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Migration Procedures

Policy Management 6.3 to 9.4 Migration Procedures

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CAUTION: Use only the upgrade procedure included in the Upgrade Kit.

Before upgrading any system, access the Oracle Customer Support site and review any Technical Service Bulletins (TSBs) that relate to this upgrade.

Refer to Appendix A, Accessing the Oracle customer support site, for instructions on accessing this site.

Contact My Oracle Support and inform them of your upgrade plans prior to beginning this or any upgrade procedure.

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Introduction

1.1 Purpose

The purpose of this document is to describe the procedures of migrating policy 6.3 to policy 9.4.

Policy 6.3 is a release for Cable products, which:

- Runs on legacy camiant platform
- Has been deployed on several rack mount systems, including PP5100, HP DL360G6 and HP DL360G7.
- Has several product types, including CMP, MA, MPE and BoD.

Policy 9.4 is the first cable release which runs on Tekelec Platform Distribution (TPD). It:

- Is based on Tekelec platform 6.0
- Is going to be deployed on HP ProLiant hardware. Including, DL360G6, DL360G7, HP DL380 Gen8.
- Has Policy application types: CMP, MA, MPE and BoD.

Due to the significant changes in OS & middleware/database for many of the Release 9.4 Cable components, including the transition to Tekelec Platform Distribution and COMCOL High Availability controls, Release 9.4 cannot be installed through a normal "software upgrade" process for deployed customers.

HA and data replication between policy 6.3 and 9.4 systems can not setup. 9.4 CMP cannot manage 6.3 MPEs and MAs. (MPE and MA can be displayed in 9.4 CMP in offline state, but 9.4 CMP cannot push/collect data from them). Therefore procedures must be defined to migrate the running 6.3 systems to 9.4 systems.

This document is intended for Policy Management engineering, integration, documentation, technical services, and test groups. This document may be used in discussions with the customer to determine if this product satisfies their expectations. The reader is assumed to be familiar with Cable policy products.

1.2 References

- *Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment*, GR-1089-CORE, Issue 1, Bellcore (November 1994).
- *Signaling Transfer Point Generic Requirements*, GR-82-CORE, Issue 1, (Bellcore), June 1994.
- *HP Solutions Firmware Upgrade Pack Release Notes*, 795-000-2xx
- *Policy Management Bare Metal Installation Guide*, Release 9.4, E85553-01

1.3 Acronyms

Acronym	Definition
AM	Application Manager
AF	Application Function
DPS	Downstream Policy Server
GUI	Graphical User Interface
SDM	Subscriber Data Management
HA	High Availability
BoD	Bandwidth On Demand
RMS	Rack Mount Server
TPD	Tekelec Platform Distribution
Comcol	Database product
CMP	The Configuration Management Platform: the Policy component responsible for

Acronym	Definition
	element management, configuration management, and other OAM functions.
MPE	Multimedia Policy Engine, the Policy component implementing the CableLabs PacketCable/PCMM Policy Server function.
MPE-R	An MPE configured in Stateless Routing mode and acting as a router to direct PCMM and Rx requests to downstream Policy Servers. A.k.a. “Tier-One” or “MPE-Routing”.
MPE-S	An MPE configured in Stateful Processing mode and acting as a Policy Server for PCMM and Rx requests to downstream Policy Servers. An MPE-S will be directly connected to some number of CMTS systems. A.k.a. “Tier-Two” or “MPE-Serving”.
MA	Management Agent: a Policy component responsible for network discovery functions using SNMP.
NE	Network Element, for cable customer, It is CMTS.

2.0 MIGRATION PROCEDURES

2.1 Installing and Migrating CMP

2.1.1 Preconditions

Customer must use two tiers topology. MPE-R must be in stateless mode. (Execute Policies for Routed Traffic=disable, MPE-R does not maintain PCMM session info. Route to Downstream Policy Servers using IP subnets=Enable, MPE-R does not maintain diameter session info.)

