Oracle® Communications Performance Intelligence Center

Installation Guide

Release 10.2

E60675 Revision 5

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ORACLE®

Oracle Communications Performance Intelligence Center Installation Guide, Release 10.2

CAUTION: Use only the guide downloaded from the Oracle Help Center (OHC) (http://docs.oracle.com/en/industries/communications/).
Before upgrading your system, access the My Oracle Support web portal (https://support.oracle.com) and review any Knowledge Alerts that may be related to the System Health Check or the Upgrade.

Before beginning this procedure, contact My Oracle Support and inform them of your upgrade plans.

Refer to APPENDIX: My Oracle Support (MOS) for instructions on accessing My Oracle Support

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1 INTRODUCTION

1.1 Document Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1. Admonishments

	DANGER: (This icon and text indicate the possibility of personal injury.)
	WARNING: (This icon and text indicate the possibility of equipment damage.)
	CAUTION: (This icon and text indicate the possibility of service interruption.)

1.2 Reference Documents

[1] Platform Configuration Procedure References Tekelec Platform release 7.3

[2] TPD Initial Product Manufacturing Tekelec Platform release 7.3
[3] HP Solutions Firmware Upgrade Pack 2.2.9, E64917-02, October 2015
[4] Oracle Firmware Upgrade Pack, E54964, June 2014
[5] ODA Getting Started Guide, E22692-41, February 2015
[6] Oracle Database Appliance - 12.1.2 and 2.X Supported ODA Versions & Known Issues (Doc ID 888888.1)
[7] ZFS Storage Appliance Installation Guide, E55847-01, December 2014
[8] ZFS Storage Appliance Administration Guide, E55851-01, December 2014
[9] Tekelec OTN
[10] PIC 10.2 Maintenance Guide, E60679
[11] Teklec Default Passwords ,TR006061
[12] PIC Hardware installation Guidelines, E66862
[13] PIC 10.2 Security Guide, E66847
[14] PIC Data WareHouse Server (DWS) Installation, Doc ID 2028670.1
[15] PIC Packet Data Unit Storage (PDU) Server Installation, Doc ID 2034894.1
[16] PIC Management Server Installation, Doc ID 2062544.1
[17] PIC 10.2 Quick Start Guide
[18] MOS Information Center: Upgrade Oracle Communications Performance Intelligence Center 1984685.2
[19] MOS Information Center:Installation & Configuration for Oracle Java SE 1412103.2
[20] PIC 10.2 Centralized Configuration Manager Administrator Guide, E66853
[21] Capacity management good practices Doc ID 1683859.2
[22] Oracle linux on Third-Party Server Installation Doc ID 2061666.1
[23] Oracle ASM and database on Thrid-Party Server Installation Doc ID 2062491.1

1.3 Related Publications

For information about additional publications that are related to this document, refer to the Release Notice document. The Release Notice document is published as a part of the Release Documentation and is also published as a separate document on the Oracle Technology Network Site.

1.4 Scope And Audience

This document describes the procedures to install a OCPIC system at Release 10.2.

This document is intended for use by trained engineers in software installation on both SUN and HP hardware. A working-level understanding of Linux, Oracle Database and command line interface is expected to successfully use this document.

It is strongly recommended that prior to performing an installation of the operating system and applications software, on either a HP or ODA system, the user read through this document.

Note: The procedures in this document are not necessarily in a sequential order. There are flow diagrams in the Installation Overview chapter that provide the sequence of the procedures for each component of this OCPIC system. Each procedure describes a discrete action. It is expected that the individuals responsible for installing the system should reference these flow diagrams during this installation process.

1.5 Requirements and Prerequisites

1.5.1 Hardware Requirements

Refer document PIC Hardware Guidelines docID E66862 (see chapter Reference Documents).

1.5.2 Software Requirements

The following software is required for the release 10.2 installation. The engineers must look on the latest patch available on MOS rather than using the GA release. The recommended patch will be available on MOS Information Center.

Oracle Communication GBU deliverables:

- Management Server
- Mediation Server
- Mediation Protocol
- Acquistion Probed and Integration
- TADAPT
- TPD
- Oracle Linux 7 for x86_64 bit

All the software must be downloaded from Oracle Software Delivery Cloud (OSDC).

https://edelivery.oracle.com/

- Other required Oracle GA deliverables can be downloaded from Oracle web site:Oracle WebLogic Server 11gR1 (10.3.6) Generic and CoherenceWebLogic 10.3.6.0
    - wls1036_generic.jar

  https://edelivery.oracle.com/EPD/Download/get_form?egroup_aru_number=11571971

    - JDK7: From the below URL, select *latest **JDK/JRE 7** update*

  https://support.oracle.com/epmos/faces/DocumentDisplay?id=1412103.2

Note: Document (1412103.2) might get new updates without notice, so it is advisable to download and use the latest JDK/JRE7 update.

Other required Oracle database patchset 13390677 deliverables can be downloaded from MOS Information Center:

- Oracle Database 11.2.0.4 64bits product patchset
    - p13390677_112040_Linux-x86-64_1of7.zip
    - p13390677_112040_Linux-x86-64_2of7.zip
    - p13390677_112040_Linux-x86-64_3of7.zip

Note: In case the latest patch need to be applied then it can be downloaded and applied from MOS Information Center "p18370031_112040_Linux-x86-64.zip"

In case of engineered system like ODA and ZFS, software can be downloaded and installed using information provided below:

- ODA
    - MOS Oracle Database Appliance - 12.1.2 and 2.X Supported ODA Versions & Known Issues (Doc ID 888888.1)
- ZFS
    - ZFS refer to MOS Oracle Support Document 2021771.1 (Oracle ZFS Storage Appliance: Software Updates)

2 INSTALLATION OVERVIEW

This section provides installation overview information for the release by using flowcharts that depict the sequence of procedures for each subsystem and their associated servers.

2.1 Functional overview

OCPIC provides the following main functions on defined hardware with all details in the document PIC Hardware Guidelines docID E66862 (see chapter Reference Documents)

The main possibilities and constraints are depicted here:

1) Management Server:

- Can be deployed on Oracle Linux 7.1 based server and can be shared with a Data Record Storage and/or a PDU Storage.
- No installation supported on ODA

2) Data Record Storage:

- Can be deployed on Oracle Linux 7.1 based server and can be shared with a Management Server and/or a PDU Storage.
- Can be deployed on Oracle Database Appliance and shared with a PDU Storage
- Note: Data Record Storage (DRS) in this document can be referenced by “DWS” in some command lines.

3) PDU Storage:

- Can be deployed on Oracle Linux 7.1 based server and can be shared with a Management Server and/or a Data Record Storage.
- Can be deployed on Oracle Database Appliance and can be shared with a Data Record Storage.
- Can be deployed on Oracle ZFS engineered system (ZS3-2 and above)

4) Acquisition and Mediation:

- Can be deployed on TPD based server or Virtual machine
- Multiple Mediation and Probed Acquisition virtual machines can be hosted on the same server. Each Probed Acquisition virtual machine has exclusive usage of its own Acquisition card.
- Note: Mediation in this document can be refenced by “IXP” in some command lines.

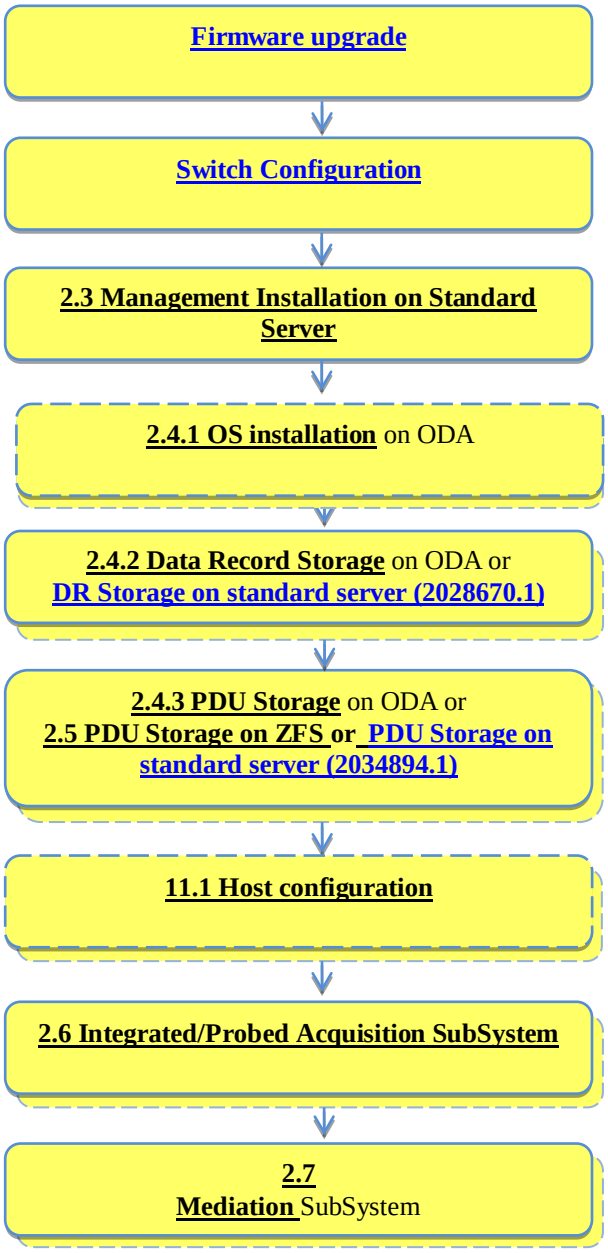
2.2 High Level Manufacturing

This flowchart describes high-level manufacturing installation overview.

