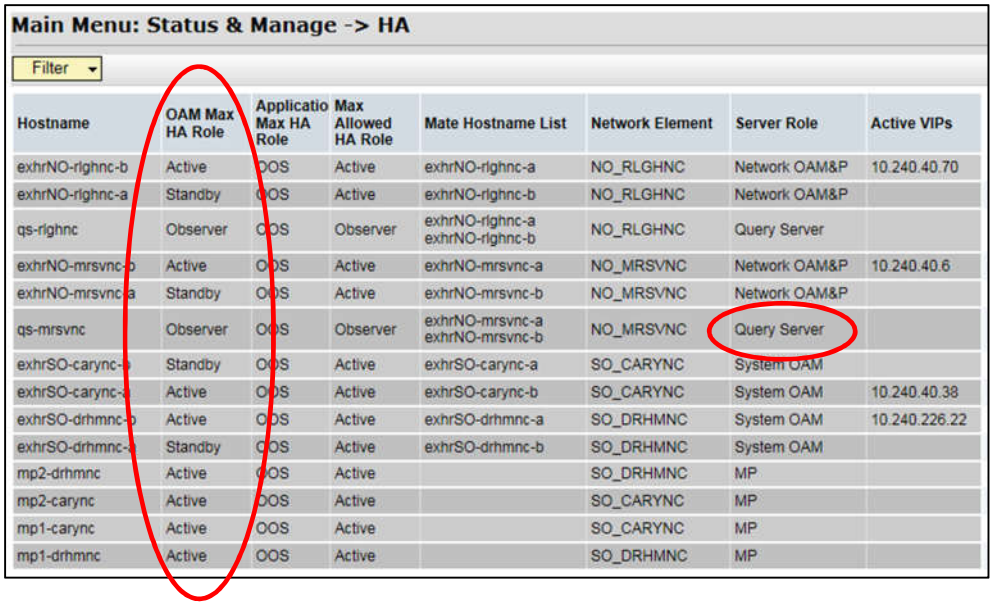
Appendix B: Health Check Procedures

Step	Procedure	Result
21. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Configuration** **→ Server Groups** …as shown on the right.	
22. ☐	**Primary NOAM VIP (GUI):** Select the **"Report"** dialogue button from the bottom left corner of the screen.	
23. ☐	**Primary NOAM VIP (GUI):** A **"Server Group Report"** will be generated and displayed in the right panel.	

Appendix B: Health Check Procedures

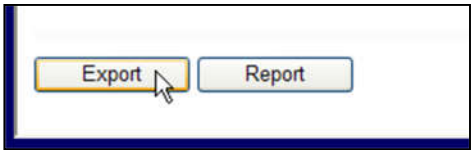
Step	Procedure	Result
24. ☐	**Primary NOAM VIP (GUI):** **1)** Select the **"Save"** dialogue button from the bottom/middle of the right panel. **2)** Click the **"Save"** dialogue button on the File Download pop-up box. **3)** Select a directory on the local disk drive to store the "Server Group Report" file and click the **"Save"** dialogue button.	
25. ☐	Provide the saved files to "My Oracle Support" (MOS) for Health Check Analysis.	• If executing this procedure as a pre or post Upgrade Health Check (HC1/HC2/HC3), provide the following saved files to **"My Oracle Support" (MOS)** for Health Check Analysis: o **Active "Alarms & Events" Report** [Appendix B, Step 12] o **Network Elements Report** [Appendix B, Step 16] o **Server Report** [Appendix B, Step 20] o **Server Group Report** [Appendix B, Step 24]

Appendix B: Health Check Procedures

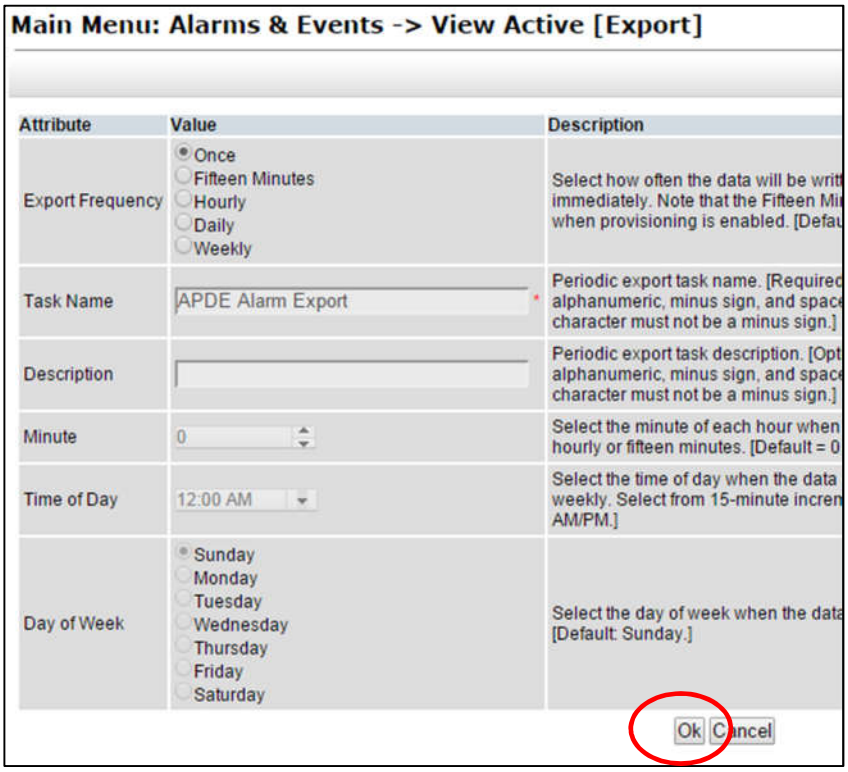
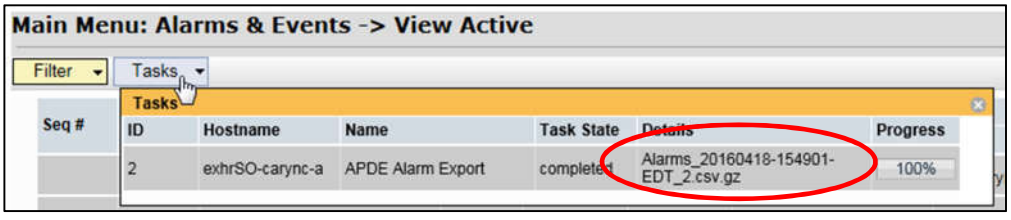
Step	Procedure	Result
26. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Status & Manage** **→ HA** …as shown on the right.	
27. ☐	**Primary NOAM VIP (GUI):** **1)** Verify that the **"OAM Max HA Role"** for all servers shows either **"Active"** or **"Standby"** as shown to the right. **NOTE:** An **"HA Status"** of **"Observer"** is allowed when Server Role is **"Query Server"**.	
28. ☐	**Primary NOAM VIP (GUI):** Verify the **"OAM HA Max Role"** for all remaining servers on the **[Main Menu: Status & Manage → HA]** screen.	• Scroll thru each page of the **[Main Menu: Status & Manage → HA]** screen until the **"OAM HA Role"** for has been verified for all servers in the topology.

- If executing this **Health Check** procedure during **NOAM NE** upgrade, then **SKIP** the remainder of this procedure and return to the referring Section of the document.
- If executing this Health Check procedure during **SOAM NE** upgrade, then **CONTINUE** with **Step 29** of this procedure.

Appendix B: Health Check Procedures

Step	Procedure	Result
29. ☐	Using the VIP address, access the HLRR **SOAM** GUI.	Using the VIP address, access the HLRR **SOAM GUI** as described in **Appendix A**
30. ☐	**SOAM VIP (GUI):** Select… **Main Menu** **→ Alarm & Events** **→ View Active** …as shown on the right.	
31. ☐	**SOAM VIP (GUI):** View Alarm Status in the right panel.	When viewing **Pre-Upgrade** Status: Since HLR Router alarms at the SOAM reflect SS7 activity, it is common for alarms to be present during normal operation. Therefore, this Health Check will only capture current alarms thru the "Export" function (pre-upgrade) so that they may be compared to the post-upgrade alarm activity if needed. If any Alarms are unexpected and require assistance, then STOP and contact "My Oracle Support" (MOS) before attempting to continue. Refer to **Appendix J** - *Accessing My Oracle Support (MOS)*, for more information on contacting Oracle Customer Service. When viewing **Post-Upgrade** Status: Active NO server may have the following expected alarms: Alarm ID = **10075** (Application processes have been manually stopped) Alarm ID = **10008** (Provisioning Manually Disabled) Servers that still have replication disabled will have the following expected alarm: Alarm ID = **31113** (Replication Manually Disabled) You may also see alarms: Alarm ID = **10010** (Stateful database not yet synchronized with mate database) Alarm ID = **32532** (Server Upgrade Pending Accept/Reject)
32. ☐	**SOAM VIP (GUI):** Select the **"Export"** dialogue button from the bottom left corner of the screen.	

Appendix B: Health Check Procedures

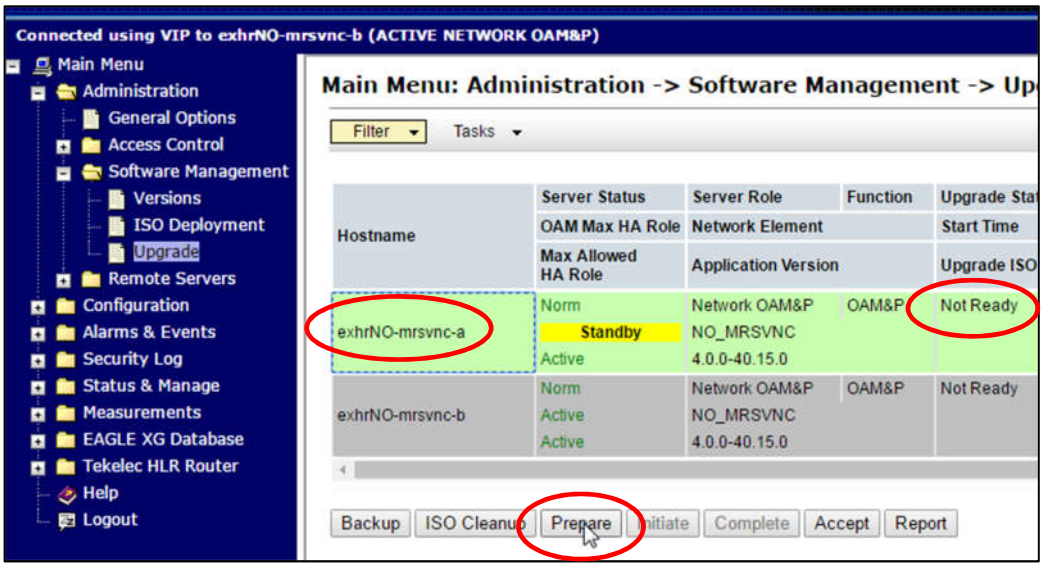
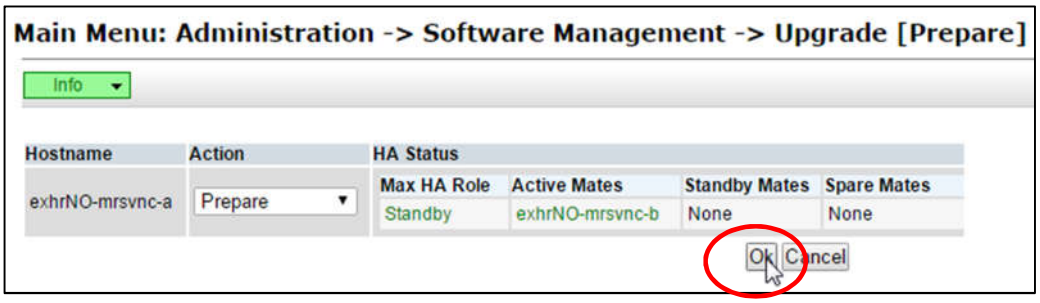
Step	Procedure	Result
33. ☐	**SOAM VIP (GUI):** Leave all fields at the default value and click the **"Ok"** button at the bottom of the screen.	
34. ☐	**SOAM VIP (GUI):** The name of the exported Alarms CSV file will appear in the **"Tasks"** tab in the banner at the top of the right panel.	

Appendix B: Health Check Procedures

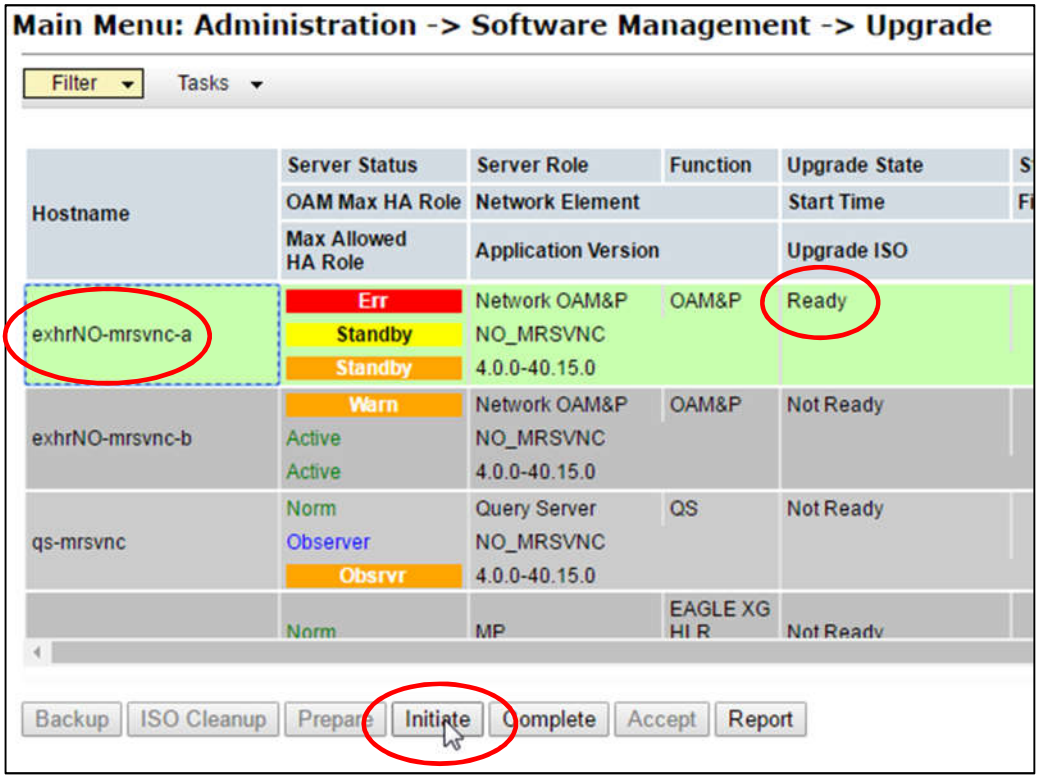
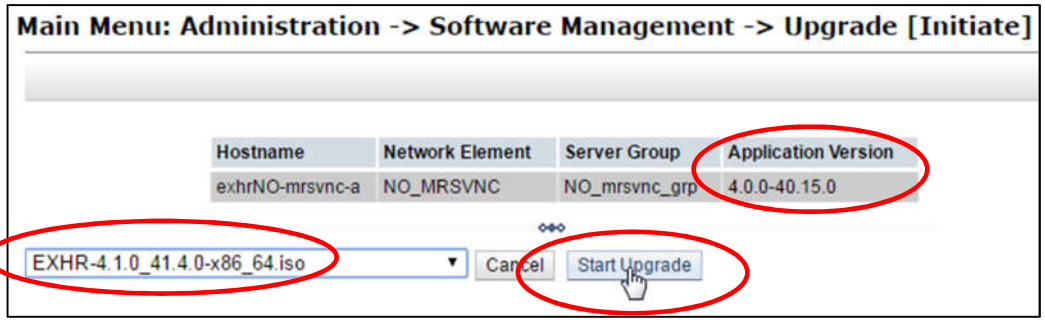
Step	Procedure	Result
35. ☐	**SOAM VIP (GUI):** Record the filename of Alarms CSV file generated in the space provided to the right. **NOTE**: *This procedure assumes that no more than (4) SOAM NE(s) will be upgraded in a single maintenance window.* *Copies of this page may be made as needed if additional **SOAM NE(s)** are to be upgraded in the same Maintenance Windows.*	Example: Alarms<yyyymmdd>_<hhmmss>.csv **SOAM Alarm Status:** **SOAM Site 1** *(Name)* _____ ➢ ***Pre SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz **SOAM Site 2** *(Name)* _____ ➢ ***Pre SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz **SOAM Site 3** *(Name)* _____ ➢ ***Pre SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz **SOAM Site 4** *(Name)* _____ ➢ ***Pre SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz ➢ ***Post SOAM Site 1 Upgrade:*** Alarms _____ - _____ .csv.gz
36. ☐	**Export** the **SOAM alarms** for each **SOAM NE** to be upgraded in this Maintenance Window.	• Repeat **Steps 29 - 35** of this procedure for each **SOAM NE** to be upgraded in this Maintenance Window.
THIS PROCEDURE HAS BEEN COMPLETED		