This migration procedure only supports in-service migration in this stateless mode. Otherwise, you cannot maintain the legacy Diameter/PCMM sessions on 6.3MPE.

2.1.2 Procedure 1: Installing Policy 9.4 CMP

Install a Policy 9.4 CMP cluster and do initial platform configuration, following the procedures described in Policy Management Bare Metal Installation Guide, Release 9.4.

The IP address of the newly installed Policy 9.4 CMP should be different from the existing Policy 6.3 CMP. The IP of the 6.3 CMP address must be accessible from the 9.4 CMP.

2.1.3 Procedure 2: Dumping and Importing Data from Policy 6.3 CMP to 9.4 CMP

On the console of the Active blade in the Policy 9.4 CMP, run the command:

```
/opt/camiant/mi/bin/mysql_migration_from_6_3.bash <cmp6.3_ip>
```

NOTE: This script does not support the rollback. Need to redo procedure 1 to clear the environment.

This command imports the MySQL database from policy 6.3 to 9.4 server. Customer may need to input the ssh passcode of 6.3CMP. After this command being executed successfully:

- NEs, Subnets, MAs, all MPEs are transferred to Policy 9.4 CMP.
- TrafficProfile/MediaProfile/Policy data are transferred to Policy 9.4 CMP too.
- Policy 6.3 MPE-R will be displayed on 9.4 CMP. Note that MPE-R6.3 info will be useless in the migration process, it will be removed in Procedure 14.
- Policy 6.3 MPE-R, MPE-S, MA are not manageable by 9.4 CMP. Cannot do any change to them. It will be displayed in off-line state (unmanaged) in 9.4 CMP.
- After this step, Policy 9.4 CMP has not taken effect, all 6.3 system including CMP (for example, schedule tasks) are working.

Open the GUI of the Policy 9.4 CMP to verify the configuration has been imported correctly.

Configure CMP topology, add server B topology to CMP cluster, now there will be active and standby servers.

Wait mysql sync finished between active and standby before continuing the next step. Use this method to check the sync state.

ssh to standby CMP server, input command:

```
wbAccess mysqlState
```

If `SLAVE_SYNCHRONIZED` is showing, the synchronization of the CMP MYsql data is complete.

It need to reset the mode, and check the BoD mode to manage the BoD server on 9.4 CMP.

2.1.4 Procedure 3: Clearing Force-Standby Flag on Standby 9.4 CMP

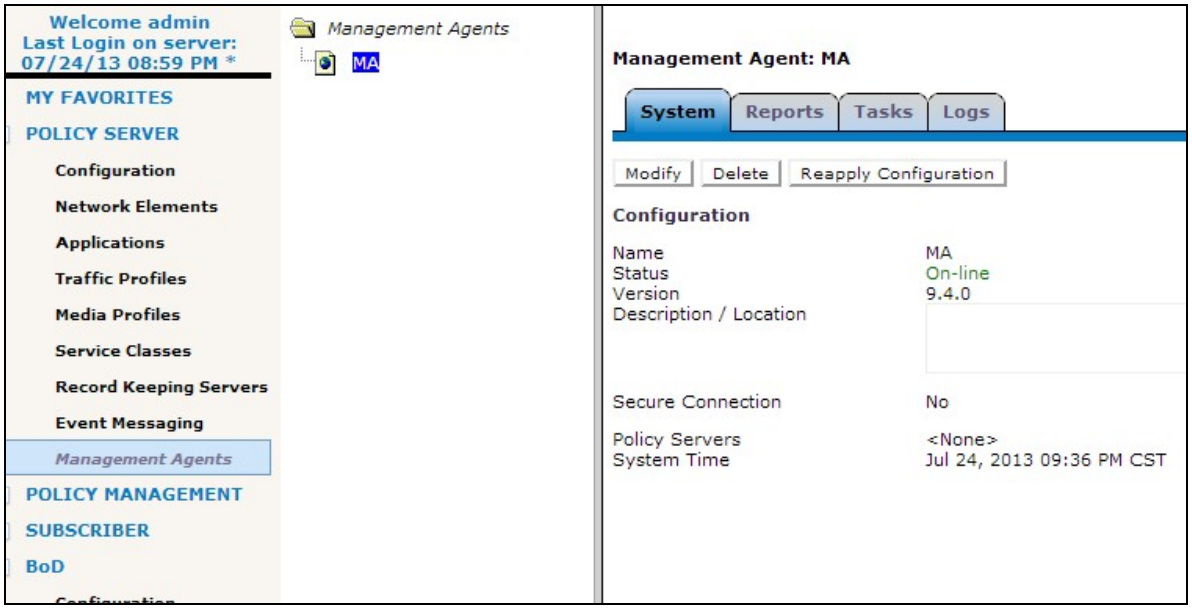
After the sync between active and standby finished, modify server B, uncheck the Forced Standby. Then HA between the CMP cluster will take effect.