Mediation/Management/Data Record Storage/Acquisition components can be installed in parallel, however the integration of the OCPIC components require that management server is already present.Therefore it is recommended to follow the sequence depicted in below flow chart. Referring to graphic below, the hardware applicable to each component is identified and for each component,the applicable flowchart is identified by section of this document where it is located.

Note: execute each of the following high-level installation steps in the order shown in the diagram. Some of the steps can be ignored because the relevant H/W is not used (dotted boxes); some might be done several times because the relevant H/W is there multiple times (stacked boxes).

Figure 1. High level installation



2.3 Management Server Installation and Post Installation

Refer to **Management on standard server (2062544.1)** for the installation

The next chapters are describing the post installation.

2.3.1 Change Customer Icon (Optional)

This procedure describes how to change the customer icon (for example, replace the standard Tekelec logo with a customer logo). This procedure is optional.

1. Open a terminal window and log in as oracle on both Management servers MS1 and MS2.
2. Copy the customer icon file (customer_icon.jpg) to the /opt/www/nsp/resources directory of each server.
3. Verify the customer icon properties:

   The file name must be customer_icon.jpg.

   The file must belong to user oracle in group oinstall.

   The compression format must be Jpeg.

   Optimum width/height ratio is 1.25.

   Any image can be used; the suggested minimum width/height is 150 pixels.

2.3.2 Install Optional Applications

This procedure describes how to install optional applications.

2.3.2.1 Applications list

- L99465 PIC Mediation DataFeed.sh
- L99467 PIC Multiprotocol Troubleshooting Application.sh
- L99468 PIC Network and Service Alarm Applications.sh
- L99469 PIC Network and Service Dashboard.sh
- L99470 PIC SS7 Network Surveillance Applications.sh
- L99471 On Demand User Plane Capture Application.sh
- Session Point Code

2.3.2.2 Applications installation

1. Open a terminal window and log in as tekelec on the Management Admin server.
2. Change dir to `/opt/nsp/nsp-package/framework/install/dist/install/optional/exec` folder
3. Install the required optional application by running the corresponding executable for that application.

   For example : To install optional application “PIC Network and Service Dashboard.sh“ type the name of script “sh L99469_PIC_Network_and_Service_Dashboard.sh” and hit enter command
4. The install logs are available at /var/log/nsp/install/activate_optional.log.

2.3.3 Configure Purchased Users

This procedure describes how to increase purchased token after NSP is installed

1. Open a terminal window and log in as tekelec on the Management server.
2. Change dir to `/opt/nsp/nsp-package/framework/install/dist/install/optional/exec` folder
3. Run the script "sh L99466_PIC_Management_Application.sh" provided. It will prompt for number of concurrent user (The number of users sold for). Enter the value.
   Note: Number of users cannot be decreased. Value can be increased only.Maximum value can be 50 only.
4. After the value provided it will successfully increase the token.

2.3.4 Management Server Post Install Health Check

1. Open a terminal window and log in as root on the Management Server.

2. Review the Management Server installation logs (/var/log/nsp/install/nsp_install.log).

3. Log on to weblogic console and Verify the following:

   - All servers are in running and in OK state
   - Oracle em console connectivity is OK
   - Application deployments are in Active and OK state.

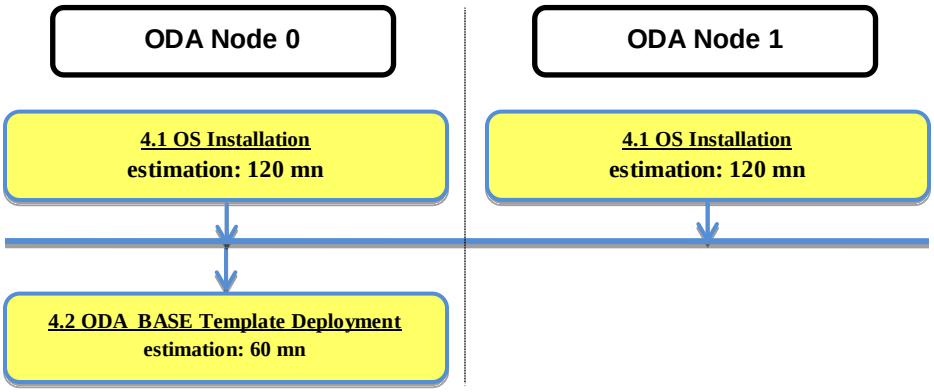
4. Execute from PIC 10.2 Maintenance Guide doc ID E60679 section 12.5.1 **"Revoke DBA Role from "nsp" user"**

2.4 Oracle Database Appliance

2.4.1 OS installation

This flowchart depicts the sequence of procedures that must be executed to prepare the Oracle Database Appliance. The OS installation must be done on both physical nodes on ODA.

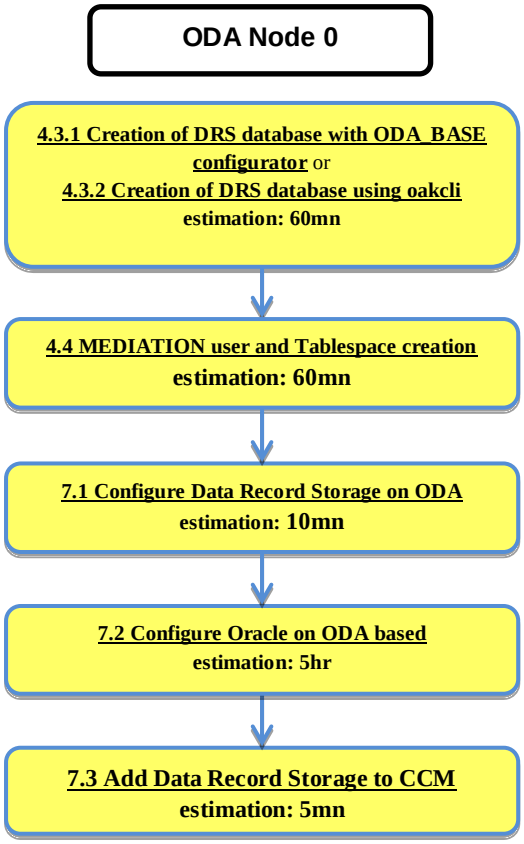
Figure 2. Preparation of Oracle Database Appliance



2.4.2 Data Record Storage

This flowchart depicts the sequence of procedures that must be executed to install the data record storage on ODA.

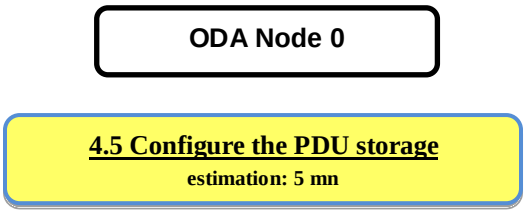
Figure 3. Data Record Storage installation on ODA server



2.4.3 PDU Storage

This flowchart depicts the sequence of procedures that must be executed to install the protocol data unit storage on ODA.

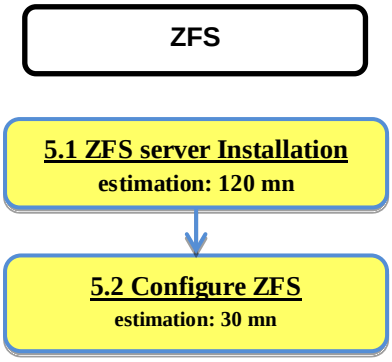
Figure 4. Protocol Data Unit Storage installation on ODA server



2.5 PDU Storage on ZFS

This flowchart depicts the sequence of procedures that must be executed to prepare the ZFS.

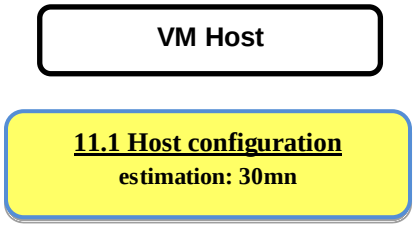
Figure 5. Preparation of ZFS



2.6 Host for virtual machines

This flowchart depicts the sequence of procedures that must be executed to prepare a host to receive Probed Acquisition and/or Mediation servers.