APPENDIX C. UPGRADE SERVER ON HLRR 4.0

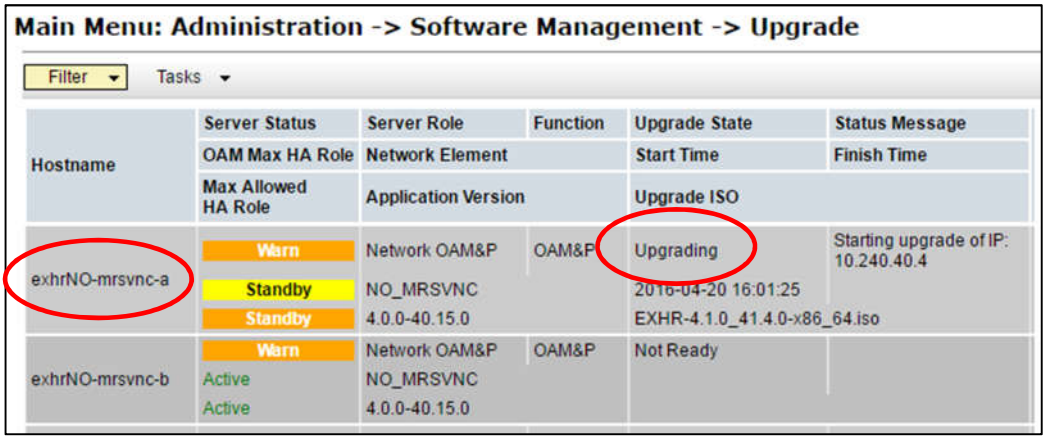
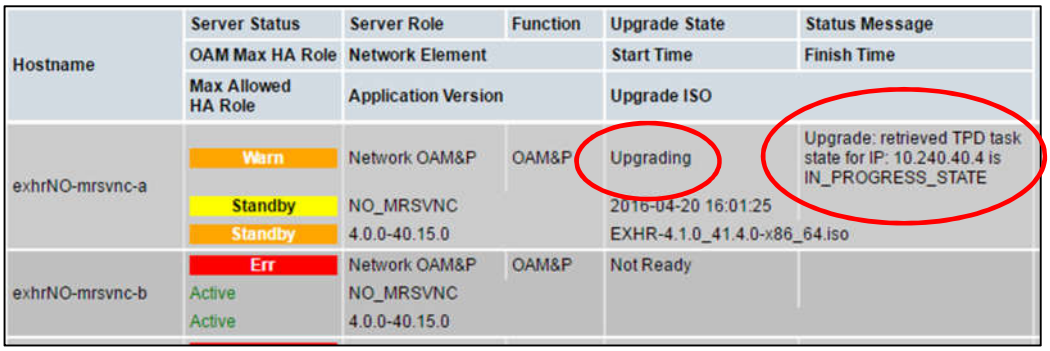
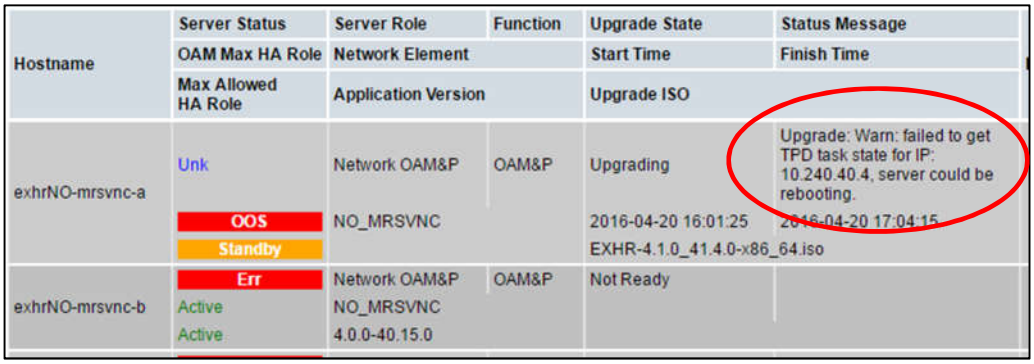
Appendix C: Upgrade Server on HLRR 4.0

Step	Procedure	Result
1. ☐	***HLRR 4.0 only*** Using the VIP address, access the **Primary HLRR NOAM GUI**.	• Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
2. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Using the vertical scroll bar in the right panel, scroll to the row containing the **hostname** of the server to be upgraded. **3)** Verify that the **Upgrade State** shows **"Not Ready"**. **4)** Click the **"Prepare"** dialogue button located in the bottom left of the right panel.	
3. ☐	**Primary NOAM VIP:** The user should be presented with the **Upgrade [Make Ready]** screen. Click on **"Ok"** dialogue button.	

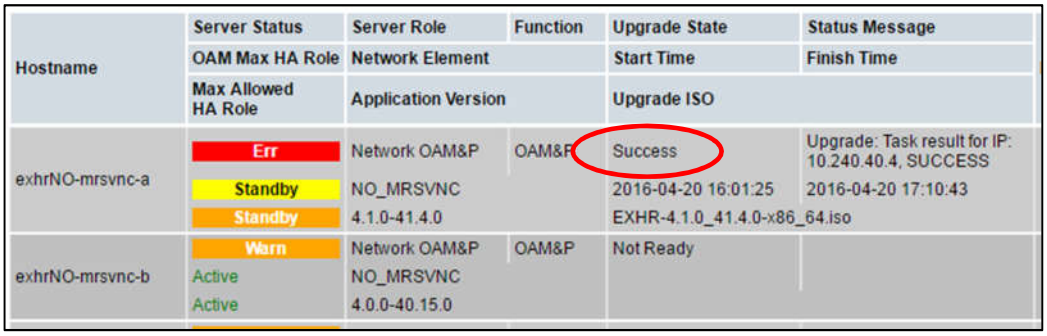
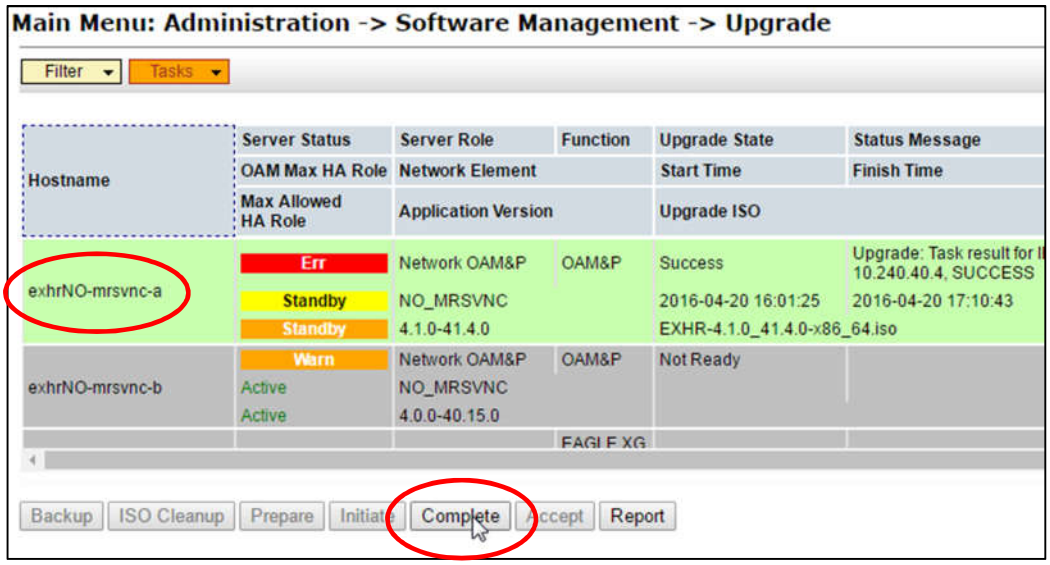
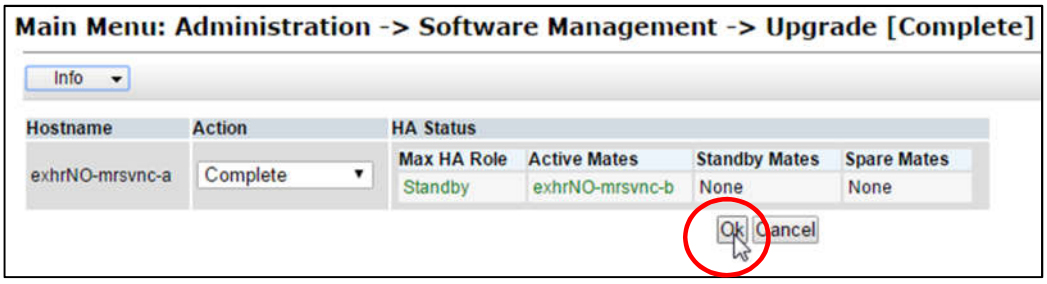
Appendix C: Upgrade Server on HLRR 4.0

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Using the vertical scroll bar in the right panel, scroll to the row containing the **hostname** of the server to be upgraded. **3)** Verify that the **Upgrade State** shows **"Ready"**. **NOTE:** If the **Upgrade State** fails to show **"Ready"**, the user may need to repeat above sub-steps **3)** Click the **"Initiate"** dialogue button	
5. ☐	**Primary NOAM VIP:** 1) Verify that the **Application Version** shows the **<source_release>** 2) Using the pull-down menu, select the **<target_release>** 3) Click the **"Start Upgrade"** dialogue button	

Appendix C: Upgrade Server on HLRR 4.0

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** The user is returned to the… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** …screen as shown on the right. **1)** Scroll to the row containing the **hostname** of the server to be upgraded. **2)** Verify that the **Upgrade State** shows **"Upgrading"**.	 **NOTE:** *As a result of the server undergoing upgrade, several alarms may appear and remain present until the upgrade has been completed. These alarms include but are not limited to* ***Event ID(s): 10073, 31101, 31102, 31106, 31107, 31114 and 31283****.*
7. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** The **Upgrade State** field should be **Upgrading** **3)** The **Status Message** field should contain status **"IN_PROGRESS_STATE".**	
8. ☐	**Primary NOAM VIP:** At the completion of the upgrade, the server will initiate a **post-upgrade reboot**. During this reboot, the **Status Message** field will display the following expected message: ***"Warn: failed to get TPD task state for IP: <server_IP>, server could be rebooting."***	

Appendix C: Upgrade Server on HLRR 4.0

Step	Procedure	Result
9. ☐	**Primary HLRR 4.0 Site VIP:** After the post-upgrade reboot has been completed, the **Upgrade State** field should show a value of **"Success".**	
10. ☐	**Primary NOAM VIP:** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Select the row containing the **hostname** of the upgraded server **3)** Click the **"Complete"** dialogue button	
11. ☐	**Primary NOAM VIP:** The user presented with the **Upgrade [Complete]** screen. Click an **"Ok"** dialogue button.	