2.2 Installing and Migrating MA

2.2.1 Procedure 4: Install Policy 9.4 MA

Install 9.4 MA cluster following procedures described in Policy Management Bare Metal Installation Guide, Release 9.4.

Open GUI of 9.4 CMP, add MA to topology and add MA server to system at Management Agents menu.



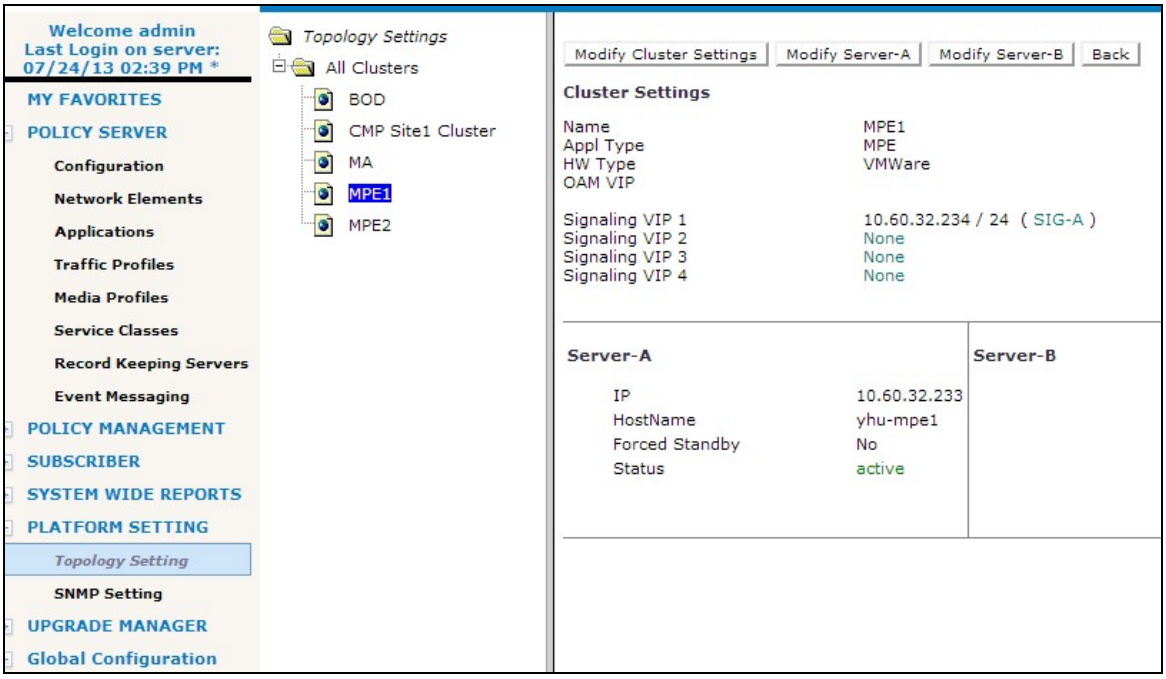
2.3 Installing and Migrating MPE-R

2.3.1 Procedure 5: Installing Policy 9.4 MPE-R

Install Policy 9.4 MPE-R using steps described in Policy Management Bare Metal Installation Guide for Release 9.4.