Figure 6. Preparation of VM host

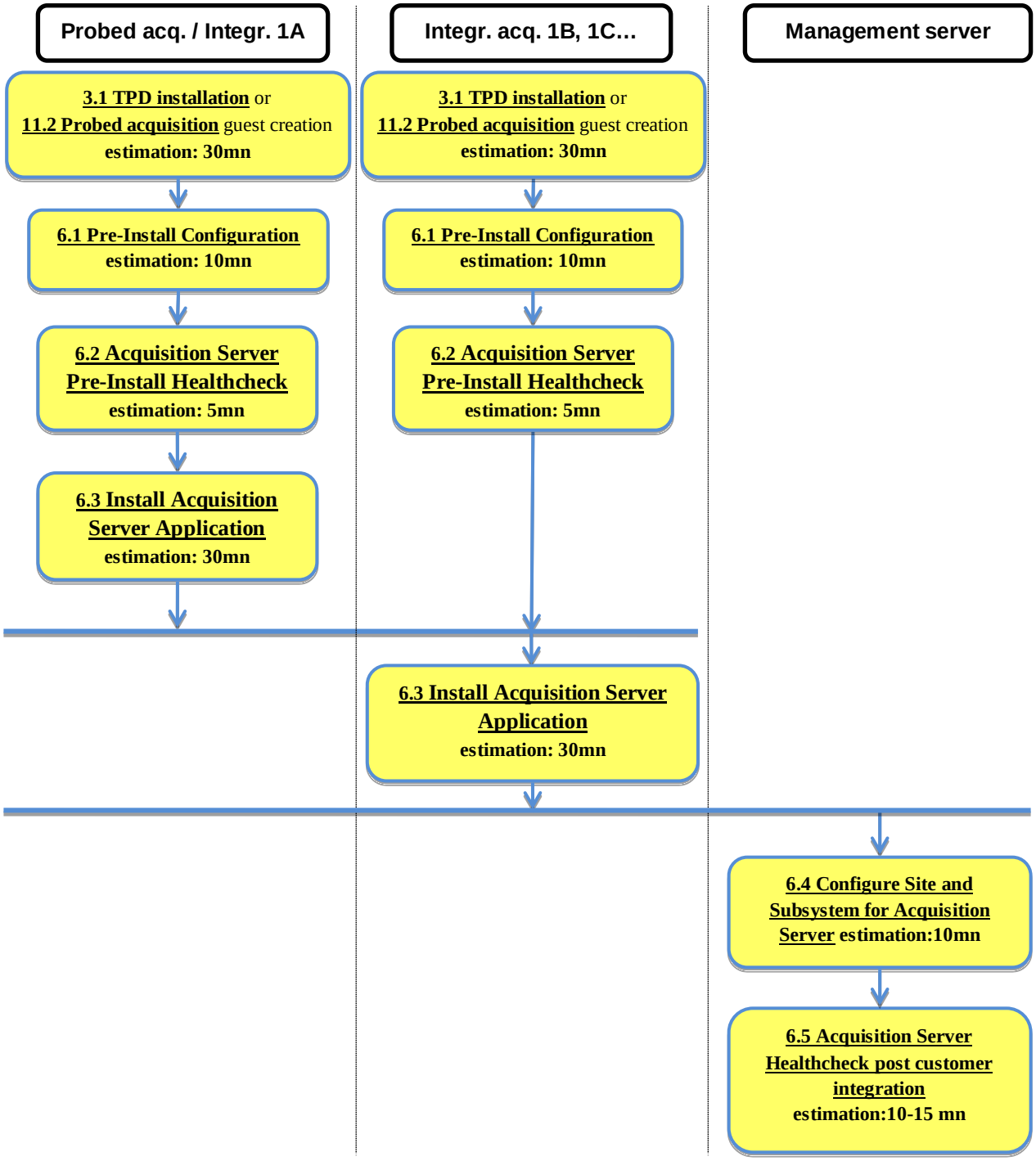


2.7 Integrated/Probed Acquisition SubSystem

This flowchart depicts the sequence of procedures that must be executed to install the integrated/probed acquisition subsystem and associated servers.

- IPM sequence is not required for E5-APP-B as E5-APP-B card is provided with already installed TPD.
- For Probed acquisition the installation is always done on the stand alone server.

Figure 7. Integrated and Probed Acquisition SubSystem Installation

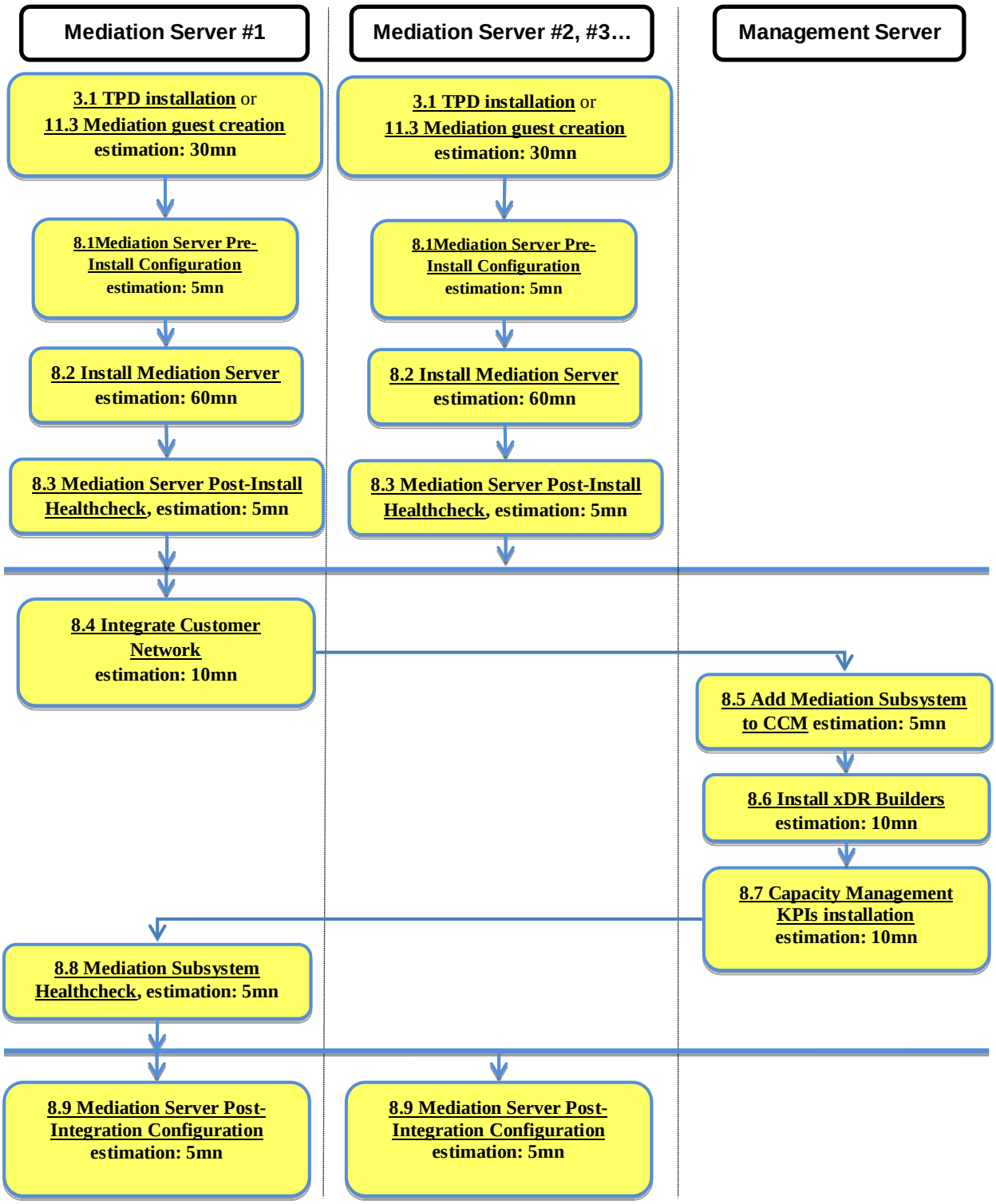


2.8 Mediation SubSystem

This flowchart depicts the sequence of procedures that must be executed to install the mediation subsystem and associated servers. The Mediation subsystem consists of the following types of servers:

- Mediation Base server

Figure 8. Mediation subsystem installation



3 SYSTEM CONFIGURATION ON TPD HARDWARE

This section provides instructions for installing the operating system on the TPD servers, and doing some basic configuration before installing applications.

3.1 TPD installation

Please follow instructions for OS installation from Platform IPM Procedures, Tekelec Platform:

- Release 7.3.x, for Acquisition and Mediation subsystems
- Release 7.0.x, for the Management server

Supported TPD Hardware	Recommended Command	Comments
HP G6	TPDnoraid console=tty0	
HP Gen8	TPDnoraid console=tty0	
HP Gen9	TPDnoraid console=tty0	
X5-2, X6-2	TPDnoraid console=tty0	
E5-APP-B	TPDlvm	This command is to be used for a fresh installation on a new hardware, never used before for any purpose.
	TPDlvm scrub	Use this command for a major upgrade and when there was an application already installed. **Note**: If the error message “The IPM FAILED on this server. Run verifyIPM for details” shows up on the console, until the bug 24841996 (and the related bug 24842022) is fixed, it is required to IPM the server again with the command TPDlvm (without scrub).

4 SYSTEM CONFIGURATION ON ODA

This section provides the procedures for initializing the ODA in case of ODA hardware. The general installation and administration instructions have been provided in http://docs.oracle.com/cd/E22693_01/doc.12/e22692/toc.htm .

4.1 OS Installation

ODA must be installed (OS installation) with virtualized image support. Please refer document

https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1520579.1

for the OS installation in virtual platform mode. The user can follow the "Step by Step Instructions" link to perform the OS installation with virtualized platform support.

Warning: The fully qualified hostnames on ODA VMs must not exceed 30 characters. The fully qualified name is the machine name appended by domain name, for example "oda-ent-mlh1.fr.oracle.com", here "oda-ent-mlh1" is the name given to the machine and "fr.oracle.com" is the domain name. Care must be taken while defning domain name and machine host name to ensure above limit is respected.