Appendix C: Upgrade Server on HLRR 4.0

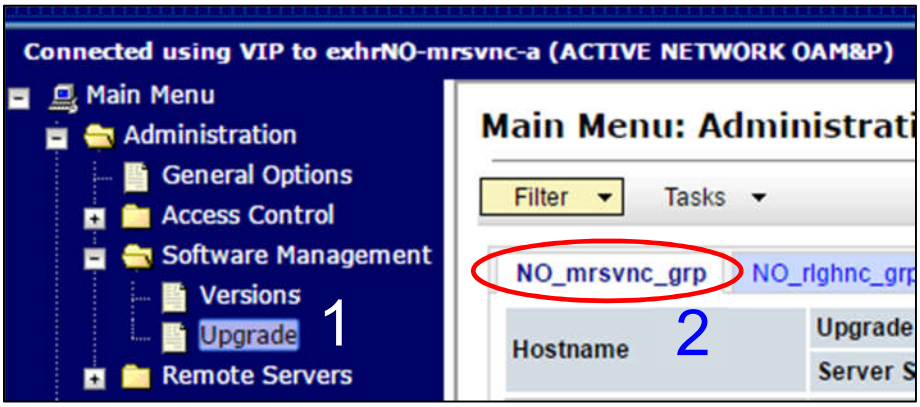
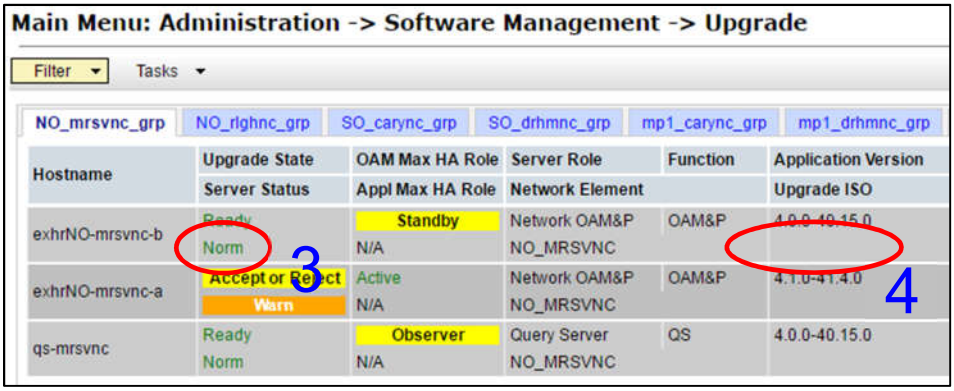
Step	Procedure	Result
12. ☐	**Primary NOAM VIP:** The user presented with the **Upgrade** screen. **1)** Verify that the **Application Version** now shows the **"target"** release. **2)** Verify that the **Upgrade State** now shows **"Not Ready"**.	See table below

Hostname	Server Status	Server Role	Function	Upgrade State
	OAM Max HA Role	Network Element		Start Time
	Max Allowed HA Role	Application Version		Upgrade ISO
exhrNO-mrsvnc-a	Err	Network OAM&P	OAM&P	Not Ready
	Standby	NO_MRSVNC		
	Active	4.1.0-41.4.0		
exhrNO-mrsvnc-b	Norm	Network OAM&P	OAM&P	Not Ready
	Active	NO_MRSVNC		
	Active	4.0.0-40.15.0		

THIS PROCEDURE HAS BEEN COMPLETED

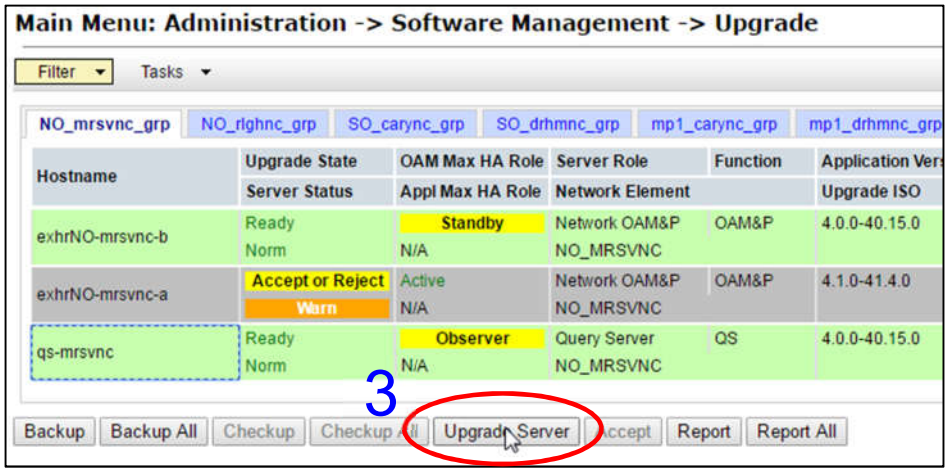
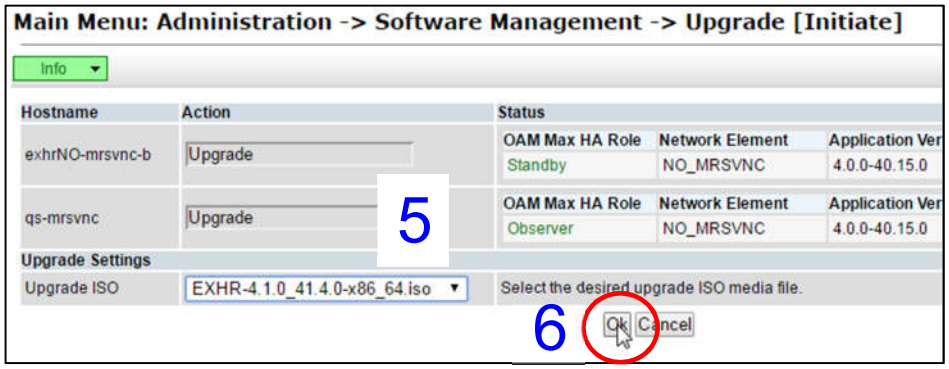
APPENDIX D. SERVER UPGRADE ADMINISTRATION ON HLRR 4.1

Appendix D: Server Upgrade Administration on HLRR 4.1

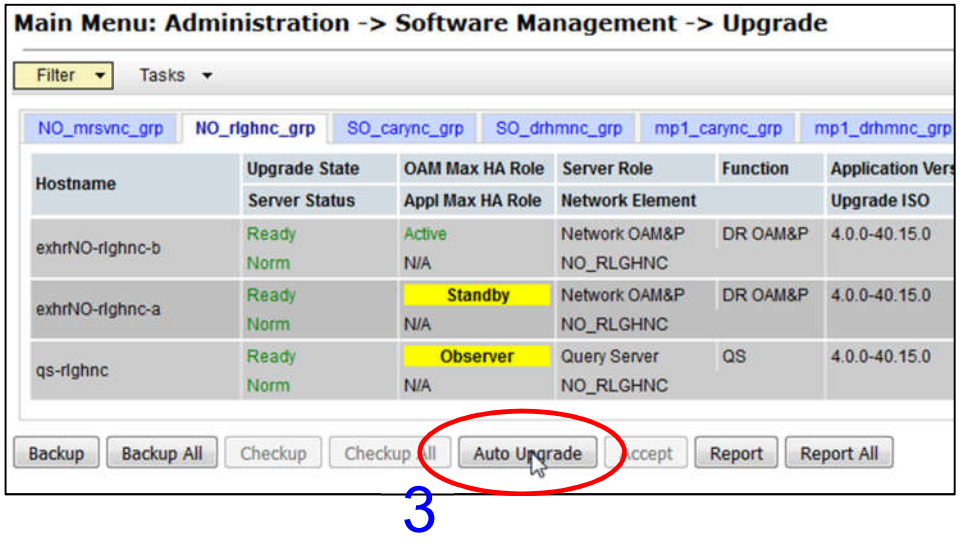
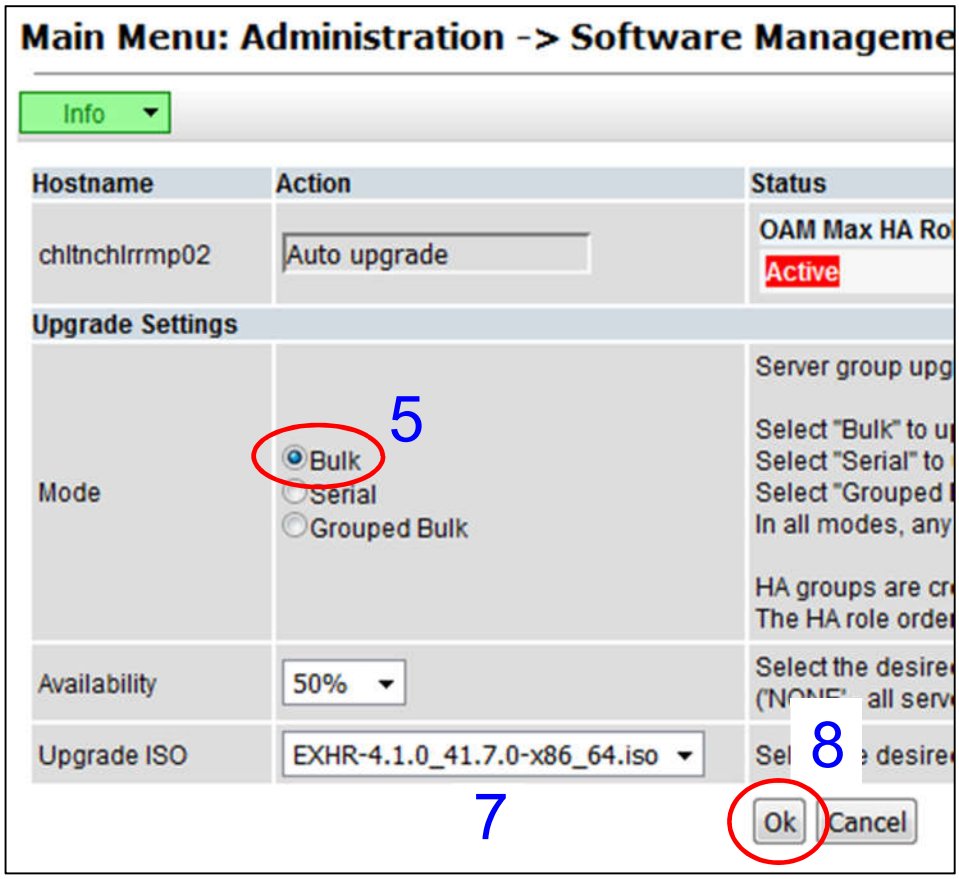
Step	Procedure	Result
1. ☐	Using the VIP address, access **the Primary HLRR NOAM GUI**.	• Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
2. ☐	**Primary NOAM VIP (GUI):** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Select the **tab** associated with the **Server Group** containing the server(s) to be upgraded. **3)** Verify that the **"Upgrade State"** shows **"Ready"** for the server(s) to be upgraded. **4)** Verify the **Application Version** value for server(s) is the source software release version	 

- If executing **Server Group "Auto Upgrade" option**, then **SKIP** to **Step 4** of this procedure.
  - *Allowed for **DR NOAM** & **SOAM** Server Groups only!*
- If executing the **"Upgrade Server" option** *(single or multi-selected)*, then proceed to **Step 3** of this procedure.
  - *Required for **Primary NOAM** & **MP** Server Groups.*

Appendix D: Server Upgrade Administration on HLRR 4.1

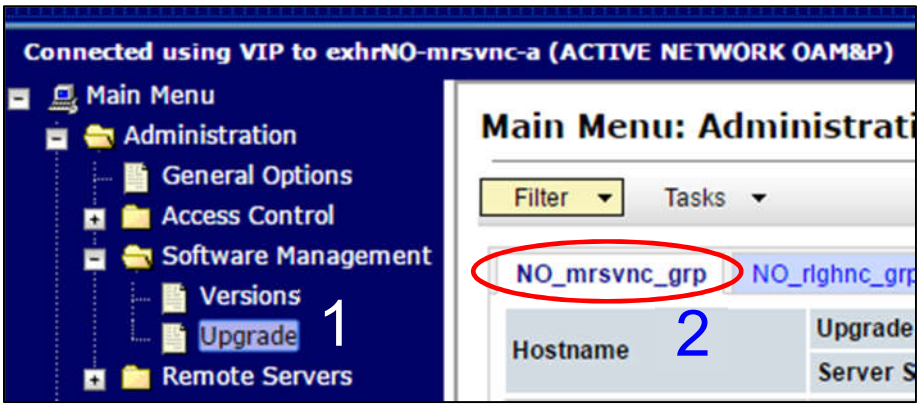
Step	Procedure	Result
3. ☐	**Primary NOAM VIP:** ***This Step: Single Server Upgrade** (or multi-selected) **only!*** **NOTE:** Always use this option when upgrading the **Primary NOAM** or **MP** Server Groups. **1)** Use cursor to **select** the server or use the **[CTRL]** key to **multi-select** individually server(s) for upgrade. **2)** Ensure the **"Upgrade Server"** dialogue button is enabled. **3)** Click the **"Upgrade Server"** dialogue button. **4)** The user should be presented with the **Upgrade [Initiate]** screen **5)** Select the **Upgrade ISO** file to be used in the server upgrade. **6)** Click the "**Ok**" dialogue button to start rthe upgrade. **7) SKIP** to **Step 5** of this procedure.	 

Appendix D: Server Upgrade Administration on HLRR 4.1

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** ***This Step: Server Group "Auto Upgrade" only!*** **!! WARNING !!** The **"Auto Upgrade"** option is valid for **DR NOAM** and **SOAM** Server Groups only! **DO NOT** use the **"Auto Upgrade"** option when upgrading the **Primary NOAM** or **MP** Server Groups. **1) DO NOT** select any individual servers using the cursor. **2)** Ensure the **"Auto Upgrade"** dialogue button is enabled. **3)** Click the **"Auto Upgrade"** dialogue button. **4)** The user should be presented with the **Upgrade [Initiate]** screen **5)** Select **"Bulk"** mode. **6)** Leave the **"Availability"** value at default (50%). **7)** Select the **Upgrade ISO** file to be used in the server upgrade. **8)** Click the "**Ok**" dialogue button to start rthe upgrade. **NOTE**: *When Auto Upgrade **"Bulk"** mode is selected, all non-Active servers will be upgraded first (e.g. Standby, Query Server, etc.).*	 

- If upgrading the **formerly "Active" Primary NOAM** server *(i.e. the **2nd NOAM** to be upgraded)*, then continue with **Step 5** of this procedure.
- For all other server upgrades, **SKIP** to **Step 10** of this procedure.

Appendix D: Server Upgrade Administration on HLRR 4.1

Step	Procedure	Result
5. ☐	**Primary NOAM VIP:** When upgrade is initiated on the **"Active" Primary NOAM** server, an **HA Switchover** will occur.	The user will be **disconnected** from the **GUI** session as the **"Active" Primary NOAM** server goes through **HA Switchover** and becomes the **"Standby"** server.
6. ☐	**Primary NOAM VIP:** If not automatically **logged out** of the **GUI**, use the **[Logout]** link in the top right of the browser to logout of the **Primary NOAM GUI**.	
7. ☐	**Primary NOAM VIP (GUI):** **Clear the browser cache.** **!! IMPORTANT !!** ***DO NOT** proceed to the next step until the **browser cache** has been **cleared**.*	JavaScript libraries, images and other objects are often modified in the upgrade. Browsers can sometimes cause GUI problems by holding on to the old objects in the built-in cache. To prevent these problems always clear the browser cache before logging into an OAM GUI which has just been upgraded: **4)** Simultaneously hold down the **[Ctrl]**, **[Shift]** and **[Delete]** keys *(most Web browsers)*. **5)** Select the appropriate object types to delete from the cache via the pop-up dialog. *(e.g. **"Temporary Internet Files", "Cache"** or **"Cached images and files"**, etc.)*. Other browsers may label these objects differently. **Clear the cached data.**
8. ☐	Once again, use the **VIP** address to access the **Primary NOAM GUI**.	• Using the **VIP** address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
9. ☐	**Primary NOAM VIP (GUI):** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Select the **tab** associated with the **Server Group** containing the server(s) to be upgraded.	

Appendix D: Server Upgrade Administration on HLRR 4.1

<table>
<tr><th>Step</th><th>Procedure</th><th>Result</th></tr>
<tr><td>10.
☐</td><td>Primary NOAM VIP:
The user should now monitor the “Upgrade State” and the “Status Message” entries for the servers being upgraded.