The Policy 9.4 MPE-R must uses different IP addresses from the existing 6.3 servers. The 6.3 MPE-R must be kept untill all the migration finished in order to rollback the bussiness service to 6.3 system if any error happened in the migration. (Customer situation may various based on the IPs allocation).

Open the GUI of the Policy 9.4 CMP, add the 9.4 MPE-R cluster to topology.



2.3.2 Procedure 6: Configuring Policy 9.4 MPE-R

The following configuration is intend to make 9.4 MPE-R take over the routing role from 6.3 MPE-R.

1. Configure 9.4 realm and identity for the MPE-R.
2. Modify Routing Configuration from CMP 9.4:
   - Execute Policies for Routed Traffic : disable
   - Route to Downstream Policy Servers using IP subnets: Enable
3. Add MPE-S6.3 to Policy 9.4 MPE-R DownStream Policy Server. See picture 2. The COPS connection and Rx connection will construct after this step. All the routing data, subnets info should be pushed to 9.4MPE-R correctly.
4. Use Rcmgr to check DPS data:

```
>/opt/camiant/rc/bin/rcmgr
RcMgr> show dps
```

   6.3 MPE-S can be displayed in DPS list.

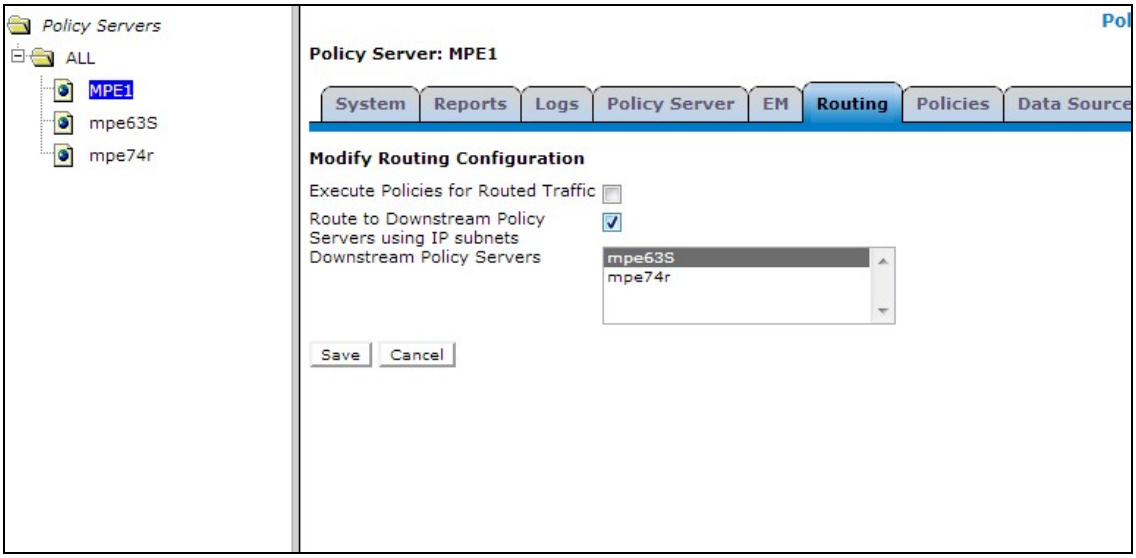
5. Use the `netstat` command to check the connection between 9.4 MPE-R and 6.3 MPE-S

```
> netstat -nalp | grep 3918
tcp        0      0 :::3918                     :::*                        LISTEN      2909/java
tcp        0      0 ::ffff:10.60.32.233:56591   ::ffff:10.60.24.87:3918     ESTABLISHED 2909/java
```

NOTES:

- Execute Policies for Routed Traffic=disable, MPE-R does not maintain PCMM session info.
- Route to Downstream Policy Servers using IP subnets=Enable, MPE-R does not maintain diameter session info.