4.1.1 Configure Network

Configuring network on dom0 for both nodes. Refer the steps in http://docs.oracle.com/cd/E22693_01/doc.12/e22692/predeploy.htm#CMTIG298

4.2 ODA_BASE Template Deployment

This refers to creating the ODA_BASE VM on both the nodes. Please refer steps in http://docs.oracle.com/cd/E22693_01/doc.12/e22692/deploy.htm#CMTIG142

Recommendations:

a) Select 12 cores of CPU and 192 GB of RAM

b) OCPIC does not need any additional VLANS, so creation of additional VLANs can be skipped

4.3 Creation of Database

4.3.1 Creation of DRS database with ODA_BASE configurator

Note: Only one database can be created using Oracle database manager configurator. If one database has been created using configurator then another database will be created using oakcli command line utility as explained in following sections.

Note: The partition " /cloudfs" can be used for the external storage either for example PDU storage for small OCPIC system using NFSv4. The size of this partition must be provided keeping external storage usage point in mind.

This refers to the creation of the Oracle database server on the ODA_BASE. Please refer the steps in http://docs.oracle.com/cd/E22693_01/doc.12/e22692/deploy.htm#CMTIG142

Requirement:

- Database Deployment: Oracle Enterprise Edition 11g

Recommendations for DRS:

- *Disk Group Redundancy: Normal*
- *Database Backup: External Backup*
- *Database Name: IXP0*
- *Is Container Database: false*
- *Database Type: Default (OLTP)*
- *Database Class: Large Database (template odb-12 , SGA 48GB, 12 CPU cores)*
- *Database Deployment : Enterprise Edition*
- *Data File Size (GB) : Not needed, if Container Database option is false.*
- *Data Files on Flash Storage: false*
- *Database Language: American*
- *DB Block Size : 16384 bytes*
- *Database Charset: AL32UTF8*
- *Database Territory: AMERICA*
- *National Charset: AL16UTF16*
- "*/cloudfs*" *partition with default size (50GB)*

Note: ODA is evolving independly of OCPIC Releases and could ask for other parameters. A previous version of this software configuration was asking for a "Configure DB Console" where the recommendation response for OCPIC was "Yes". Please refer to the ODA documentation in case of changes.

4.3.2 Creation of DRS database using oakcli

Note: Please see the recommendations in sec 4.3 before creating the database.

The steps mentioned in section 4.3.1 are applicable only if mediation server database is not created during the ODA_BASE deployment. The steps are especially useful for small system, where many database are needed.

a) Log on to oracle box as root user and run following command from home directory of root user:

```
# oakcli show databases
```

Similar kind of output will be shown on the screen:

```
[root@oda-ent-mlh1 ~]# oakcli show databases
DatabaseName DatabaseType DatabaseHomeName DatabaseHomeLocation DatabaseVersion
---------------- ----------- ----------------  ---------------------------------
NSP SINGLE OraDb11204_home3 /u01/app/oracle/product/11.2.0.4/dbhome_3   11.2.0.4.2(18031668,18031740)
```

It should show the database list. If the database IXP doesn't exists, then create database as mentioned in next step.

b) DRS requires Oracle 11g Enterprise Edition, large database with Database Block Size 16384 bytes. There is no constraint on database name, however it is recommended to use "IXP1" for

the DRS database name, remember that it was recommended above to choose IXP0 for the first DRS:

Creating the database using command line takes default Database Block Size of 8192 bytes. To create a database having Database Block Size of 16384 bytes requires a custom response file. The custom response file can be created using the following command:

```
# oakcli create db_config_params -conf <response_file_name>
```

Follow the following example.

```
[root@oda-ent-mlh1 ~]# oakcli create db_config_params -conf rsFileForDWS
Please select one of the following for Database Block Size  [1 .. 4]:
1    => 4096
2    => 8192
3    => 16384
4    => 32768
3
Selected value is: 16384

Specify the  Database Language (1. AMERICAN 2. Others) [1]:1
Selected value is: AMERICAN

Specify the  Database Characterset (1. AL32UTF8 2. Others) [1]:1
Selected value is: AL32UTF8

Specify the  Database Territory (1. AMERICA 2. Others) [1]:1
Selected value is: AMERICA

Specify the Component Language (1. en 2. Others) [1]:1
Selected value is: en

Successfully generated the Database parameter file 'rsFileForDWS'
[root@oda-ent-mlh1 ~]#
```

c) After creating the response file **create Enterprise Edition, large database with external storage and normal redundancy** with following command:

```
# oakcli create database -db <db_name> -params <response_file_name>
```

Where, <db_name> is the name of database “IXP1” and <response_file_name> is the name of response file created in the previous step.

Select the node to create database as node 1.

Provide the password same as default root user password on ODA whenever it prompts for password.

4.4 MEDIATION user and Tablespace creation

Perform below procedures only if IXP user and tablespaces don’t exist. In case they exists don’t perform below steps and move directly to section 4.5.

4.4.1 REDO log and UNDO tablespace configuration

Note: Before creation of user and tablespaces make sure the REDO logs and UNDO tablespace are available with following recommendations:

1. REDO Logs: 4 REDO log file size of 20 GB each.
2. UNDO tablespace: 4 files with maximum size of the file 64GB auto extending by 5 MB.

4.4.1.1 Configure REDO logs

REDO Logs: 4 REDO log file size of 20 GB each. If not then execute following procedure :

Note: Replace IXP in export command by the accurate name choosen during the creation of each instance (IXP0 or IXP1)

1. Log into the database as SYS user.

```
#su - oracle
# export ORACLE_SID=IXP
# ORAENV_ASK=NO source oraenv
# sqlplus / as sysdba
```

2. `sql> SELECT GROUP#, BYTES, STATUS from v$log;`

   The above command lists the REDO log groups number, size(in bytes) and status. Check the groups and size of log files. If the size of the log file is less than 20G then it should be replaced with a new logfile of size 20G. If the count of logfile is less than 4 then additional logfile should be created.

- A redo log file size cannot be altered.
- Also, At any time there should be minimum of 2 REDO log files present in the database.
- If there exists 2 REDO logfile and one is to be dropped then create a new logfile and then delete the existing one(i.e. we just cannot delete all the existing REDO log file and create new).
- A REDO log file with status 'ACTIVE' or 'CURRENT' cannot be deleted.
- To delete a logfile with status ‘CURRENT’, first switch to another log file.
- To delete a logfile with status ‘ACTIVE’ change the status of the logfiles to ‘INACTIVE’.

3. Following command Switch between log files and changes their status

```
sql> ALTER SYSTEM SWITCH LOGFILE;
```

   In large database on ODA server there are by default 3 log groups(1, 2 and 3) of size 4G each. Keep switching between the log files with above provided command till the status of log group 1 becomes 'CURRENT';

4. After log group status becomes 'CURRENT', if the status of the log groups 3 is not 'INACTIVE' then issue following command:

```
sql> ALTER SYSTEM CHECKPOINT;
```

5. Delete the log group 3 with following command:

```
sql> ALTER DATABASE DROP LOGFILE GROUP 3;
```

6. Recreate log group 3 with increased size with following command:

```
sql> ALTER DATABASE ADD LOGFILE GROUP 3 SIZE 20G;
```

7. Create another log group 4 using following command:

```
sql> ALTER DATABASE ADD LOGFILE GROUP 4 SIZE 20G;
```

8. Make log group 3 or 4 current by switching between the log files with command in **step3** till the status of any of log group 3 or 4 becomes 'CURRENT'.

9. After switching to log group 3 or 4, if the status of the log groups 1 and 2 is not 'INACTIVE' then issue following command:

```
sql> ALTER SYSTEM CHECKPOINT;
```

10. Delete the log groups 1 and 2 with following command:

```
sql> ALTER DATABASE DROP LOGFILE GROUP 1;
sql> ALTER DATABASE DROP LOGFILE GROUP 2;
```

11. Recreate the log groups 1 and 2 with following command:

```
sql> ALTER DATABASE ADD LOGFILE GROUP 1 SIZE 20G;
sql> ALTER DATABASE ADD LOGFILE GROUP 2 SIZE 20G;
```

4.4.1.2 Configure datafile in UNDO tablespace

For a large database, It is suggested to have 4 datafiles of size 50GB each extendable upto 64GB auto extending by 5 MB. On ODA the datafile size can be maximum upto 65535MB, which is 1MB less than 64 GB. If not then execute following procedure.

Note: Replace IXP in the export command by the accurate name choosen during the creation of each instance (IXP0 or IXP1)

1. Log into the database as SYS user.

```
#su - oracle
# export ORACLE_SID=IXP
# ORAENV_ASK=NO source oraenv
# sqlplus / as sysdba
```

2. List the datafiles in UNDO tablespace using following command:

```
sql> select FILE_NAME, AUTOEXTENSIBLE, MAXBYTES, MAXBLOCKS, INCREMENT_BY
from dba_data_files where TABLESPACE_NAME like 'UNDO%';
```

Verify the number of datafiles in UNDO tablespace and their size from the output of above command.

If the MAXBYTES is less than 65535MB then use the following command to alter the size:

```
sql> ALTER DATABASE DATAFILE <UNDO_datafile_name> AUTOEXTEND ON NEXT 5M
MAXSIZE 65535M;
```

where, <UNDO_datafile_name> is the name of datafile which is to be altered.