As Upgrade executes for each server, the user should observe the states shown to the right.

NOTE: Some states may transition faster than the screen refresh rate and appear to skip.

NOTE: During server upgrade, multiple alarms are expected and can be safely ignored. These include but are not limited to the following:

Event ID: 10073, 10075, 31101, 31102, 31106, 31107, 31114 & 31283</td><td>
<table>
<tr><td>me</td><td>Upgrade State</td><td>OAM Max HA Role</td><td>Server Role</td><td>Function</td><td>Application Version</td><td>Start Time</td></tr>
<tr><td></td><td>Server Status</td><td>Appl Max HA Role</td><td>Network Element</td><td></td><td>Upgrade ISO</td><td>Status Message</td></tr>
</table>
<table>
<tr><th>Sequence</th><th>Upgrade State</th><th>Status Message</th></tr>
<tr><td rowspan="2">1.</td><td rowspan="2">Pending</td><td>Upgrade task started (Upgrade Server option)</td></tr>
<tr><td>Pending Upgrade (Auto Upgrade option)</td></tr>
<tr><td>2.</td><td>Validating</td><td>ISO validation started - Server: <hostname>, ISO: <iso_image></td></tr>
<tr><td>3.</td><td>Upgrading</td><td>Upgrade is in Progress</td></tr>
<tr><td>4.</td><td>Rebooting</td><td>Warn: failed to get TPD task state, server could be rebooting.</td></tr>
<tr><td>5.</td><td>Success / Not Ready</td><td>Upgraded Server to new ISO</td></tr>
<tr><td>6.</td><td>Accept or Reject</td><td>Success: Server upgrade is complete</td></tr>
</table>
</td></tr>
</table>

!!! IMPORTANT !!!

- Unless executing parallel upgrades, **DO NOT PROCEED** until an **“Upgrade State”** of **“Accept or Reject”** is received.
- If an Upgrade failure is experienced (i.e. **Upgrade State** = **Failed**), refer to **Appendix I:** *Recovering from a Failed Upgrade.*

11. ☐	**Primary NOAM VIP:** Post-upgrade, alarms shown to the right are expected and should be ignored.	• Once the **“Accept or Reject” Upgrade State** is reached, the following alarm(s) will be raised for each upgraded server: **Event ID(s):** ***32532*** *(Server Upgrade Pending Accept/Reject)*
12. ☐	**Return to the referring Procedure.**	• The user should now return to the **Procedure/Step** which referred them to **Appendix D** *(Server Upgrade Administration on HLRR 4.1)*.
THIS PROCEDURE HAS BEEN COMPLETED		

APPENDIX E. BACKOUT OF A SINGLE SERVER

Every attempt should be made to correct any actionable post upgrade issue prior to executing a backout. Therefore, the user should always contact **"My Oracle Support"** if troubleshooting assistance is needed. Refer to ***Appendix J*** - *Accessing My Oracle Support (MOS),* for more information on contacting Oracle Customer Service.

NOTE: *The user is expected to already be familiar with all aspects of the GUI required for backout since the backout procedure re-uses many of the same GUI screens as the upgrade process. Therefore, the following backout procedure has been stream-lined by focusing on written instruction rather than screen captures.*

Appendix E: Backout of a Single Server

Step	Procedure	Result
1. ☐	Using the VIP address, access **the Primary HLRR NOAM GUI**.	• Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
2. ☐	**Primary NOAM VIP:** Ensure that the server to be backed out is in the **"Accept or Reject"** state.	**1.** Select the **[Main Menu: Administration →Software Management → Upgrade]** screen. **2.** Select the **tab** containing the server(s) to be backed out. **3.** Verify its **Upgrade State** is **"Accept or Reject"**.
3. ☐	**Primary NOAM VIP:** Set the **Max Allowed HA Role** to **"Standby"**.	**1.** Select the **[Main Menu: Status & Manage →HA]** screen. **2.** Click the **"Edit"** button. **3.** Select the server(s) to be backed out and choose a **Max Allowed HA Role** value of **"Standby"** *(unless it is a **Query server**, in which case the value should remain set to **Observer**)*. **4.** Click the **"Ok"** button *(the HA status screen displays).* **5.** Verify that the **Max Allowed HA Role** is set to the values specified above for each server to be backed out.

- If performing backout on the **Primary NOAM "Active"** server, then continue with **Step 4** of this procedure.
- For all other server backouts, **SKIP** to **Step 8** of this procedure.

4. ☐	**Primary NOAM VIP:** When upgrade is initiated on the **"Active" Primary NOAM** server, an **HA Switchover** will occur.	• The user will be **disconnected** from the **GUI** session as the **"Active" Primary NOAM** server goes through **HA Switchover** and becomes the **"Standby"** server.
5. ☐	**Primary NOAM VIP:** If not automatically **logged out** of the **GUI**, use the **[Logout]** link in the top right of the browser to logout of the **Primary NOAM GUI**.	

Appendix E: Backout of a Single Server

Step	Procedure	Result
6. ☐	**Primary NOAM VIP (GUI):** **Clear the browser cache.** **!! IMPORTANT !!** ***DO NOT*** *proceed to the next step until the* ***browser cache*** *has been* ***cleared****.*	JavaScript libraries, images and other objects are often modified in the upgrade. Browsers can sometimes cause GUI problems by holding on to the old objects in the built-in cache. To prevent these problems always clear the browser cache before logging into an OAM GUI which has just been upgraded: **1)** Simultaneously hold down the **[Ctrl]**, **[Shift]** and **[Delete]** keys *(most Web browsers)*. **2)** Select the appropriate object types to delete from the cache via the pop-up dialog. *(e.g.* ***"Temporary Internet Files", "Cache"*** *or* ***"Cached images and files"****, etc.).* Other browsers may label these objects differently. **Clear the cached data.**
7. ☐	Once again, use the **VIP** address to access the **Primary NOAM GUI**.	• Using the **VIP** address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
8. ☐	**Primary NOAM VIP (GUI):** **Stop** the software.	**1.** Select the **[Main Menu: Status & Manage → Server]** screen. **2.** Select the server(s) to be backed out and click the **"Stop"** button. **NOTE:** *If multiple servers are to be selected, holding down the* ***[CTRL]*** *key allows the cursor to* ***multi-select*** *servers on the* ***[Main Menu: Status & Manage → Server]*** *screen.* **3.** Click the **"OK"** button on the confirmation pop-up box. **4.** Verify that the value for the **"Appl State"** changes to **"Disabled".**
9. ☐	**Primary NOAM VIP:** Verify that the server(s) are **Backout Ready**.	**1.** Select the **[Main Menu: Administration →Software Management → Upgrade]** screen. **2.** Select the **tab** of the server group containing the server(s) to be backed out. **3.** Verify that the server(s) to be backed out display the correct value for the **"Upgrade State"** field.

- If the **Primary NOAM "Active"** server is at **Release 4.1**, then verify that the **Upgrade State** for the server(s) to be backed out display a value of **"Backout Ready"**.
- If the **Primary NOAM "Active"** server is at **Release 4.0**, then verify its **Upgrade State** for the server(s) to be backed out display a value of **"Ready"**.

10. ☐	**Server CLI:**
	SSH to the **CLI** of the server(s) to be backed out and login with the **admusr** account.
		`CentOS release 6.7`
		`Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64`
		
		`exhrNO-mrsvnc-b login: admusr`
		`Password: <admusr_password>`

11. ☐	**Server CLI:**
	The user will be presented with output similar to that shown to the right.
		***** TRUNCATED OUTPUT *****
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds`
		`PROMPATH=/opt/comcol/prod`
		`RUNID=00`
		`[admusr@exhrNO-mrsvnc-b ~]$`

Appendix E: Backout of a Single Server

Step	Procedure	Result

12. ☐	**Server CLI:**
	Execute the backout script.
		Execute the backout using the reject script:
		`$ sudo /var/TKLC/backout/reject`
		Output similar to that shown below will appear on the screen.
		Answer **"y"** to continue the backout.
		***** TRUNCATED OUTPUT *****
		`Executing.. /var/TKLC/backout/backout_server --check`
		`Verifying that backout is possible.`
		`Checking for stale RPM DB locks...`
		`Current platform version:  7.0.2.0.0-86.30.0`
		`Continue backout?  [y/N]: y`

13. ☐	**Server CLI:** The backout script will be followed by an **automated reboot** at its completion.	Many informational messages will come across the terminal screen as the backout proceeds: Finally, after the backout script is complete, the server will automatically **reboot** and the user will be logged out.

14. ☐	**Server CLI:**
	After the reboot has completed, use **SSH** to reconnect to the server(s) to be backed out and login with the **admusr** account.
		`CentOS release 6.7`
		`Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64`
		`exhrNO-mrsvnc-b login: admusr`
		`Password: <admusr_password>`

15. ☐	**Server CLI:**
	The user will be presented with output similar to that shown to the right.
		***** TRUNCATED OUTPUT *****
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds`
		`PROMPATH=/opt/comcol/prod`
		`RUNID=00`
		`[admusr@exhrNO-mrsvnc-b ~]$`

16. ☐	**Server CLI:**
	Verify the Backout.
		Examine the upgrade logs in the directory /var/TKLC/log/upgrade and verify that no errors were reported:
		`$ grep ERROR /var/TKLC/log/upgrade/upgrade.log`
		1. Examine the output of the above commands to determine if any errors were reported.
		Example output:
		`1461771238::  19235  SS7  Received M3UA ERROR`
		`None  EH  ..  ..  Normal`
		`0  10  B  NoCount  0  0`
		`**********  Received M3UA ERROR`
		`$`
		NOTE: *Output such as that shown above can be safely ignored.*
		2. If the backout was not successful because other errors were recorded in the logs, then contact **"My Oracle Support" (MOS)** for further instructions.
		3. If the backout was successful (no actionable errors or failures), then continue with the remaining steps.

Appendix E: Backout of a Single Server

Step	Procedure	Result

17. ☐	**Server CLI:**
	Restore the COMCOL Full DB/Run environment.
	
	NOTE: *The COMCOL restore process may take several minutes to complete.*
		Execute the backout_restore utility to restore the full database run environment.
		
		`$ sudo /var/tmp/backout_restore`
		
		Output similar to that shown below will appear on the screen.
		Answer **"y"** to continue the restore.
		
		***** TRUNCATED OUTPUT *****
		`This process will totally destroy the existing DB on this server.`
		`This should only be done to recover a server when an upgrade has been backed-out/rolled-back.`
		
		`Are you sure you want to proceed? (y|n): y`
		
		If the restore was successful, the following will be displayed:
		
		`Success: Full restore of COMCOL run env has completed.`
		`Return to the backout procedure document for further instruction.`
		
		If an error is encountered and reported by the utility, then work with Oracle Customer Care Center for further instructions.

18. ☐	**Server CLI:**
	Reboot the server.
	
	NOTE: *This step will take several minutes to complete. As the server* ***reboots,*** *the user will be logged out of the SSH session.*
		Enter the following commands to reboot the server.
		
		`$ sudo -i init 6`
		
		***** TRUNCATED OUTPUT *****
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/awptransportmgr:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/awpss7:/usr/TKLC/exhr`
		`PRODPATH=/opt/comcol/prod`
		`RUNID=00`
		`$`

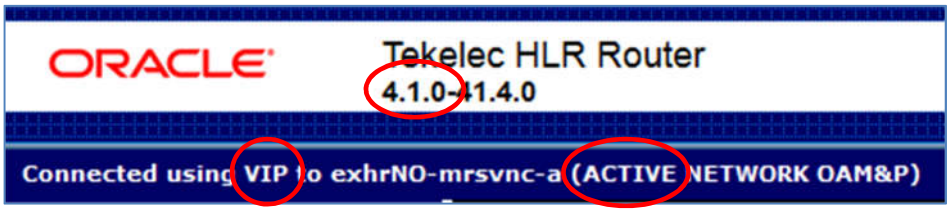
19. ☐	**Server CLI:**
	After the reboot has completed, use **SSH** to reconnect to the server(s) to be backed out and login with the **admusr** account.
		`CentOS release 6.7`
		`Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64`
		
		`exhrNO-mrsvnc-b login:` **`admusr`**
		`Password:` ***`<admusr_password>`***

20. ☐	**Server CLI:**
	The user will be presented with output similar to that shown to the right.
		***** TRUNCATED OUTPUT *****
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds`
		`PROMPATH=/opt/comcol/prod`
		`RUNID=00`
		`[admusr@exhrNO-mrsvnc-b ~]$`

Appendix E: Backout of a Single Server

Step	Procedure	Result

21. ☐	**Server CLI:**
	Verify that the **"httpd"** service has restarted.
	
	NOTE: If httpd is still not running after 3 minutes, then services have failed to restart. Contact **"My Oracle Support" (MOS)** for further instructions.
		Verify services are have restarted:
		
		1. If this is an NOAM or SOAM, verify httpd service is running.
		
		`$ sudo -i service httpd status`
		
		2. Verify expected output displays httpd is running (the process IDs are variable so the actual number value can be ignored):
		
		`*** TRUNCATED OUTPUT ***`
		`PRODPATH=/opt/comcol/prod`
		`RUNID=00`
		`httpd (pid 12800) is running...`
		`$`
		
		3. If httpd is not running, wait for a few minutes and retry the above command.

22. ☐	Using the VIP address, access **the Primary HLRR NOAM GUI**.	• Using the **VIP** address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
23. ☐	Verify the **release** level of the **Primary NOAM "Active"** server from the information presented in the GUI banner and record it in the space provided to the right.	 **Primary NOAM "Active" server Release Level: _____**
24. ☐	**Primary NOAM VIP (GUI):** Verify the server(s) **Application Version** and **Upgrade State.**	**1.** Select the **[Main Menu: Administration →Software Management → Upgrade]** screen. **2.** Select the **tab** containing the server(s) which were backed out. **3.** Verify the **Application Version** value for this server has been backed out to the **source** release version. **4.** Verify the **Upgrade State**.

For Primary NOAM "Active" server at release 4.1:

- If the **Upgrade State** is **"Ready"**, **SKIP** to **Step 30** of this procedure.
- If the **Upgrade State** is **"Not Ready"**, then proceed to **Step 25** of this procedure.

For Primary NOAM "Active" server at release 4.0: *(i.e after backout of the entire topology)*

- If the **Upgrade State** is **"Not Ready"**, then **SKIP** to **Step 30** of this procedure.
- If the **Upgrade State** is **"Ready"**, then **SKIP** to **Step 28** of this procedure.