This migration procedure only supports in-service migration in this statless mode. Otherwise, you cannot maintain the legacy Diameter/PCMM sessions on 6.3MPE.



2.3.3 Procedure 7: Enable 9.4 MA tasks to collect CMTS changes

1. Enable/Disable 9.4 MA scheduler tasks.
2. Remove the legacy 6.3 MA that legacy 6.3 MPE-S associated to, associate legacy 6.3 MPE-S to 9.4 MA.

   After this step, all the NEs(CMTS) that connected to legacy 6.3 MPE-S will be pushed to 9.4 MA, so MA subnets collector task can collect the subnets info from CMTS. CMP can also get these changes after tasks running. At last, the subnets will be pushed to 9.4 MPE-R by PCMM Routing Distribution task.

NOTE: 9.4 CMP and 9.4 MA cannot push the data to legacy 6.3 MPE-S, so need to let legacy 6.3 CMP and MA running at the same time, so that 6.3 MPE-S can get the subnets change also.

The tasks of 9.4 CMP/MA should be enabled as 6.3 CMP/MA did. If possible, please disable the subscriber collector/distributor tasks. In the 9.4 CMP and MA tasks running, there will be many error logs in engineering log, because 9.4 CMP/MA cannot connect to 6.3 MPE.

If you want to add/update subnets of CMTS manually, it has to do it at 6.3 CMP and 9.4 CMP both, and reapply the 9.4 MPE-R to make 9.4 MPE-R get the subnets change.

2.3.4 Procedure 8: Notifying AM/AF to Change Policy Server IP

After 9.4MPE-R is ready, it is able to modify the configuration of AM/AF, change policy server IP to 9.4MPE-R. After this change, AM/AF would connect to new 9.4MPE-R.

After this step, the traffic direction AM/AF---9.4MPE-R---6.3MPE-S---CMTS start to work. The legacy traffic flow

AM/AF---6.3MPE-R---6.3MPE-S---CMTS will stop.

- PCMM/Rx session which have been created through 6.3MPE-R:
  - AM/AF send out request for delete/modify PCMM session to 9.4 MPE-R, the session will be deleted/modified from CMTS and 6.3 MPE-S. Because gatedelete/gateset for modification message include subscriberid, so it can be routed to 6.3 MPE-S, processed in CMTS.
  - AM/AF send out request to delete/modify diameter session to 9.4 MPE-R, the session will be deleted/ modified in CMTS and 6.3 MPE-S. Because Rx STR/AAR update message include desthost which points to 6.3 MPE-S even without subip info, so the message can be routed to 6.3 MPE-S.
- New PCMM/Rx sessions from 9.4 MPE-R to 6.3 MPE-S can be created/deleted/modified successfully.

Now all the traffic has been moved to 9.4 MPE-R.

NOTE: Do not make any changes to legacy 6.3CMP and 6.3MPE-R, in case of any failure in the migration, it is able to rollback the traffic to 6.3 legacy system.

2.4 Installing and Migrating MPE-S

2.4.1 Procedure 9: Installing Policy 9.4 MPE-S

Install 9.4 MPE-S clusters following procedures described in Policy Management Bare Metal Installation Guide, Release 9.4.

Open GUI of 9.4 CMP, add MPE-S clusters to topology.

2.4.2 Procedure 10: Configuring Policy 9.4 MPE-S

Configure Realm and Identity, associate 9.4 MPE-S with 9.4 MA.

2.4.3 Procedure 11: Verifying Policy 9.4 CMP can Apply Policies to Policy 9.4 MPE-S

Assign policy and TrafficProfile to 9.4 MPE-S.