Example:

```
sql> ALTER DATABASE DATAFILE '+DATA/ixp/datafile/undotbs1.258.874104679'
AUTOEXTEND ON NEXT 5M MAXSIZE 65535M;
```

3. Create more datafiles in UNDO tablespace by issuing following command:

```
sql> ALTER TABLESPACE "UNDOTBS1" ADD DATAFILE '+DATA' SIZE 50G REUSE
AUTOEXTEND ON NEXT 5M MAXSIZE 65535M;
```

Note: The creation of datafile of size 50GB takes around 5-6 mins. The above procedure may take upto 30 min to complete.

4.4.2 Procedure to create IXP user and tablespaces

1. Copy MEDIATION iso to "/cloudfs" directory on oracle box and log on as root user.
2. Mount the MEDIATION iso to /mnt/upgrade. If directory does not exists then create it by below command:

```
# mkdir -p /mnt/upgrade
# mount -o loop <ISO PATH> /mnt/upgrade
```

3. Create log directory for mediation server database jobs

```
# mkdir -p /var/TKLC/log/ixp
# chown oracle:oinstall /var/TKLC/log/ixp
```

4. Change user to oracle and export ORACLE_SID variable
   Note: Replace IXP in the export command by the accurate name choosen during the creation of each instance (IXP0 or IXP1)
5.

```
# su - oracle
# export ORACLE_SID=IXP
# ORAENV_ASK=NO source oraenv
```

6. Execute script createUserTbsp.sh

```
# cd /mnt/upgrade/migration/oracle/instance/cmd/
# ./createUserTbsp.sh
```

   Provide the parameters asked by the script.

   Note: In logs there will be many spool log error which should be ignored. Verify the logs for errors other than spool log error

7. Switch to root user and umount the ISO after successful execution of above step 5 using command

```
# exit
# umount /mnt/upgrade
```

4.4.3 Procedure to Disable Archive Log

Note: Replace IXP in the export command by the accurate name choosen during the creation of each instance (IXP0 or IXP1)

1. Login as sysdba user

```
# su - oracle
# export ORACLE_SID=IXP
# ORAENV_ASK=NO source oraenv
# sqlplus / as sysdba
```

2. Shutdown database

```
sql> shutdown immediate;
```

3. Start database

```
sql> startup mount;
```

4. Disable archive log

```
sql> alter database noarchivelog;
```

5. Open database

```
sql> alter database open;
```

```
sql> quit;
```

4.5 Configure the PDU storage

The PDU storage can be configured on the ODA using NFSv4.

Note: Be sure that the "/cloudfs" partition has already been properly sized during the creation of the first database on the ODA (see section **4.3**).

Note: Run this procedure on ODA_BASE server.

1. Create PDU storage directories as root user:
```
# cd /cloudfs
# mkdir -p pdu_1
# chmod 777 /cloudfs/pdu_1
```

2. Update the /etc/exports file as root user.
   Add the following lines into the /etc/exports file:
```
/cloudfs/pdu_1  ixp????-??(rw,async,no_root_squash,anonuid=-1)
```

3. Update the /etc/hosts.
   Add all the mediation servers that will use this server as external PDU storage target into the /etc/hosts file. Only those machines that will be present in /etc/hosts file and will pass the ixp hostname mask will be able to use this server as an external PDU storage server.
   As root, edit the /etc/hosts file using vi editot and add the following line for all the mediation servers. Save the file after modification.
```
<ip_address>    <mediation_server_hostname>
```
   For example:
```
10.31.2.61      ixp9010-1a
10.31.2.62      ixp9010-1b
```

4. Restart the NFS service
   As root run:
```
# service nfs stop
# service portmap restart
# service nfs start
```

5 SYSTEM CONFIGURATION ON ZFS

5.1 ZFS server Installation

Install the ZFS server using the documents described in (http://docs.oracle.com/cd/E56021_01/html/E55847/index.html)

5.2 Configure ZFS

This refers to the procedure for the network and storage configuration on ZFS after the ZFS server has been installed. The procedure shall also be needed to create the NFS shares. The procedures are available in (http://docs.oracle.com/cd/E56021_01/html/E55851/index.html)

The typical configuration required for creating the shares on ZFS server is mentioned below:

a) Initial Appliance Configuration
b) Network Configuration
c) Storage Configuration
d) Working with Shares
    a. Share Properties
    During the creation of shared directories only the name and permissions should be provided. Permissions should be given to all, the name of the shared directory must contain the **"pdu_"**

Note: ZFS allows both nodes of the system to work in clustered mode (this mode has not been used during lab testing). Please, refer to the ZFS documentation to learn what are the advantages of using this mode and how to set it up: http://docs.oracle.com/cd/E56021_01/html/E55851/gokgf.html#scrolltoc.

Note: All the configuration should be done using BUI

Recommendation

a) In general, multiple pools with same profile are discouraged for the following reasons:
    i. Wastes system resources that could be shared in a single pool.
    ii. Decreases overall performance.
    iii. Increases administrative complexity.
    iv. Log and cache devices can be enabled on a per-share basis.

    Storage should be added to the existing pool with the same profile, unless the intent is to assign ownership of this resource to the cluster peer.

b) As it is a good compromise between performance and high availability, even if usable disk space is reduced by a third of the overall disk space allocated, the "Double parity" data profile should be chosen; if usable disk space is not a priority, choose "Mirrored" as data profile (with the NSPF* option activated), in which case less than half of the allocated disk space can be used for PDU storage.

c) The "Mirror log" should be chosen for the log profile (if possible select the profile where NSPF* is available).

d) *NSPF indicates no single point of failure, which affords certain profiles the ability for a pool to survive through loss of a single disk shelf.

In case the PDU storage is done on non ZFS storage, refer PIC Standard Server PDU Storage Installation Procedure doc ID 2062544.1for installation of PDU storage on external storage server.

6 ACQUISITION SERVER APPLICATION INSTALLATION PROCEDURES

This section provides the procedures for installing the acquisition server application.

Note: This step should be executed for all the servers in sub-system.

6.1 Pre-Install Configuration

This section provides procedures to configure the acquisition servers that must be performed before installing the acquisition server application.

6.1.1 Temporary customer IP assignment

This procedure provides instructions to temporary customer IP assigment to transfer the Application ISO on server during installation.

Note: This procedure is only to be used to transfer the Application ISO during installation.

Configure Vlan tagging and assign ip address in case of Integrated Acquisition Server

a) Login via ILO, iLOM, to server as root

b) Execute following commands (1st line for E5-APP-B only):

```
# ifconfig eth01 up
```

```
# modprobe 8021q
# vconfig add eth01 200
# ifconfig eth01.200 <CUST IP ADDRESS> netmask <MASK>
# route add default gw <DEFAULT ROUTE IP ADDRESS>
```

Assign ip address in case of Probed Acquisition Server: see APPENDIX: Manual configuration of ethernet interfaces

6.1.2 Copy ISO

a) Transfer acquisition server ISO on the server to /var/TKLC/upgrade directory

b) Verify that ISO file is transferred completely on the server.

6.1.3 Configure server

This procedure describes how to configure the acquisition servers prior to installing the application.

Note: This procedure must be executed on all of the Integrated and Probed acquisition servers.

Change the current hostname, designation and function

Note: The designation and function are case sensitive and must be capitalized; otherwise, the software functionality will not work properly and will result in the need to reinstall the application.

a) Enter the platcfg menu, as root run:

```
# su – platcfg
```

b) Select Server Configuration->Hostname
c) Select Edit
d) Set the hostname
e) Select Server Configuration -> Designation/Function.
f) Select Edit.
g) Change the designation and function.

- For a Integarted Acquisition subsystem:

  In the Designation field, enter the designation in the following format: 1A for the first server, 1B for the second, and so on. In the Function field, enter IMF.

- For a standalone Probed Acquisition:

  In the Designation field, enter the 0A for the server. In the Function field, enter PMF.

h) Select Exit.

6.1.4 Install the bulkconfig file

1. Login as root user.
2. For creation of /root/bulkconfig file refer section 13.4Acquisition Server Bulkconfig File Description.

6.2 Acquisition Server Pre-Install Healthcheck

This procedure describes how to run the syscheck and analyze the output to determine the state of the server before installing the acquisition server application.

Log in as root on the server that you want to install the acquisition server application.