Appendix E: Backout of a Single Server

Step	Procedure	Result
25. ☐	**Primary NOAM VIP:** ***(Primary NOAM "Active" server release at 4.1)*** Set the **Max Allowed HA Role** to **"Active"**.	Due to backout being initiated from the command line instead of through the GUI, you will have to modify the backed out server so its **Upgrade State** moves to **Ready**. **1.** Select the **[Main Menu: Status & Manage → HA]** screen. **2.** Click the **"Edit"** button. **3.** Select the backed out server(s) and choose a **Max Allowed HA Role** value of **Active** *(unless it is a **Query server**, in which case the value should be set to **Observer**)*. **4.** Click the **"Ok"** button; *the HA status screen displays.* **5.** Verify that the **Max Allowed HA Role** is set to the values specified above for each backed out server.
26. ☐	**Primary NOAM VIP:** **Restart** the software.	**1.** Select **[Main Menu: Status & Manage → Server]** screen. **2.** If the server(s) which were backed out show an **Appl State** state of **"Enabled"**, **SKIP** to the **Step 27**. **3.** If the server(s) which were backed out show an **Appl State** state of **"Disabled"**, select the server(s) and click the **"Restart"** button. **4.** Click **"OK"** button on the pop-up confirmation box. **5.** Verify that the **Appl State** has changed to **"Enabled"**.
27. ☐	**Primary NOAM VIP:** **Verify** the **Upgrade State**.	**1.** Select **[Main Menu: Administration → Software Management →Upgrade]** screen. **2.** Select the **tab** of the server group containing the server(s) which were backed out. **3.** Verify that the **Upgrade State** is now **"Ready"** (*it may take several seconds for the grid to update)*. **4. SKIP** to **Step 30** of this procedure.
28. ☐	**Primary NOAM VIP:** ***(Primary NOAM "Active" server release at 4.0)*** **Stop** the software *(if necessary)*.	Due to backout being initiated from the command line instead of through the GUI, you may have to modify the **Upgrade State** of the backed out server(s) to achieve a state of **"Not Ready"**. **1.** Select **[Main Menu: Status & Manage →Server]** screen. **2.** If the server(s) which were backed out show an **Appl State** of **"Enabled"**, then select the server(s) and click the **Stop** button**.**

Appendix E: Backout of a Single Server

Step	Procedure	Result
29. ☐	**Primary NOAM VIP:** Verify the server(s) **Upgrade State.**	1. Select **[Main Menu: Administration → Software Management → Upgrade]** screen. 2. If the server(s) which were backed out show an **Upgrade State** of **"Not Ready"**, **SKIP** to **Step 30** of this procedure.
30. ☐	**Backout** has been completed.	• **Return to the referring procedure.**
THIS PROCEDURE HAS BEEN COMPLETED		

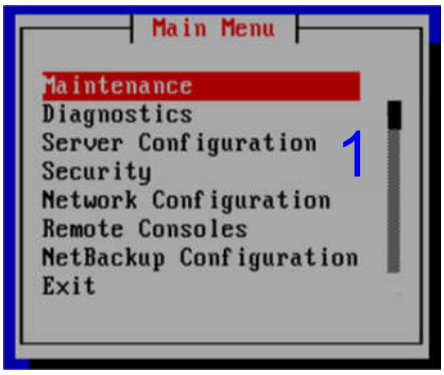
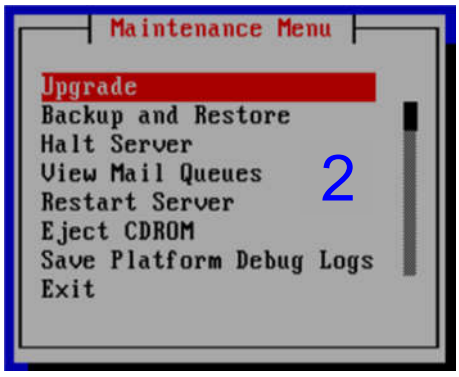
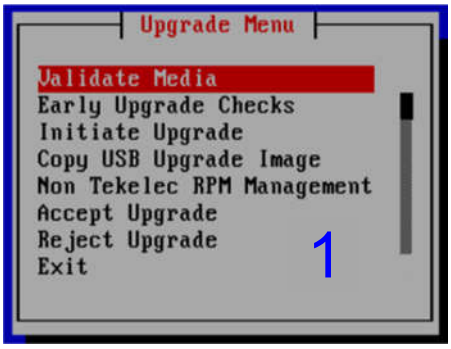
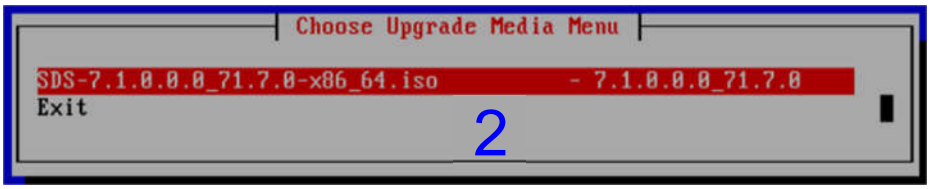
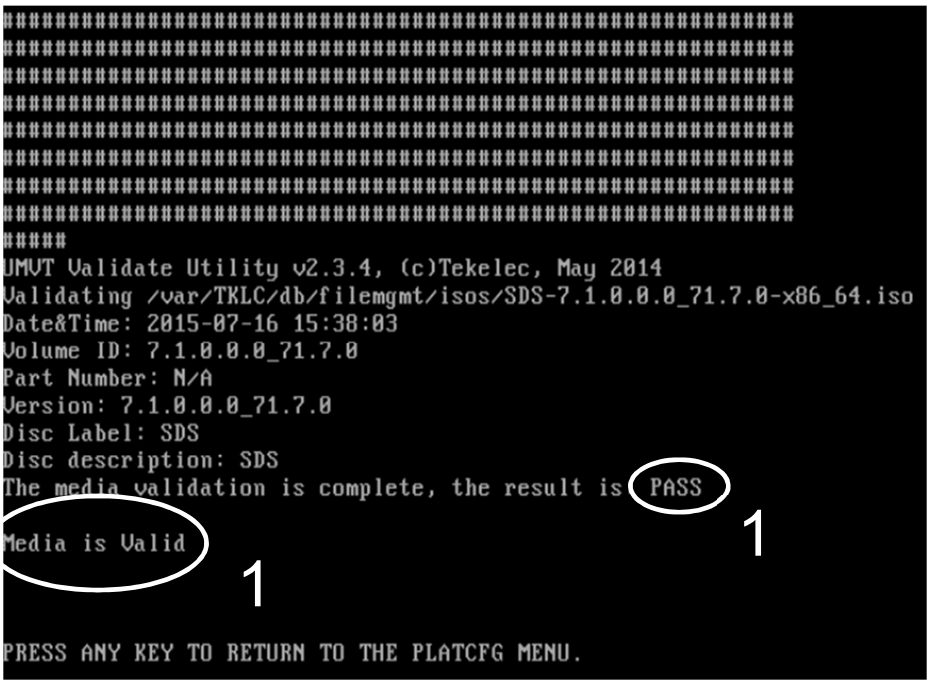
APPENDIX F. MANUALLY PERFORMING ISO VALIDATION

NOTE: This a procedure assumes that the **ISO** file to be validated has already been uploaded to the server in question and is present in the **/var/TKLC/db/filemgmt/**, **/var/TKLC/db/filemgmt/isos/** or **/var/TKLC/upgrade/** directory.

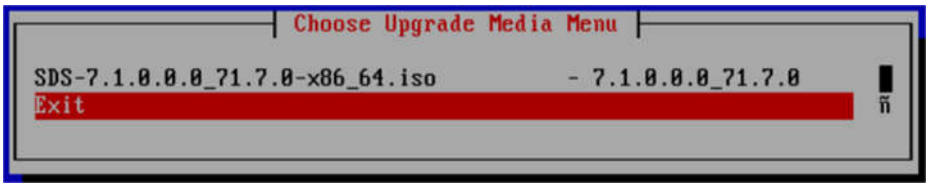
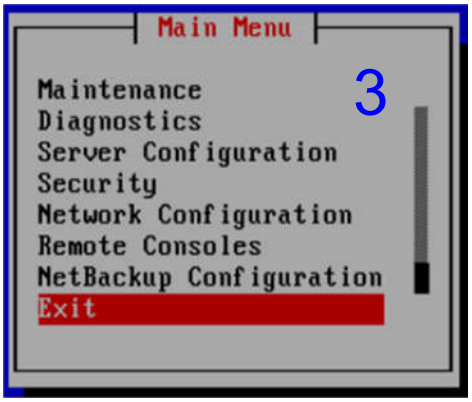
Appendix F: Manually Performing ISO Validation

Step	Procedure	Result
1. ☐	**Primary NOAM VIP (CLI):** Using the **VIP** address, login to the **"Active" Primary HLRR NOAM** with the **admusr** account.	CentOS release 6.7 Kernel 2.6.18-274.4.1.e15prerel5.0.0_72.32.0 on an x86_64 exhrNO-rlghnc-a login: **admusr** Password: ***<admusr_password>***
2. ☐	**Primary NOAM VIP:** The user will be presented with output similar to that shown to the right.	RELEASE=6.4 RUNID=00 VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds PROMPATH=/opt/comcol/prod RUNID=00 [admusr@exhrNO-rlghnc-a ~]$
3. ☐	**Primary NOAM VIP:** Verify that the ISO file is present in the **/var/TKLC/upgrade/** directory. If the ISO file to be validated is present in the output then **SKIP** to **Step 5** of this procedure. Otherwise, continue to the next step.	[admusr@exhrNO-rlghnc-a ~]$ **ls /var/TKLC/upgrade/** HLR Router-4.1.0.0.0_71.11.0-x86_64.iso [admusr@exhrNO-rlghnc-a ~]$
4. ☐	**Primary NOAM VIP:** **Copy** the ISO file to the **/var/TKLC/upgrade/** directory.	[admusr@exhrNO-rlghnc-a ~]$ **cp -p /var/TKLC/db/filemgmt/HLR Router-4.1.0.0.0_71.11.0-x86_64.iso /var/TKLC/upgrade/** [admusr@exhrNO-rlghnc-a ~]$
5. ☐	**Primary NOAM VIP:** Become the **"platcfg"** user using the **"su"** command. For password information, refer to **Table 4** *(Logins, Passwords and Site Information) if necessary*.	[admusr@exhrNO-rlghnc-a ~]$ **su - platcfg** Password: ***<platcfg_password>***

Appendix F: Manually Performing ISO Validation

Step	Procedure	Result
6. ☐	**Primary NOAM VIP:** **1)** From the **platcfg [Main Menu]**, select the **"Maintenance"** menu option and press the **[ENTER]** key. **2)** From the **platcfg [Maintenance Menu]**, select the **"Upgrade"** menu option and press the **[ENTER]** key.	 
7. ☐	**Primary NOAM VIP:** **1)** From the **platcfg [Upgrade Menu]**, select the **"Validate Media"** menu option and press the **[ENTER]** key. **2)** From the **platcfg [Choose Upgrade Media Menu]**, select the target **ISO** file and press the **[ENTER]** key.	 
8. ☐	**Primary NOAM VIP:** **1)** Verify that the **ISO** Media is **"Valid"**. **2)** Press the **[ENTER]** key to return to the **platcfg** menu.	

Appendix F: Manually Performing ISO Validation

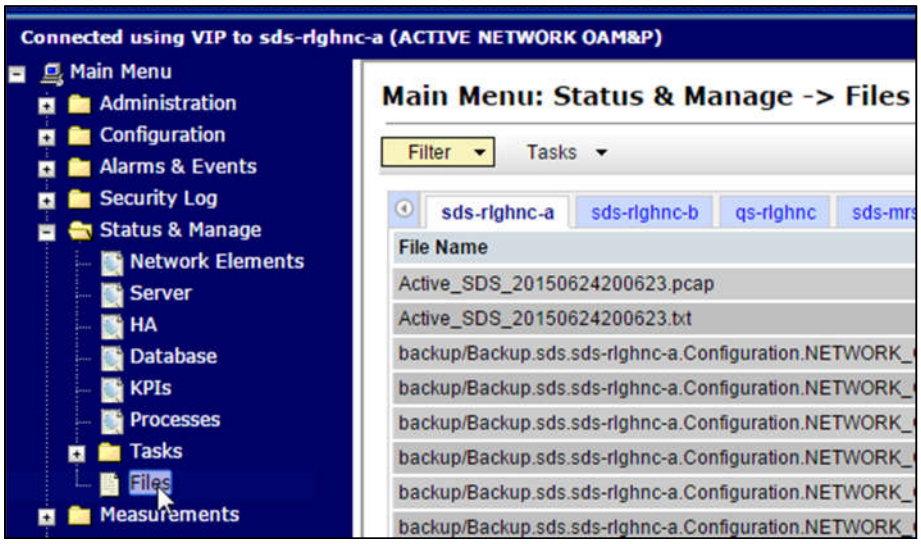
Step	Procedure	Result
9. ☐	**Primary NOAM VIP:** From the **platcfg [Choose Upgrade Media Menu]**, select the **"Exit"** menu option and press the **[ENTER]** key.	
10. ☐	**Primary NOAM VIP:** **1)** From the **platcfg [Main Menu]**, select the **"Exit"** menu option and press the **[ENTER]** key. **2)** From the **platcfg [Maintenance Menu]**, select the **"Exit"** menu option and press the **[ENTER]** key. **3)** From the **platcfg [Main Menu]**, select the **"Exit"** menu option and press the **[ENTER]** key.	  
11. ☐	**Primary NOAM VIP:** Exit the CLI to the Active Primary HLRR NOAM.	`[admusr@exhrNO-rlghnc-a ~]$ exit`
12. ☐	**Return to the referring Procedure.**	• The user should now return to the **Procedure/Step** which referred them to **Appendix F** *(Manually Performing ISO Validation)*.
THIS PROCEDURE HAS BEEN COMPLETED		