2.4.4 Procedure 12: Associate Policy 9.4 MPE-S to Policy 9.4 MPE-R

Add 9.4 MPE-S as the downstream server of 9.4 MPE-R. It is similar with procedure 6.

Associate CMTS with 9.4 MPE-S, un-associate CMTS with 6.3MPE-S. (Create a new group, add CMTS to this new group, remove the legacy group is a easy way to change the association with MPE). After CMTS associated with 9.4 MPE-S, the COPS connection would be created.

Verify the TCP/IP connection between 9.4 MPE-S and CMTS. Run this command line on 9.4 MPE-S.

```
> netstat -nalp | grep 3918
tcp        0      0 :::3918                     :::*                        LISTEN      2909/java
tcp        0      0 ::ffff:10.60.32.233:56591   ::ffff:10.60.24.87:3918     ESTABLISHED 2909/java
```

Now the 6.3 MPE-S and 9.4 MPE-S are both downstream policy servers of 9.4 MPE-R. At this time, the two downstream policy servers can be available at the same time, but only the DPS of 9.4 MPE-S has the subnets info.

NOTE: Please perform this step when the PCMM/Diameter active session count on 6.3 MPE-S is in low level. This step May cause data loss!

It is not able to manage the association from 6.3 MPE-S tab on 9.4 CMP, there will be exception thrown. Remove legacy group can un-associate the CMTS to 6.3 MPE-S.

The two traffic directions:

AM/AF---9.4 MPE-R---MPE-S6.3---CMTS ---still working for old Rx session modify/delete requests.

AM/AF---9.4 MPE-R---MPE-S9.4---CMTS ---start to take over all the new Rx create requests and all PCMM requests.

- PCMM/Rx session which created at 6.3 MPE-R.
    - AM/AF send out delete/update PCMM session request to 9.4 MPE-R, The request will be routed to 9.4MPE-S, and 9.4 MPE-S forward these requests to CMTS, the session can be deleted/updated at CMTS, but PCMM session info will still exist at MPE-S6.3. AM/AF---9.4MPE-R---9.4MPE-S---CMTS works for modify/delete PCMM requests.
    - AF/AM send out delete/update diameter session request to 9.4MPE-R, the session will be deleted/updated in CMTS and 6.3MPE-S. Because Rx STR and AAR update message includes desthost which points to 6.3MPE-S even without subip info, so the message can be routed to MPE-S6.3, since CMP9.4 cannot push CMTS association change to 6.3MPE-S, so 6.3MPE-S still has the connection with CMTS. AF---MPE-9.4R---6.3MPE-S---CMTS works for update/delete diameter Rx requests.
- New PCMM/Rx session from 9.4 MPE-R to 9.4 MPE-S can be created/deleted/modified successfully. AM/AF---MPE-9.4R---9.4MPE-S---CMTS works for all the new created sessions.