Run:

```
# syscheck
```

Review the fail_log file (/var/TKLC/log/syscheck/fail_log) for any errors.

```
Example ouput for a healthy system:
Running modules in class disk...
                        OK

Running modules in class hardware...
                        OK

Running modules in class net...
                        OK

Running modules in class proc...
                        OK

Running modules in class system...
                        OK

Running modules in class upgrade...
                        OK

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

6.3 Install Acquisition Server Application

This procedure describes how to install the acquisition server application on a server that has the operating system installed.

Note: Run this procedure from iLO console

1. Log in as root user
2. Enter the platcfg menu, as root run:

```
# su – platcfg
```

3. Select Maintenance ➢ Upgrade ➢ Initiate Upgrade.
4. Select the acquisition server application media and press Enter.

Informational messages appear on the terminal screen as the upgrade proceeds. When installation is complete, the server reboots and displays the login prompt.

You can check the TPD upgrade log file (/var/TKLC/log/upgrade/upgrade.log) for any error; but the status of the server will be checked when you run the healthcheck script after you configure the switches.

6.3.1 Install JRE

Execute APPENDIX: Install JRE 1.8.

6.4 Configure Site and Subsystem for Acquisition Server

This procedure describes how to create a site on Management Server and set a subsystem in this new site.

The subsystem is treated as a cluster, accessible by Management Server through this IP address.

A dedicated IP address, called Virtual IP (VIP), is needed for the subsystem. This address must be a real address in the subsystem subnet that is not physically used by any other server or equipment. The current Active Master server in the subsystem is the server representing the VIP.

For a standalone Probed Acquisition Server, the VIP is the IP address of the server. For a single-server Integrated Acquisition Server, it is possible to assign the server IP address as VIP; however, when additional servers are added, the VIP address must be changed to a dedicated IP address to work properly. It is recommended that a dedicated IP address be used from the beginning, to avoid changing the VIP when more servers are added.

In this release due to various security enhancements, the generation of oracle wallet and its sync to each of the server in the sub-system is mandatory. The wallet generation and syncing shall be required on every new site/sub-system creation. The procedures have been defined in the PIC 10.2 Maintenance Guide doc ID E60679.

Note: There is only one Acquisition subsystem supported per site. If a standalone Probed Acquisition is in a site/subsystem, no other Acquisition subsystem or standalone Probed Acquisition can be added. They need to be added to different logical site in **Centralized Configuration.** All of the configuration is performed through the Management server application interface.

1. **Sync Database Credentials**

   Execute procedure described in section **7.17 Sync Database Credentials** in PIC 10.2 Maintenance Guide doc ID E60679

   Note: The sync of credentials must be done for all the servers in the acquisition sub-system.

2. **Log in to the Management server application**

   a) Log in as tekelec to the Management server application interface using the management server IP address.

   b) Click **Centralized configuration.**

3. **Create a site on CCM**

   a) Select **Equipment Registry ► Sites ► Add.**

b) Type the desired site name and click **Add.**

Note: Refer to Chapter 5 section Site Creation and Discovery Process of PIC Centralized Configuration Manager Administrator Guide doc ID E66853 for configuring Production and Management Network.

4. **Create Acquisition sub-system and Add the server(s) on Management Server**

   Note: Skip this step if the Site already exists.

   a) Select **Equipment Registry ► Sites ► *New site name created* ► XMF ► Add** or select ***Equipment Registry ► Sites ► New site name created ► OCDSR ► Add*** for OCDSR
   b) Type the server IP address(es) for the xMF subsystem and click **Add** or for OCDSR type the server IP and the DSR SOAM VIP.
   c) Click **Create.**

   Note: Refer to Chapter 5 section Site Creation and Discovery Process of PIC Centralized Configuration Manager Administrator Guide doc ID E66853 for configuring Production and Management Network. For adding OCDSR site refer section "Adding An Integrated ODCDSR".

6.5 Acquisition Server Healthcheck post customer integration

This procedure describes how to run the healthcheck script on acquisition servers.

The script gathers the healthcheck informationon each server in the acquisition subsystem or from standalone server. The script should be **run from each of the server** of the acquisition subsystem or on stand-alone. The output consists of a list of checks and results, and, if applicable, suggested solutions.

1. Open a terminal window and log in as cfguser on each server in the acquisition subsystem or standalone server.
2. Run the automatic healthcheck script.

```
$ analyze_server.sh -i
```

3. Analyze the output of the script for errors. Issues reported by this script must be resolved before any further usage of this server. Verify no errors are present.

   If the error occurs, contact Oracle Support using APPENDIX: My Oracle Support (MOS)

   Example output for a healthy server in a subsystem:

```
04:57:30: STARTING HEALTHCHECK PROCEDURE - SYSCHECK=0
04:57:31: date: 02-26-16, hostname: imf9040-1a
04:57:31: TPD VERSION: 7.0.3.0.0-86.40.0
04:57:31: XMF VERSION: [ 10.2.0.0.0-24.1.0 ]
04:57:32: ------------------------------------------------
04:57:32: Checking disk free space
04:57:32:       No disk space issues found
04:57:32: Checking syscheck - this can take a while
04:57:43:       No errors in syscheck modules
04:57:44: Checking statefiles
04:57:44:       Statefiles do not exist
04:57:44: Checking runlevel
```

```
04:57:45:      Runlevel is OK (4)
04:57:45: Checking upgrade log
04:57:45:      Install logs are free of errors
04:57:45: Analyzing date
04:57:46:      NTP deamon is running
04:57:46:      IP of NTP server is set
04:57:46:      Server is synchronized with ntp server
04:57:47: Analyzing IDB state
04:57:47:      IDB in START state
04:57:47: Checking IDB database
04:57:48:      iaudit has not found any errors
04:57:48: Analyzing processes
04:57:49:      Processes analysis done
04:57:49: Analysing database synchronization
04:57:50:      Either Database synchronization in healthy state or errors found are non-blocking
04:57:50: Checking weblogic server entry
04:57:50:      Appserver is present
04:57:50: All tests passed. Good job!
04:57:51: ENDING HEALTHCHECK PROCEDURE WITH CODE 0
```

4. **Modifying IP header format version on Probed Acquisition Server**:
   This procedure describes how to modify the IP Header format version for IP Raw PDUs on Probe. By default, the version support is 0 in LongParam table. This is done to support the use case when xDR builders are still using the old IP header format, However on fresh installed site this parameter must be changed to indicate new version on Probe Server. The current version supported for 10.2 is “2”.

   This support is activated by the parameter **‘IPHeaderFormat’** inside the ‘**LongParam**’ table:

```
Yes|IPHeaderFormat|2|Ip Header version (2 -V2, 1 -V1, 0 -V0: Default-0)
```

   The parameter can be modified using the following command:

```
iset -fvalue=2 LongParam where "name='IPHeaderFormat'"
 === changed 1 records ===
```

   After modification of this parameter, the **pduServer0 process** must be restarted using

```
pm.set off pduServer0
pm.set on pduServer0
```

   Note: In case of major upgrade, the parameter must be set to New Format “2” after the Mediation server and xDR Builders have been upgraded.

   Note: A clobber on the Probe Acquisition server will reset to the default value.

7 DATA RECORD STORAGE INSTALLATION PROCEDURES

7.1 Configure Data Record Storage on ODA

Note : This section must be executed for ODA based DRS server only.

To create schema, install DTO package and to schedule jobs there is a consolidated script "installExtDWS.sh".

Execute following commands

Note:

Replace IXP in the export command by the accurate name choosen during the creation of each instance (IXP0 or IXP1)

In the installExtDWS, the first "IXP" is the user name and must be "IXP", the second "IXP" parameter is the instance name (IXP0 or IXP1)

```
# su - oracle
# export ORACLE_SID=IXP
# ORAENV_ASK=NO source oraenv
# cd /mnt/upgrade/migration/oracle/instance/cmd/
# ./installExtDWS.sh IXP IP_of_DWS_Server IXP
```

The script shall prompt for the "ixp" user and "sys" user password.

Note: In logs there will be many spool log error which should be ignored. Verify the logs for errors other than spool log error.

The DR storage database creation is complete and it can be discovered on management server.

7.2 Configure Oracle on ODA based Data Record Storage

This step can be performed after the discovery of DR Storage on management server.

Note: Mount the ISO using root user if the ISO is not already mounted.

To create data and index file(s) on ODA based DR Storage there is a separate script, which can be executed from ODA database server or from remote mediation base server.

It is suggested to create the data and index files in the ratio of 30 and 20 (data: index is 30:20), of the space allocated from the total available space for each instance.

Note:

Replace IXP in the export command by the accurate name choosen during the creation of each instance (IXP0 or IXP1)

In the other commands, the first "IXP" is the user name and must be "IXP", the second "IXP" parameter is the instance name (IXP0 or IXP1)

1. Obtain total available space.

   ODA database server: The total space and available space can be found by following commands :

```
# su - oracle
# export ORACLE_SID=IXP
# ORAENV_ASK=NO source oraenv
```

```
# cd /mnt/upgrade/migration/oracle/utils/cmd/
# ./CreateDataAndIndexFile.sh IXP IP_of_DWS_Server IXP
```

Or

Remote Mediation Server: The total space and available space can be found by following commands:

```
# su - cfguser
# cd_oracle_utils
# ./CreateDataAndIndexFile.sh  IXP IP_of_DWS_Server IXP
```

2. Obtain number of data and index files that can be created within provided percentage usage from command line.

   ODA database server: The number of data and index files that can be created within provided percentage of space can be found by following commands :

```
# ./CreateDataAndIndexFile.sh IXP IP_of_DWS_Server IXP  -p
<PERCENT_USE>
```

   Or

   Remote Mediation Server: The number of data and index files that can be created within provided percentage of space can be found by following commands:

```
# ./CreateDataAndIndexFile.sh IXP IP_of_DWS_Server IXP  -p
<PERCENT_USE>
```

3. Create data and index files.

   In the following command if the percentage switch <PERCENT_USE> is not provided then it creates the data and index files in ratio of 30 and 20 (data: index is 30:20), reserving 10% of total space from available space, else it will use <PERCENT_USE> percent of available space to create data and index file.

   ODA database server:

```
# ./CreateDataAndIndexFile.sh  IXP IP_of_DWS_Server IXP  -p
<PERCENT_USE> -r
```

   Or

   Remote Mediation Server:

```
# ./CreateDataAndIndexFile.sh  IXP IP_of_DWS_Server IXP  -p
<PERCENT_USE> -r
```

   Where, <PERCENT_USE> is an integer value greater than 0 and less than 100. It is the percentage of available usable space user want to allocate for data and index file creation.

   This procedure can take a very long time (up to 5 hours).

4. Unmount the mediation server ISO from ODA database server as root user:

```
# umount /mnt/upgrade
```

7.3 Add Data Record Storage to CCM

This procedure describes how to add the DRS to the CCM on Management Server. This procedure is performed through the Management application interface.

1. Log in to the Management server GUI and open Centralized Configuration (CCM)
   a) Log in to the NSP application interface as tekelec using the Mangement server IP address.
   b) Open the Centralized Configuration application.
   c) Select Equipment Registry.
2. Configure the new site
   a) Right-click the Sites list and select Add to enter new site configuration.
   b) Type the Site name and Description and click Add.
3. Add the DRS to the site
   a) Navigate to Sites.
   b) Right-click DWH and select Add to enter the DRS configuration:
      - Fill the DRS server hostname into the Storage Name field.
      - Fill the Service Name (IXP by default)
      - Fill in the IP address of the DRS.

Note: If the DRS added is the same storage pool then it must have the same capacity in terms of storage. The number of DATA_CDR and DATA_IND files should be same and of same size.

   c) Click Add.

4. Modify Password and Sync Database Credentials

   Execute procedure described in section **7.16 Modify Database Password** in PIC 10.2 Maintenance Guide doc ID E60679, however user can keep the new password same as old one. The step is just needed to create DWS credentials in the wallet and sync to the mediation servers present in the sub-system.

8 MEDIATION APPLICATION INSTALLATION PROCEDURES

This section provides the procedures for installing the Integrated xDR Platform (MEDIATION) application.

Warning: The procedures must only be executed on Mediation Base servers and must not be executed on Mediation PDU servers.

8.1 Mediation Server Pre-Install Configuration

This procedure describes how to configure mediation server prior to installing the application.

Before you perform this procedure, make sure you have read and are familiar with the Mediaion Server Bulkconfig File Description.

Note: When creating a bulkconfig file on a server in the Mediation subsystem, if such a file has already been created on a different server, then reuse that bulkconfig file. The content of the bulkconfig file is the same for all servers in the Mediation subsystem.

8.1.1 Verify each server healthcheck.

1. Run syscheck. Log in as root on the server that you want to install the application. As root run:

```
# syscheck
```

Review the /var/TKLC/log/syscheck/fail_log file for any errors.

Example output of healthy server:

```
Example ouput for a healthy system:
Running modules in class disk...
                    OK

Running modules in class hardware...
                    OK

Running modules in class net...
                    OK

Running modules in class proc...
                    OK

Running modules in class system...
                    OK

Running modules in class upgrade...
                    OK

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

Resolve each error before you continue with the procedure.

Note: Errors of NTP in syscheck can be ignored at this time, as NTP server is not configured

8.1.2 Configure Bonding Interface (Optional)

Note: In case of bonding, if any of the interface is down e.g. eth01 or eth02, then no alarm will be raised by the platform or the application.

1) Login into the mediation server's console
2) To create the bonding interface, as root, run:
```
netAdm add --device=bond0 --bootproto=none --type=Bonding --addr=<ip-address> --netmask=<network-mask> --onboot=yes --mode=active-backup --miimon=100 --bondInterfaces=eth01,eth02
```
3) To create the default route, as root, run:
```
netAdm add --route=default --device=bond0 --gateway=<gateway-ip>
```

8.1.3 Create the bulkconfig file

1. As a root user.
2. Create the /root/bulkconfig file as explained in Appendix Mediation Server Bulkconfig File Description.

   Note: Be sure to have one `host` entry per MEDIATION server in the bulkconfig file. Enter the hostname as `ixp`**`NNNN`**`-`**`MA`**, with:

   a. the same **`NNNN`** designation (4 digits) for all the servers of the MEDIATION subsystem and the same as for the related DRS (not necessary for DRS on Standard Server)
   b. the same **`M`** designation (1 digit, excluding "0") for all the servers for the MEDIATION subsystem and the same as for the related DRS (not necessary for DRS on Standard Server)
   c. as its **`A`** designation (a small letter), "a" for the first server in this MEDIATION subsystem, "b" for the second server, and so on…

   Note: If a bonding interface has been configured (see section 8.1.2 Configure Bonding Interface), be sure to use the **bond0** interface (and not the usual **ethxx** interface) in the **bulkconfig** file.

8.1.4 Configure the server hostname

1. Enter the **platcfg** menu.

   As root, run:
```
# su - platcfg
```
2. Select **Server Configuration -> Hostname**
3. Click **Edit**.
4. Enter the server hostname in the standard format: ixp***NNNN-MA*** ("Take attention that this name is the same as it put in the bulkconfig file").
5. Exit the platcfg menu.

8.2 Install Mediation Server

This procedure describes how to install the Mediation Server application on the TPD platform.

Before you perform this procedure, make sure that you have the appropriate mediation server ISO file available.

Verify the /root/bulkconfig file needed for this installation has been created on the server accordingly to specific application directions as a result of pre-install configuration step.

Note: Run this procedure via iLO.

8.2.1 Temporary customer IP assignment

This procedure provides instructions to temporary customer IP assignment to transfer the Application ISO on server during installation.

Note: This procedure is only to be used to transfer the Application ISO during installation.

Refer to APPENDIX: Manual configuration of ethernet interfaces

Note: The temporary customer IP assignment is not to be executed if a bonding interface has been setup

8.2.2 Copy ISO

1. Copy mediation server iso to /var/TKLC/upgrade folder.

8.2.3 Install the application

1. From platcfg menu select Maintenance -> Upgrade -> Initiate Upgrade.

   When the installation process is complete, the server restarts automatically.

   Note: after the server has restarted, at login, a message asking to accept or reject the upgrade is displayed: the message can be safely ignored until the Integrate Customer Network step has been executed.

2. If the ISO file was copied to the server, then remove this file to save disk space.

   As root, run:

   ```
   # rm -f /var/TKLC/upgrade/iso_file
   ```

   where iso_file is the absolute path of the ISO image, which includes the name of the image.

8.2.4 Analyze the installation log

Review the installation log (/var/TKLC/log/upgrade/upgrade.log) for any errors.

If there are any errors, contact the Oracle Support Team at APPENDIX: My Oracle Support (MOS)

8.2.5 Install JRE

Execute APPENDIX: Install JRE 1.8.

8.3 Mediation Server Post-Install Healthcheck

This procedure describes how to run the server health check after the application has been installed on the server.

1. Log in on the server that you want to analyze.
2. As cfguser, run:

   ```
   $ analyze_server.sh -p
   ```

The script gathers the health check information from the server. A list of checks and associated results is generated. There might be steps that contain a suggested solution. Analyze the output of the script for any errors. Issues reported by this script must be resolved before any further use of this server.

The following examples show the structure of the output, with various checks, values, suggestions, and errors.

Example of overall output:

```
08:43:58: STARTING HEALTHCHECK PROCEDURE - SYSCHECK=0
08:43:59: date: 05-17-15, hostname: ixp0907-1a
08:43:59: TPD VERSION: 7.0.1.0.0-86.20.0
08:44:00: IXP VERSION: [ 10.1.5.0.0-3.2.0 ]
08:44:00: XDR BUILDERS VERSION: package TKLCxdrbuilders is not installed
08:44:00: ---------------------------------------------------
08:44:01: Analyzing server record in /etc/hosts
08:44:01:       Server ixp0907-1a properly reflected in /etc/hosts file
08:44:02: Analyzing IDB state
08:44:02:       IDB in START state
08:44:03: Analyzing shared memory settings
08:44:03:       Shared memory set properly
08:44:04: Analyzing IXP Licence
08:44:05:       Ixp Licence Valid
08:44:05: Analyzing mount permissions
08:44:05:       Writing enabled for pdu_1
08:44:06:       Writing enabled for pdu_2
08:44:06:       All mount permissions set properly
08:44:06: Analyzing date
08:44:07:       NTP deamon is running
08:44:07:       IP of NTP server is set
08:44:08: Checking CPU usage
08:44:08:       CPU usage check done
08:44:08: Running iaudit
08:44:10:       iaudit did not find any errors
08:44:10: Analyzing disk usage
08:44:11:       Space not exceeded
08:44:11: Analyzing JMX agent properties
08:44:12:       Instance ID of JMX agent OK
08:44:13:       IxpMbean [ application type IXP+2 ] located
08:44:13: Checking syscheck - this can take a while
08:44:17:       No active alarms
08:44:17: Checking services
08:44:17:       NFS service is running
08:44:18:       Portmap service is running
08:44:18: Analyzing bulkconfig content
08:44:19:       BulkConfig content is consistent
08:44:19: All tests passed!
08:44:19: ENDING HEALTHCHECK PROCEDURE WITH CODE 0
```

Example of a failed test:

```
12:21:48: Analyzing IDB state
12:21:48: >>> Error: IDB is not in started state (current state X)
12:21:48: >>> Suggestion: Verify system stability and use 'prod.start'
to start
the product
```

Note: if the following error shows up during server analysis, it can be simply ignored, as the alarm will be cleared after Integrate Customer Network step (see below) will have been executed.

```
12:21:48: >>> Error: Alarm raised for tpdServerUpgradePendingAccept...
12:21:48: >>> Suggestion: Check /var/TKLC/log/syscheck/fail_log...
```

In any other cases, after attempting the suggested resolution, if the test fails again, then contact APPENDIX: My Oracle Support (MOS)

8.4 Integrate Customer Network

This procedure describes how to integrate the mediation subsystem post-manufacturing customer network.