APPENDIX G. UNDEPLOYING AN ISO FILE *(POST UPGRADE ACCEPTANCE)*

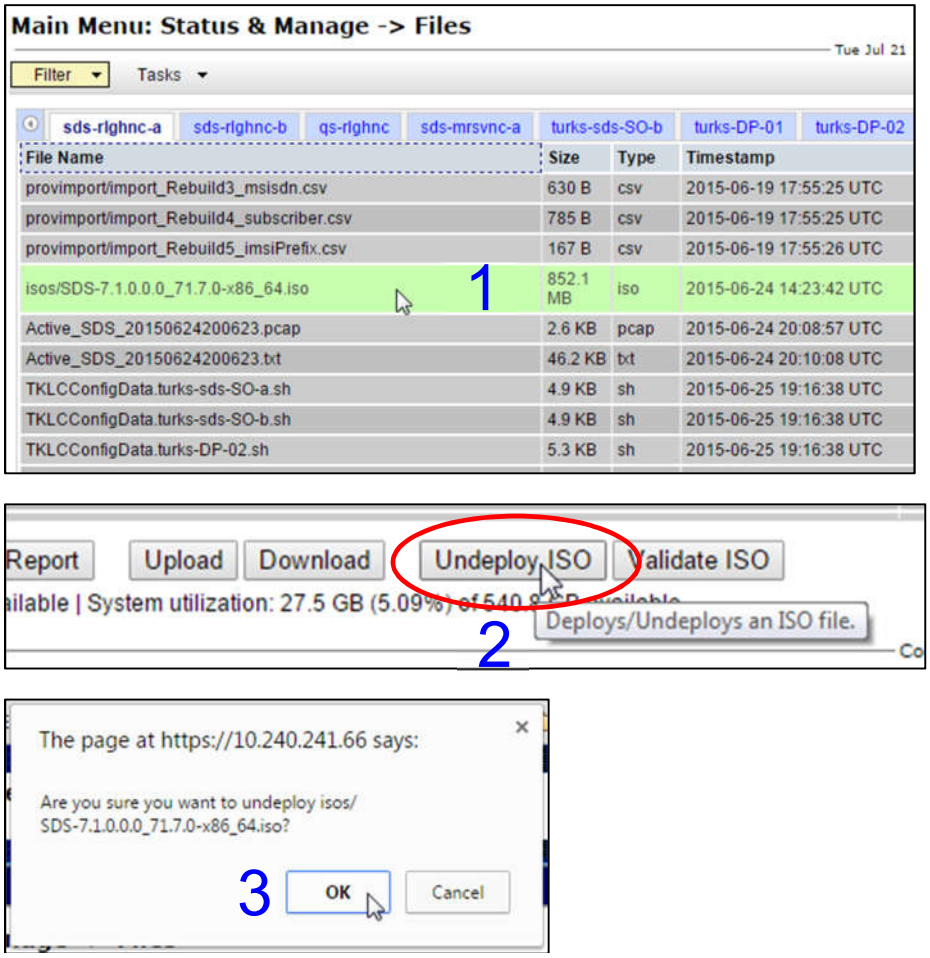
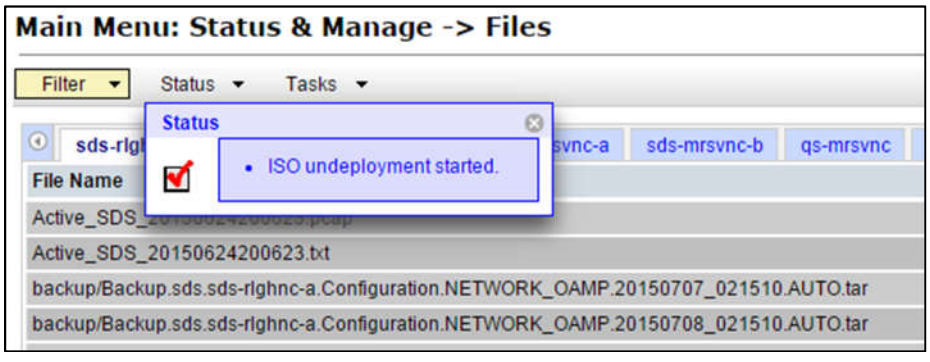
This procedure should only be executed post Upgrade Acceptance and removes a deployed **ISO** file from all servers in the HLR Router topology except the **"Active" Primary NOAM** server. At the end of the procedure the ISO will still be present in the **/var/TKLC/db/filemgmt/isos/** directory on the **"Active" Primary NOAM** server.

Once this procedure is completed, the file may then be manually deleted *(if desired)* from the HLRR NOAM GUI (VIP) under the [Main Menu: Status & Manage → Files] screen.

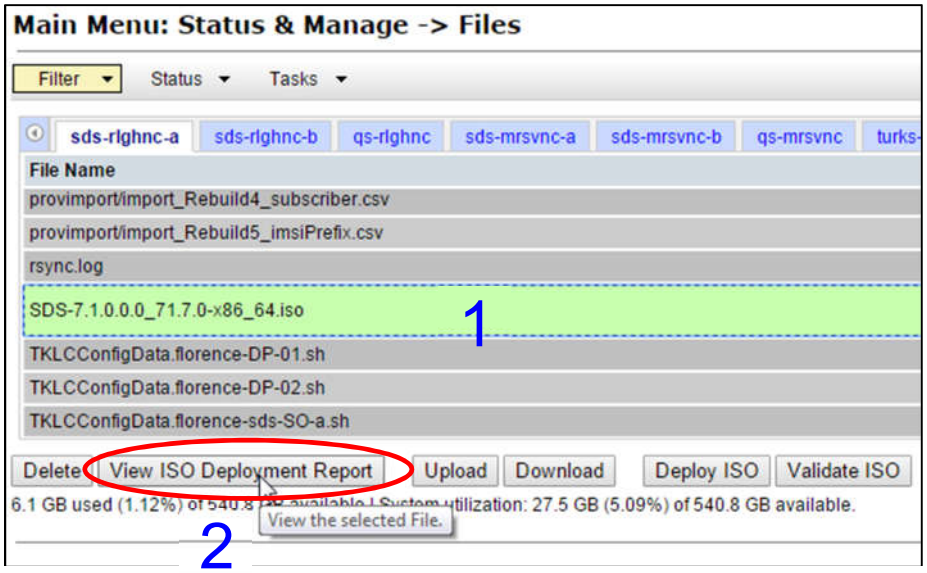
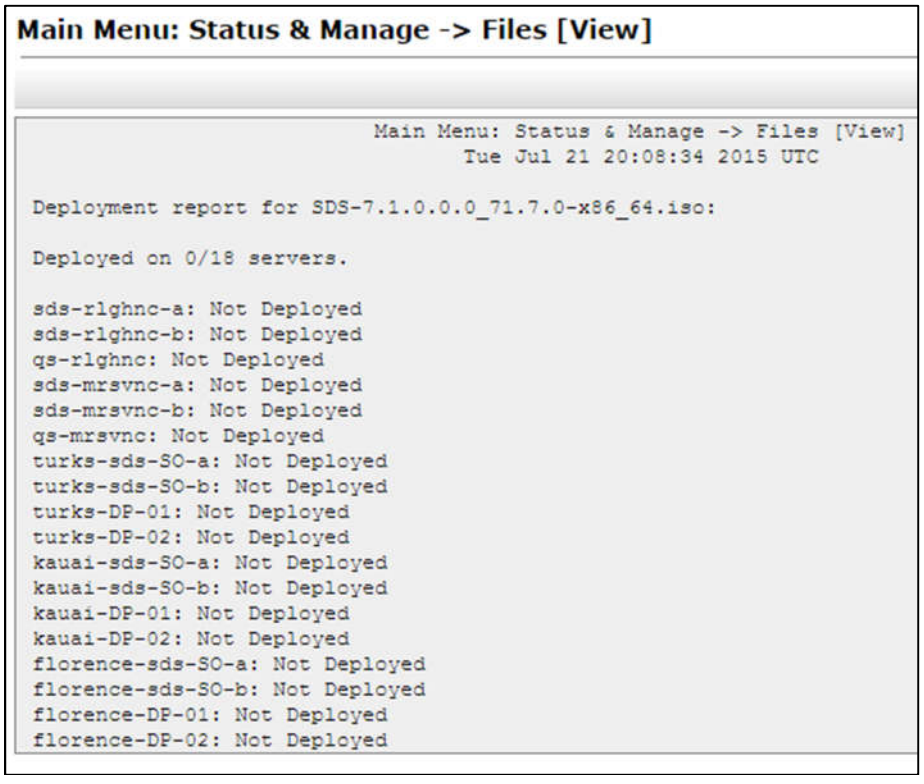
Appendix G: Undeploying an ISO file *(Post Upgrade Acceptance)*

Step	Procedure	Result
1. ☐	Using the VIP address, access **the Primary HLRR NOAM GUI**.	• Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
2. ☐	**Primary NOAM VIP (GUI):** Select… **Main Menu** **→ Status & Manage** **→ Files** …as shown on the right.	

Appendix G: Undeploying an ISO file *(Post Upgrade Acceptance)*

Step	Procedure	Result
3. ☐	**Primary NOAM VIP:** **1)** Select the **ISO** file for the target release. **2)** Click the **"Undeploy ISO"** dialogue button. **3)** Click **"OK"** on the confirmation pop-up window.	
4. ☐	**Primary NOAM VIP:** The **"Status"** tab in the banner will display a confirmation message stating **"ISO undeployment started"**.	

Appendix G: Undeploying an ISO file *(Post Upgrade Acceptance)*

Step	Procedure	Result
5. ☐	**Primary NOAM VIP (GUI):** Monitor the ISO undeployment status. **1)** Using the cursor, reselect the **ISO** file for the target **4.1** release. **2)** Click the **"View ISO Deployment Report"** dialogue button.	
6. ☐	**Primary NOAM VIP (GUI):** The user is presented with the **Deployment Report** indicating the **current status** of undeployment to all servers in the topology. **Refresh** the report by clicking the **"Back"** dialogue button and repeating **Step 5** of this procedure until the **ISO** shows **"Not Deployed"** to all servers in the topology.	
THIS PROCEDURE HAS BEEN COMPLETED		

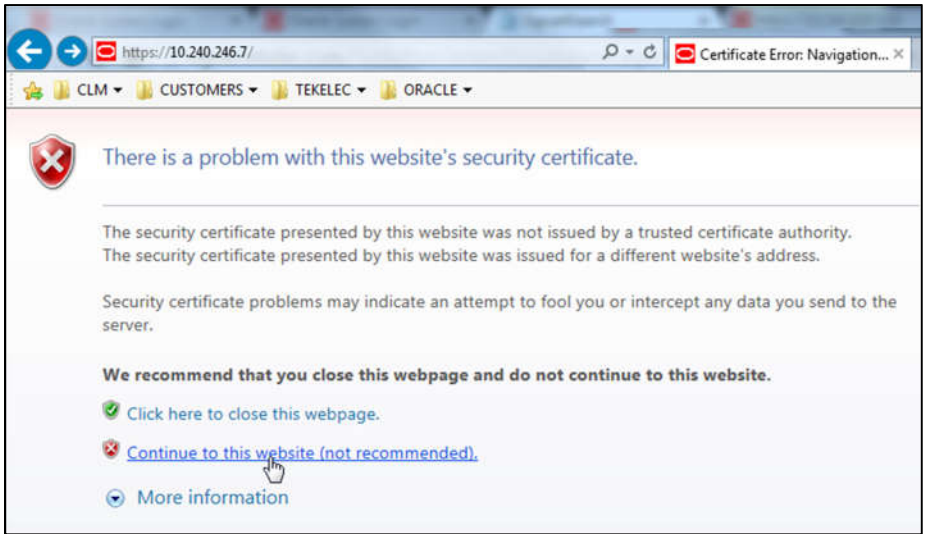
APPENDIX H. ADDING THE HLRR ISO TO THE PM&C SW REPOSITORY *(HP ONLY)*

This procedure must be done once for the PM&C located on the TVOE hosts of each HLR Router NOAM-A server.

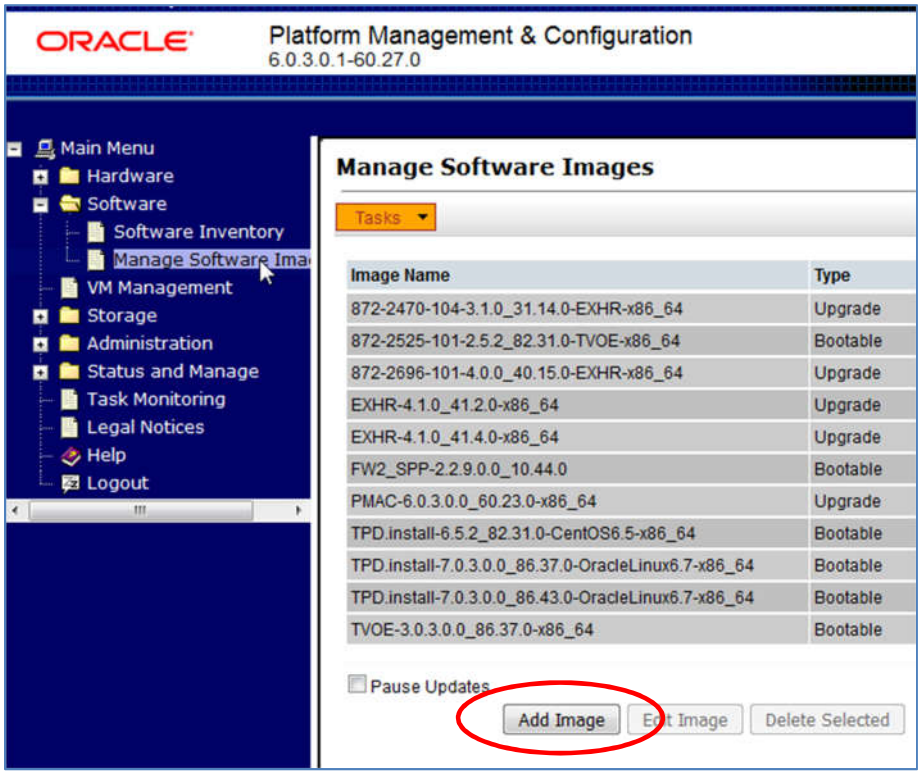
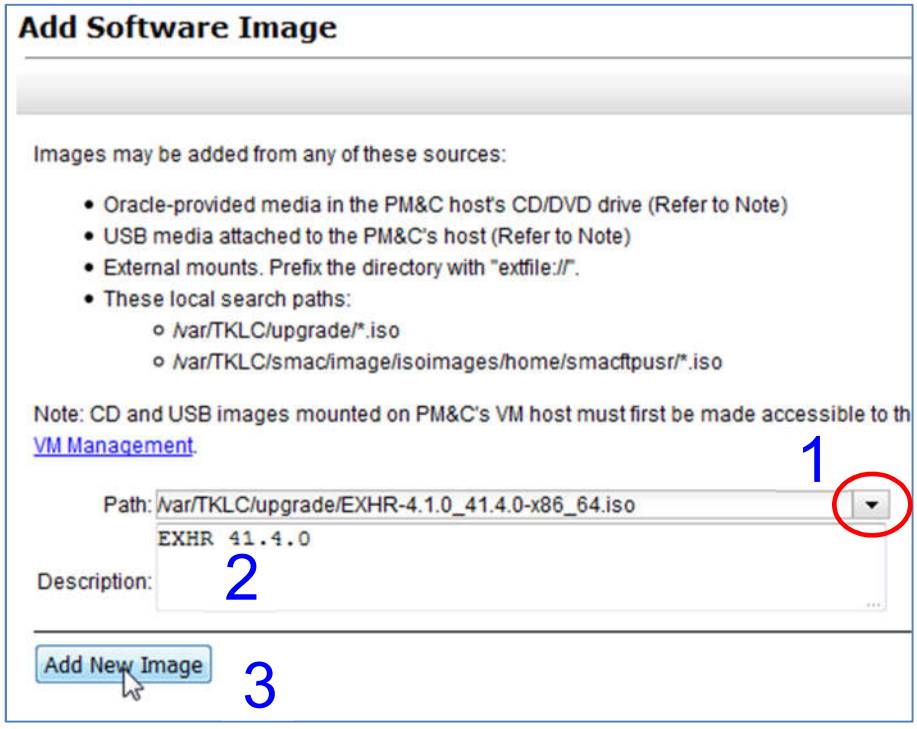
Appendix H: Adding the HLRR ISO to the PM&C SW Repository (***HP only)*** *(HP only)*