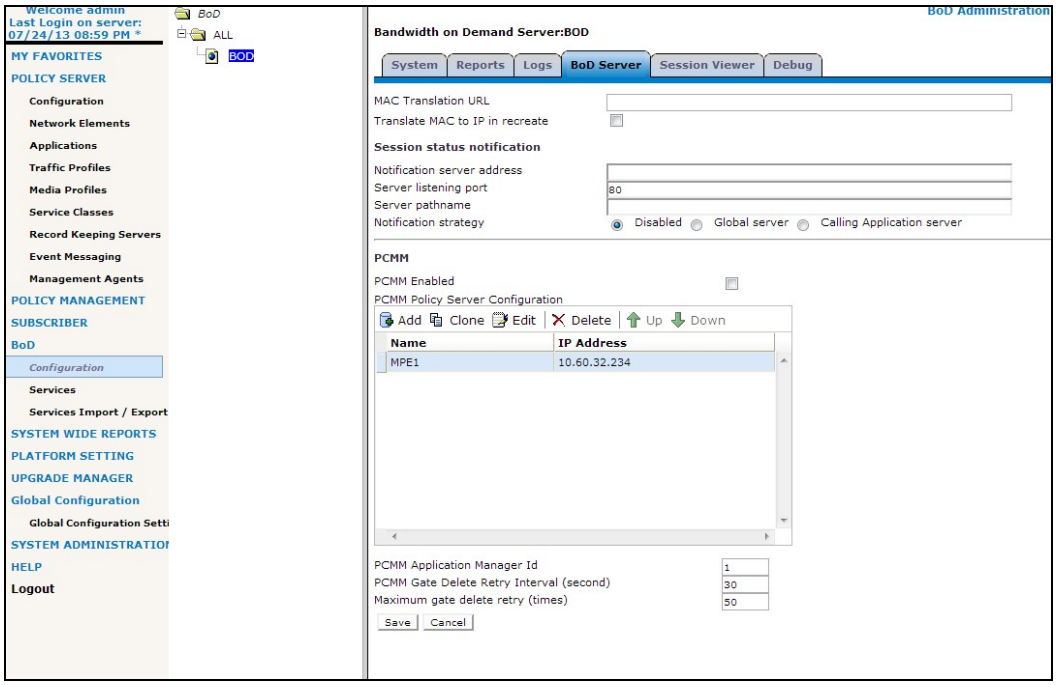
2.5 Installing BoD

2.5.1 Procedure 13: Installing BoD

1. Install 9.4BoD, configure BoD server setting.
2. Export 6.3 BoD service, and import to 9.4 BoD on 9.4 CMP GUI.

   If the IP address for the BoD AM changed, notify the calling application which sends the HTTP/SOAP requests to the new 9.4 BoD AM.

   It is recommended to perform this step when BoD session is slow. Because 9.4 BoD does not have 6.3 BoD sessions. Handling old sessions (modify or delete) created in 6.3 BoD will fail.



2.6 Removing 6.3 MA and MPE servers

2.6.1 Procedure 14: Removing 6.3 MA and MPE Servers

1. When there is no diameter sessions or very few sessions on 6.3 MPE-S, remove the association between 6.3MPE-S and the 9.4 MPE-R and 9.4 MA.
2. Remove the 6.3 MPE-R, MPE-S (The traffic has been taken out) from 9.4 CMP GUI. The 6.3 CMP, MPE-R, MPE-S, MA, and BoD can be powered off or reinstall 9.4 products.
3. Repeat procedure 7 – 13, install new 9.4 MPE-S/MA/BoD to replace legacy 6.3 MPE-S/MA/BoD. So the rest of the pre-existing individual clusters can be reinstalled sequentially as Release 9.4 products.

NOTE: After this step, 6.3 systems cannot be rollback. Need to make sure 9.4 systems running smoothly without fatal error, then reinstall 6.3 servers to 9.4 products.

2.7 Support rollback

2.7.1 CMP rollback

Since there is no change to 6.3 CMP, 6.3 CMP can be back online and in-service at any time before procedure 14.

2.7.2 MPE rollback

Precondition: 6.3 CMP is fully operational and in-service.

1. Make sure the configuration of 6.3 MPE-R and MPE-S was not changed in this migration window.
2. Redirect AM/AF to 6.3 MPE-R.

Now 6.3 MPEs should be fully operational and in-service.

NOTE: 6.3MPE-R cannot connect to 9.4 MPE-S, so the diameter sessions created in this migration window through 9.4 MPE-R cannot be deleted/modified.

APPENDIX A. ACCESSING THE ORACLE CUSTOMER SUPPORT SITE

Access to the Oracle Customer Support site is restricted to current Oracle customers only. This section describes how to log into the Oracle Customer Support site and link to Oracle Support Hotlines

1. Log into Oracle Customer Support site at https://support.oracle.com
2. Refer Oracle Support Hotlines http://www.oracle.com/us/support/contact/index.html and http://www.oracle.com/us/corporate/acquisitions/tekelec/support/index.html