Step	Procedure	Result
1. ☐	**Primary NOAM VIP (CLI):** Using the **VIP** address, login to the **"Active" Primary HLRR NOAM** with the **admusr** account.	CentOS release 6.7 Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64 exhrNO-rlghnc-a login: **admusr** Password: ***<admusr_password>***
2. ☐	**Primary NOAM VIP:** The user will be presented with output similar to that shown to the right.	***** TRUNCATED OUTPUT ***** RELEASE=6.4 RUNID=00 VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds PROMPATH=/opt/comcol/prod RUNID=00 [admusr@exhrNO-rlghnc-a ~]$
3. ☐	**Primary NOAM VIP:** Access the **"filemgmt"** directory where the target ISO file was uploaded to.	[admusr@exhrNO-rlghnc-a ~]$ **cd /var/TKLC/db/filemgmt/** [admusr@exhrNO-rlghnc-a filemgmt]$
4. ☐	**Primary NOAM VIP:** Identify the exact name of the target ISO file.	[admusr@exhrNO-rlghnc-a filemgmt]$ **ls -l *.iso** -rw-rw-r-- 1 awadmin awadm 893536256 Jun 24 14:23 **872-2696-101-4.1.0_41.4.0-EXHR-x86_64.iso** [admusr@exhrNO-rlghnc-a filemgmt]$
5. ☐	**Primary NOAM VIP:** Use **Secure Copy (scp)** to copy the target ISO file to the **/var/TKLC/upgrade/** directory of the remote PM&C server as the **"admusr"** user.	$ **scp -p 872-2696-101-4.1.0_41.4.0-EXHR-x86_64.iso admusr@10.240.246.7:/var/TKLC/upgrade/** FIPS integrity verification test failed. The authenticity of host '10.240.246.7 (10.240.246.7)' can't be established. RSA key fingerprint is 23:aa:7e:12:40:d6:20:d6:19:62:c0:07:9d:20:30:35. Are you sure you want to continue connecting (yes/no)? **yes** Warning: Permanently added '10.240.246.7' (RSA) to the list of known hosts. Password: ***<admusr_password>*** 872-2696-101-4.1.0_41.4.0-EXHR-x86_64.iso 100% 852MB 11.2MB/s 01:16 [admusr@exhrNO-rlghnc-a filemgmt]$
6. ☐	**Primary NOAM VIP:** Exit the **CLI** for the **"Active" Primary HLRR NOAM.**	[admusr@exhrNO-rlghnc-a filemgmt]$ **exit** logout

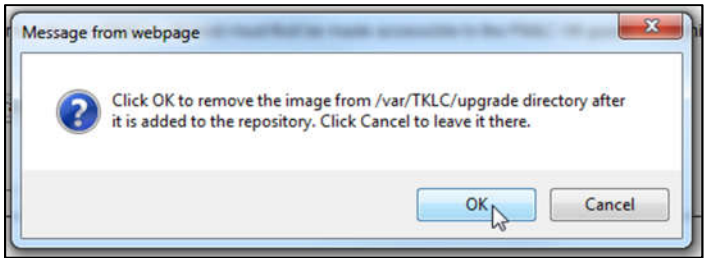
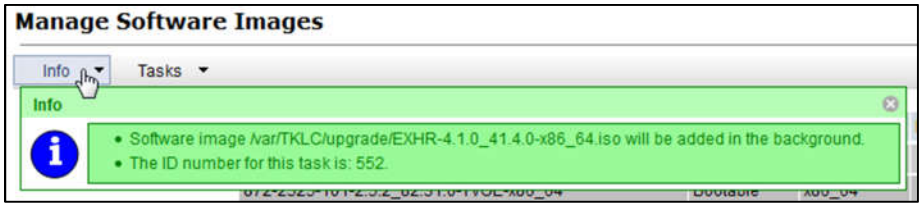
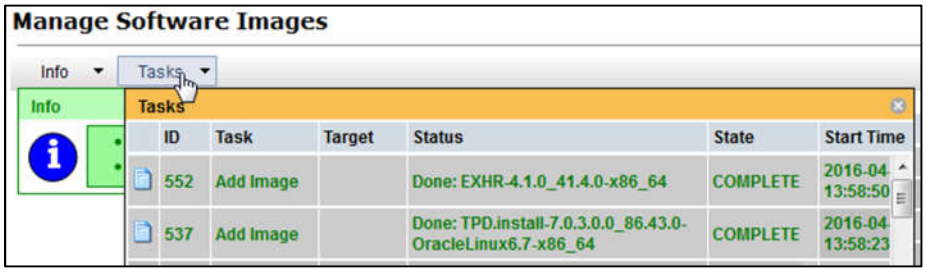
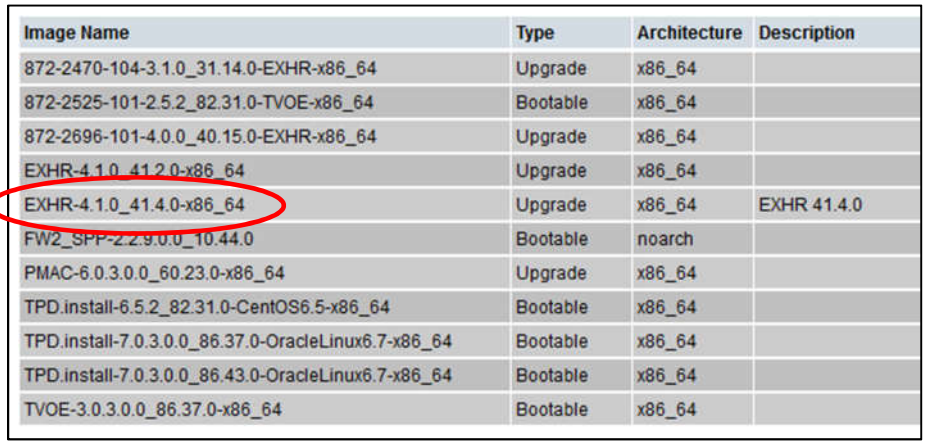
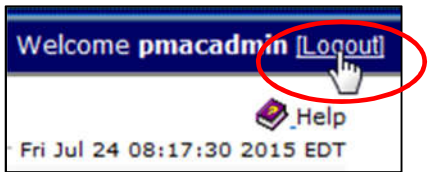
Appendix H: Adding the HLRR ISO to the PM&C SW Repository (***HP only)*** *(HP only)*

Step	Procedure	Result
7. ☐	**PM&C Server: (GUI):** **1)** Launch approved Web browser **Internet Explorer 8.0, 9.0** or **10.0** and connect to the Management IP Address assigned to **PM&C Server** associated with the **HLRR NOAM NE.** **2)** If a certificate error is received, click on the link which states… *"Continue to this website (not recommended)."*	
8. ☐	**PM&C Server:** The user should be presented a PM&C login screen similar to the one shown on the right. Login to the GUI using the default user and password.	

Appendix H: Adding the HLRR ISO to the PM&C SW Repository (***HP only***) *(HP only)*

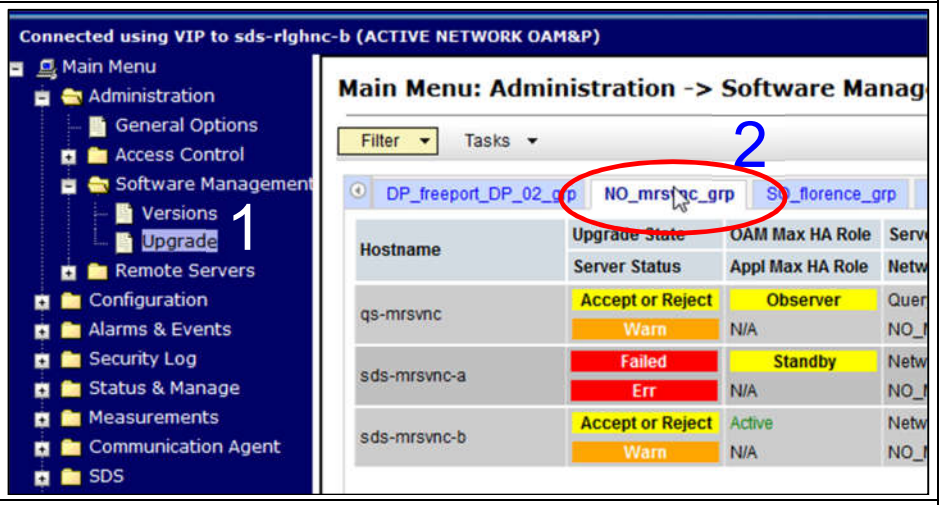
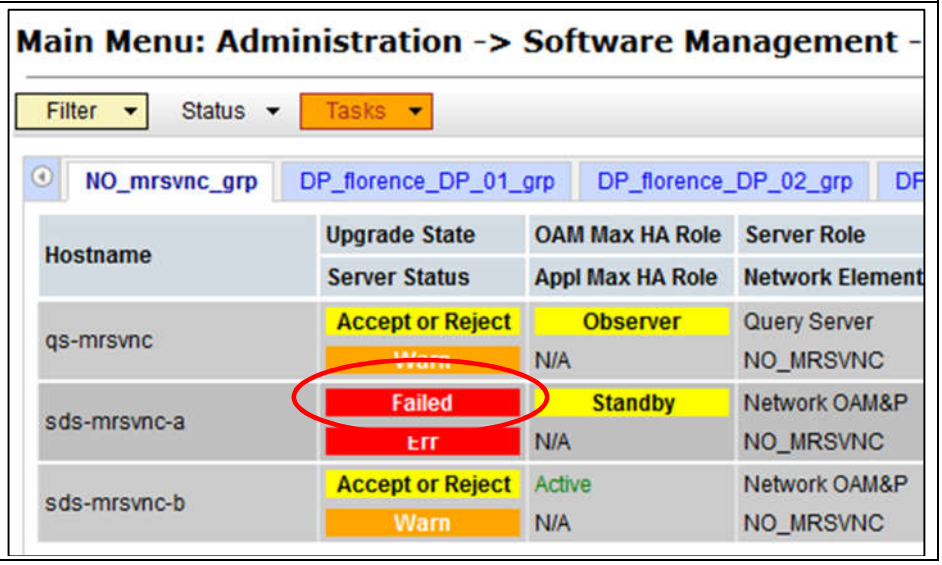
Step	Procedure	Result
9. ☐	**PM&C Server:** **1)** Select… **<u>Main Menu</u>** **→ Software** **→ *Manage Software Images*** …as shown on the right. **2)** Select the **"Add Image"** button	
10. ☐	**PM&C Server:** **1)** If the **ISO** does not automatically appear in the **Path:** field, click the **Path:** pull-down and select the target ISO file from the list. **2)** Input the **HLR Router release information** in the **"Description:"** field. **3)** Select **"Add New Image"** button.	

Appendix H: Adding the HLRR ISO to the PM&C SW Repository (***HP only***) *(HP only)*

Step	Procedure	Result
11. ☐	**PM&C Server:** Click **"OK"** on the pop-up confirmation box to allow the target ISO file to be deleted after it has been successfully added to the PM&C Software Repository.	
12. ☐	**PM&C Server:** An info message will be raised to show a new background task.	
13. ☐	**PM&C Server:** The user may monitor the progress using the **"Tasks"** tab in the banner on the same screen.	
14. ☐	**PM&C Server:** When the task is complete, the new software image will be displayed in the Image list.	
15. ☐	**PM&C Server:** Click the **"Logout"** link on the PM&C server GUI.	
THIS PROCEDURE HAS BEEN COMPLETED		

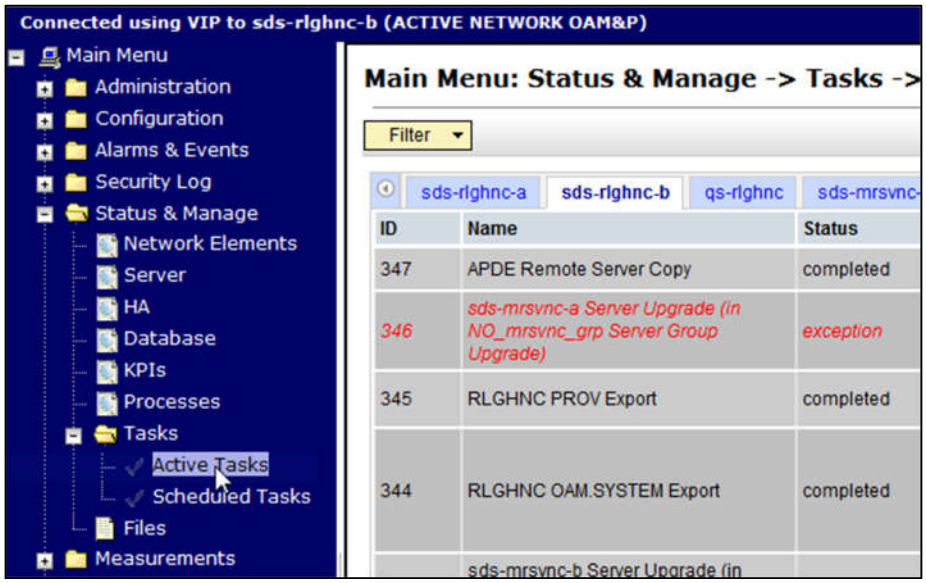
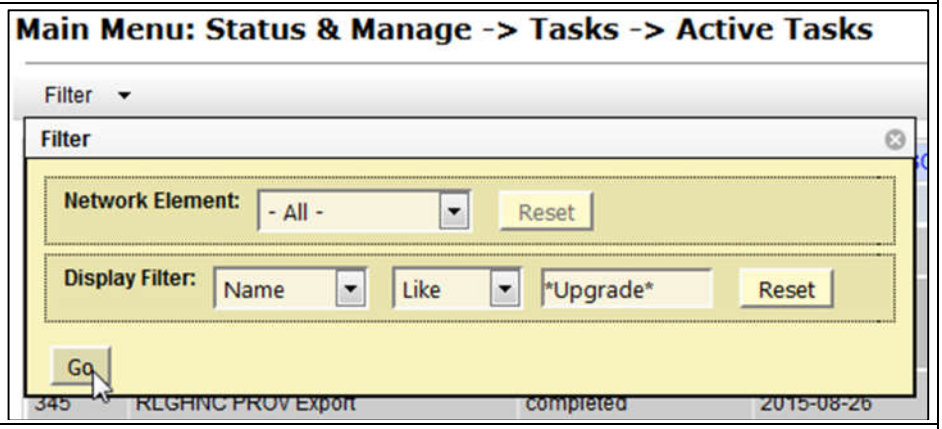
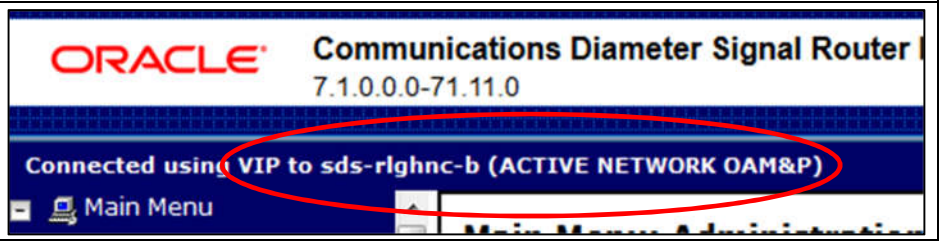
APPENDIX I. RECOVERING FROM A FAILED UPGRADE

Appendix I: Recovering from a Failed Upgrade

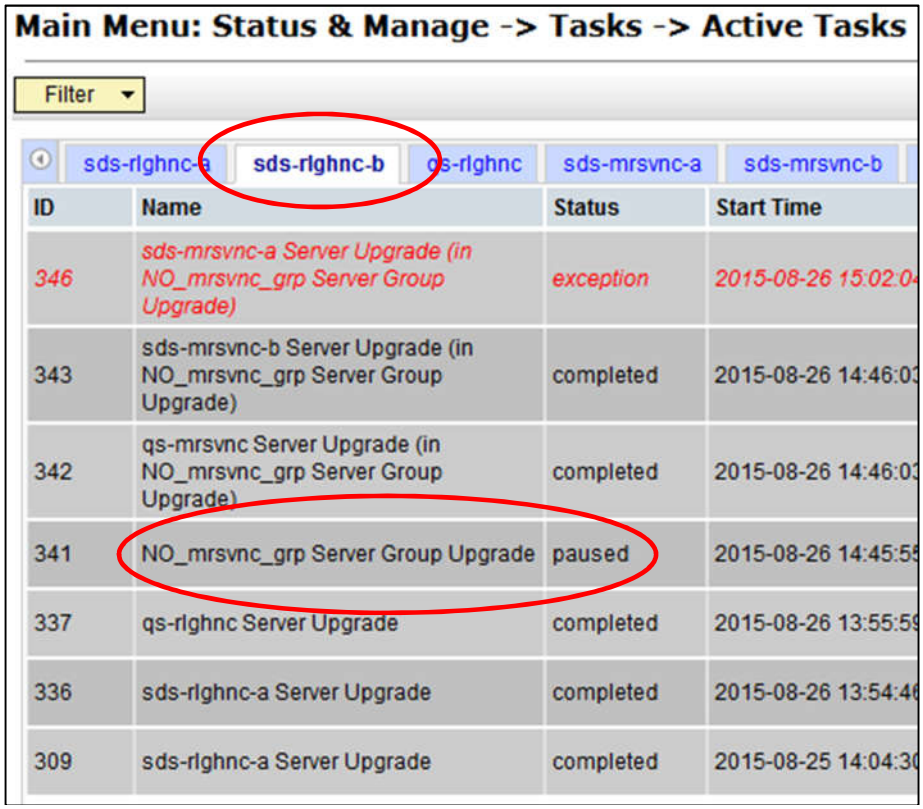
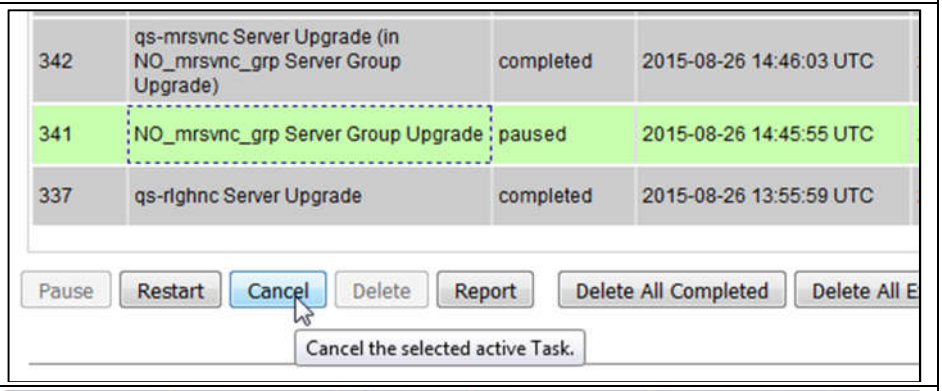
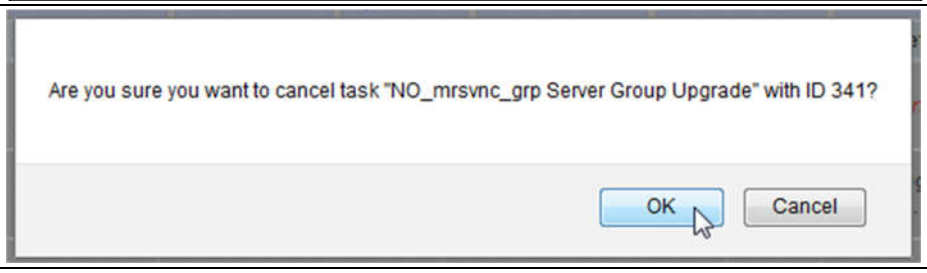
Step	Procedure	Result
1. ☐	Using the VIP address, access the **Primary HLRR NOAM GUI**.	Using the VIP address, access the **Primary HLRR NOAM GUI** as described in **Appendix A.**
2. ☐	**Primary NOAM VIP (GUI):** **1)** Select… **Main Menu** **→ Administration** **→Software Management** **→ Upgrade** **2)** Select **Server Group** tab for the server(s) being upgraded.	
3. ☐	**Primary NOAM VIP:** Verify the **"Upgrade State"** for each server undergoing SW upgrade. Identify *any Server(s) with an **"Upgrade State"** of **"Failed"**.*	

- If the **Failed Server** was upgraded using the **"Upgrade Server"** option, then **SKIP** to **Step 11** of this procedure.
- If the **Failed Server** was upgraded using the **"Auto Upgrade"** option *(i.e. Auto Server Group Upgrade)*, then **CONTINUE** to **Step 4** of this procedure.

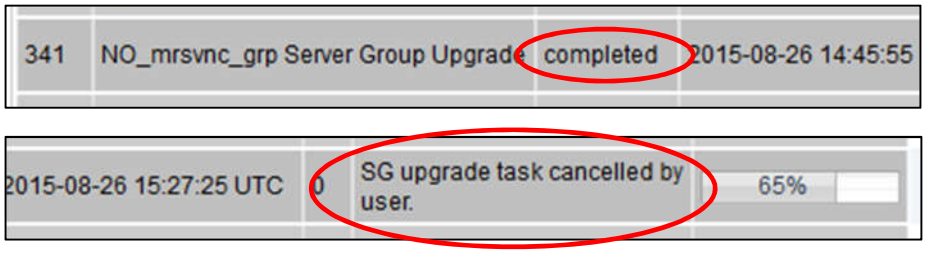
Appendix I: Recovering from a Failed Upgrade

Step	Procedure	Result
4. ☐	**Primary NOAM VIP:** Select… **Main Menu** **→ Status & Manage** **→Tasks** **→ *Active Tasks*** …as shown on the right.	
5. ☐	**Primary NOAM VIP:** Filter the **"Active Tasks"** screen setting the parameters as shown. **Display Filter Values:** ***1)*** *Name* ***2)*** *Like* ***3)*** **Upgrade**	
6. ☐	**Primary NOAM VIP:** Verify the **hostname** of the Primary **Active HLRR NOAM** server from the GUI banner.	

Appendix I: Recovering from a Failed Upgrade

Step	Procedure	Result
7. ☐	**Primary NOAM VIP:** **1)** If not auto-selected, select the **tab** displaying the **hostname** of the Primary **Active HLRR NOAM** server identified in the previous step. **2)** Locate the task for the **"Server Group Upgrade"**. It will show a **Status** of **"paused"**.	
8. ☐	**Primary NOAM VIP:** **1)** Select the **"Server Group Upgrade"** task with the cursor. It will become **highlighted** on the screen. **2)** Click the **"Cancel"** dialogue button to cancel the task.	
9. ☐	**Primary NOAM VIP:** Click the **"OK"** button on the confirmation box.	

Appendix I: Recovering from a Failed Upgrade

Step	Procedure	Result
10. ☐	**Primary NOAM VIP:** For the **"Server Group Upgrade"** task… **1)** Verify that the **Status** has changed from **"paused"** to **"completed"**. **2)** Verify that the **Result Details** column now states **"SG upgrade task cancelled by user."**	

11. ☐	**Failed Server (CLI):**
	Using the **XMI** address, login to the Failed Server with the **admusr** account.
		`CentOS release 6.7`
		`Kernel 2.6.32-573.18.1.e16prerel7.0.3.0.0_86.43.0.x86 on an x86_64`
		
		`exhrNO-mrsvnc-a login: admusr`
		`Password: <admusr_password>`

12. ☐	**Failed Server (CLI):**
	The user will be presented with output similar to that shown to the right.
		***** TRUNCATED OUTPUT *****
		`RELEASE=6.4`
		`RUNID=00`
		`VPATH=/var/TKLC/rundb:/usr/TKLC/appworks:/usr/TKLC/awpcommon:/usr/TKLC/comagent-gui:/usr/TKLC/comagent-gui:/usr/TKLC/comagent:/usr/TKLC/sds`
		`PROMPATH=/opt/comcol/prod`
		`RUNID=00`
		`[admusr@exhrNO-mrsvnc-a ~]$`

13. ☐	**Failed Server (CLI):**
	Inspect the **"upgrade.log"** file to identify the reason for the failure.
		`[admusr@exhrNO-mrsvnc-a ~]$ tail /var/TKLC/log/upgrade/upgrade.log`
		
		`1439256874:: INFO: Removing '/etc/my.cnf' from RCS repository`
		`1439256874:: INFO: Removing '/etc/pam.d/password-auth' from RCS repository`
		`1439256874:: INFO: Removing '/etc/pam.d/system-auth' from RCS repository`
		`1439256874:: INFO: Removing '/etc/sysconfig/network-scripts/ifcfg-eth0' from RCS repository`
		`1439256874:: INFO: Removing '/var/lib/prelink/force' from RCS repository`
		`1439256874::Marking task 1439256861.0 as finished.`
		`1439256874::`
		`1440613685::Early Checks failed for the next upgrade`
		`1440613691::Look at earlyChecks.log for more info`
		`1440613691::`
		`[admusr@exhrNO-mrsvnc-a ~]$`

Appendix I: Recovering from a Failed Upgrade

Step	Procedure	Result

14. ☐	**Failed Server (CLI):**
	If the **"earlyChecks.log"** file is identified as the source, look for the Errors contained in that file.
		`[admusr@exhrNO-mrsvnc-a upgrade]$ grep ERROR /var/TKLC/log/upgrade/earlyChecks.log`
		
		`ERROR: There are alarms on the system!`
		`ERROR: <<<  OUTPUT  >>>`
		`ERROR:  SEQ: 15 UPTIME: 2070747 BIRTH: 1438969736 TYPE: SET ALARM:`
		`TKSPLATMI10|tpdNTPDaemonNotSynchronizedWarning|1.3.6.1.4.1.323.5.3.18.3.1.3.10|32509|Communications|Communications Subsystem Failure`
		`ERROR: <<< END OUTPUT >>>`
		`ERROR: earlyUpgradeChecks() code failed for Upgrade::EarlyPolicy::TPDEarlyChecks`
		`ERROR: Failed running earlyUpgradeChecks() code`
		`ERROR: Early Upgrade Checks Failed!`
		`[admusr@exhrNO-mrsvnc-a upgrade]$`

- Although outside of the scope of this document, the user is expected to use standard troubleshooting techniques to clear the alarm condition from the Failed Server.
- If troubleshooting assistance is needed, refer to **Appendix J:** *Accessing My Oracle Support (MOS)* for information on contacting MOS.
- **DO NOT PROCEED TO STEP 15 OF THIS PROCEDURE UNTIL THE ALARM CONDITION HAS BEEN CLEARED!**

15. ☐	**Failed Server (CLI):** Use the **alarmMgr** utility to verify that all **Platform** alarms have been cleared from the system.	`[admusr@exhrNO-mrsvnc-b ~]$ alarmMgr -alarmStatus` `[admusr@exhrNO-mrsvnc-b ~]$`
16. ☐	**Failed Server (CLI):** Exit the **CLI** for the Failed Server.	`[admusr@exhrNO-mrsvnc-a ~]$ exit` `logout`
17. ☐	**Primary NOAM VIP (GUI):** Re-execute the Server Upgrade. **NOTE:** *Once failed, the Auto Server Group Upgrade (i.e.* ***Auto Upgrade****) option should not be repeated for that Server Group.*	• **Return to the referring Upgrade procedure and re-execute SW Upgrade for the Failed Server using the "Upgrade Server" option Only!**
THIS PROCEDURE HAS BEEN COMPLETED		

APPENDIX J. ACCESSING MY ORACLE SUPPORT (MOS)

My Oracle Support

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*. When calling, there are multiple layers of menus selections. Make the selections in the sequence shown below on the Support telephone menu:

1. For the first set of menu options, select 2, "New Service Request". You will hear another set of menu options.
2. In this set of menu options, select 3, "Hardware, Networking and Solaris Operating System Support". A third set of menu options begins.
3. In the third set of options, select 2, "Non-technical issue". Then you will be connected to a live agent who can assist you with MOS registration and provide Support Identifiers. Simply mention you are a Tekelec Customer new to MOS.

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

Emergency Response

In the event of a critical service situation, emergency response is offered by the CAS main number at **1-800-223-1711** (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at *http://www.oracle.com/us/support/contact/index.html*. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

Locate Product Documentation on the Oracle Help Center Site

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

1. Access the OHC site at http://docs.oracle.com.

2. Click **Industries**.

3. Under the Oracle Communications subheading, click the **Oracle Communications documentation** link.
   The Communications Documentation page appears. Most products covered by these documentation sets will appear under the headings “Network Session Delivery and Control Infrastructure” or “Platforms.”

4. Click the Product and then the Release Number. A list of the entire documentation set for the selected product and release appears.

5. To download a file to your location, right-click the PDF link, select **Save target as** (or similar command based on your browser), and save to a local folder.