This procedure uses the /root/bulkconfig file as an input for the customer network integration. Before you perform this procedure, make sure you have read and are familiar with the chapter 13.3 Mediation Server Bulkconfig File Description.

This procedure is run from the iLO.

1. Update the bulkconfig file

   a) Log in on the iLO of **any Mediation server** in the Mediation subsystem that you want to reconfigure.

   b) Update the /root/bulkconfig file with the customer IP addresses and timezone.

   c) Make entries for PDU mounts for external PDU storage in bulkconfig file.

   Note: The step c) shall take care of the case where the PDU storage is done on ZFS server. The customer integration step shall automatically take into account the shared NFS mount points created on ZFS.

2. Run the customer network integration

   a) Run the mediation subsystem customer network integration script. As root, run:
   ```
   # bc_customer_integration.sh
   ```

   b) Confirm this operation.
   Enter yes.
   A prompt for the root password appears.

   c) Provide the root password.
   The servers reboot.

3. Run the post-integration settings

   Note: The mediation server has new IP address. The previous addresses are no longer accessible.

   a) Run post-integration settings. As root, run:
   ```
   # bc_customer_integration.sh --post
   ```
   A prompt for the root and cfguser passwords appears.

   Note: The key exchange operation is part of this script.

   b) Provide the appropriate passwords.
   When the script is complete, check the terminal output for any errors. If the error occurs, contact the APPENDIX: My Oracle Support (MOS)

8.5 Add Mediation Subsystem to CCM

This procedure describes how to add the Mediation subsystem to the CCM on Management server. This procedure is performed through the NSP application interface.

For an estimated time for this procedure, refer to the mediation subsystem overview flowchart.

In this release due to various security enhancements, the generation of oracle wallet and its sync to each of the server in the sub-system is mandatory. The wallet generation and syncing shall be required on every new site/sub-system creation. The procedures have been defined in the PIC 10.2 Maintenance Guide doc ID E60679

Note: a pool of DRS (it can be one single DRS) must already have been declared in CCM. A pool of DRS cannot be the primary xDR storage of several mediation subsystems (the primary xDR storage is the DRS pool that is selected when the mediation subsystem is declared in CCM).

1. **Sync Database Credentials**

   Execute procedure described in section **7.17 Sync Database Credentials** in PIC 10.2 Maintenance Guide doc ID E60679

   If DRS present in the site is already added and integrated with the CCM then above procedure should be sufficient. However if DRS is not integrated into CCM then it is must to execute procedure **7.16 Modify Database Password** in PIC 10.2 Maintenance Guide doc ID E60679 , however user can keep the new password same as old one. The step is just needed to create DWS credentials in the wallet and sync to the mediation servers present in the sub-system.

2. **Log in to the NSP and open Centralized Configuration (CCM)**

   a) Log in to the NSP application interface as tekelec using the Management Server server IP address
   b) Open the Centralized Configuration application.
   c) Select Equipment Registry.

3. **Configure the new site**

   Note: Configure new site only if earlier created site does not exists.

   a) Right-click the Sites list and select Add to enter new site configuration.
   b) Type the Site name and Description and click Add.

4. **Add the mediation subsystem to the site**

   a) Navigate to Sites.
   b) Right-click IXP and select Add to enter the mediation subsystem configuration.
   c) Type values for the following fields:

      - Mediation subsystem name in **Subsystem Name**
      - Dedicated IP address for the mediation subsystem in **VIP Address.**

Note: The Virtual IP (VIP) Address is an actual IP address in the same subsystem subnet that is not physically used by any other server or equipment. The subsystem is treated by Management Server as a cluster accessible from Management Server through this IP address.

- Add IP address of all mediation servers

d) Click Add.

e) Verify that all of the added servers are listed in the Locations list.

f) Select the DRS pool to use as primary xDR storage.

g) Click Create.
Information is synchronized from the mediation servers to the Management Server.

5. Apply the configuration changes

a) Navigate to **Mediation** tab.

b) In the left-hand menu, open **Sites**, open the site on which the Mediation subsystem has been created, open IXP and right-click the Mediation subsystem name.

c) Select **Apply changes…** and click **Next**, **Next**, **Apply changes**

d) Confirm by clicking **OK**

e) Click **Done** when the changes have been applied

Note: "Unable to update or create capacity management session" warning must be ignored during Apply Change.

8.6 Install xDR Builders

This procedure describes how to trigger the xDR Builders installation on the Mediation subsystem from the CCM.

1. Log in on the Management Server Admin server and insert the xDR DVD/CD or copy the ISO file at /var/TKLC/upgrade, if it exists. If not then create it.

   Note: Don't copy the builder ISO at root directory.

   a) Open a terminal window and log in on the Management Server Admin server.

   b) Insert the xDR Builders DVD/CD or copy the xDR Builder ISO file to the Management Server Admin server.

2. Run the install script

   a) As root, run:
   ```
   # cd /opt/nsp/scripts/oracle/cmd
   # ./install_builder.sh
   ```
   The following prompt appears:

   Please enter path to Builder ISO [/media/cdrom]:

   b) Enter the appropriate response based on the media used:

   - For a DVD/CD, press **Enter.**
   - For an ISO file, enter the exact path including the ISO file name.

   c) Wait until the installation is complete.

   Note: the script may ask password for oracle user many times.

3. Verify the ISO installation on Management Server

a) Open a web browser and log in as TklcSrv on the management server application interface.
b) Open the **Upgrade Utility**.
c) Click **Manage Builder Rpm** in the left tree.
A list of xDR Builder RPMs appears. The ISO file installed in the previous step is on this list, with a state **Not Uploaded.**

4. Upload Builders RPM

a) Select the desired xDR Builder RPM with the **Not Uploaded** state and click **Upload**. A confirmation window appears.
b) Click **Continue** to continue the RPM upload.
If the upload is successful, then the RPM state changes to **Uploaded.**
c) In case the RPM upload fails, then the state of will change back to "Not Uploaded" or "Query/Filter Upgrade Failed".

- If the builder RPM upload fails in creating new builder and dictionaries then the state is "Not Uploaded", after failure. At this state, this step can be repeated once the failure issues are resolved.
- If the builder RPM upload fails in upgrading the configurations (Query/xDR filter) then the state is "Query/Filter Upgrade Failed" after failure.

5. Upgrade Queries and Filters

In case the state of the RPM is "Query/Filter Upgrade Failed", then only configurations (Query/xDR filter) are required to be upgraded. Below are steps for the same

a) Mark the requested builder RPM with the "Query/Filter Upgrade Failed" state and press "Upgrade Queries and Filters" button in the toolbar.
b) A dialog box will appear. Click on Continue to continue the upgrade.
c) After the successful upload the RPM state will change to **Uploaded**

6. Associate the xDR Builders RPM with the Mediation subsystem

a) Click **View Builder RPM Status** in the left tree. A list of the Mediation subsystems appears.
b) Select one or more Mediation subsystems and click **Associate RPM Package**. A list of Builder RPMs that are uploaded in Management Server appears.
c) Select the appropriate xDR Builder RPM and click **Associate**.
If the association is successful, then the list of the subsystems is updated. The **RPM Name** column contains the new RPM package name and **Association Status** is marked as **OK.** If the association fails contact the Oracle Support, APPENDIX: My Oracle Support (MOS)

7. Apply the configuration to the Mediation subsystem

a) Logout from TklcSrv and login with any other user with sufficient privilege for Centralized Configuration application
b) Open the **Centralized Configuration** application.
c) Navigate to **Mediation**.
d) Open **Sites** and open the site; then, open **IXP**.
e) Right-click the subsystem and select **Apply changes...**.
f) Click **Next.**
g) Click **Apply Changes.** (***WARNING***: ***Not as TklcSrv user***).
h) When change is complete, verify there are no errors on the result page.

8. Install the xDR Builders RPM on Mediation Server

   a) Return to the main page of the NSP application interface, log in as TklcSrv.
   b) Open the **Upgrade Utility**.
   c) Click **View Builder RPM Status** in the left tree.
      The available MEDIATION subsystem with their respective RPM Associate Status and Install Status appears.
   d) Before initiating the builder installation, make sure the **Builder RPM** that you want to install on the MEDIATION subsystem is associated with the MEDIATION subsystem as indicated by **RPM Name** column and **Association Status** marked as **OK**. Also, **Install Status** should contain either - or **No Started**.
   e) Select one or more Mediation subsystems and click **Install RPM Package**. If the installation is successful, the **Install status** changes to **OK**. If the installation fails contact Oracle Support, APPENDIX: My Oracle Support (MOS)

8.7 Capacity Management KPIs installation

Capacity Management is a statistical session is generated with a dedicated xDR builder.
It provides very detailed self-surveillance data which can be better analyzed after selection and aggregation.
Derived statistical data are produced in real time (periodicity at the minute, quarter of hour and hour).
These statistical results are stored as regular xDR, which allows to manage this with standard PIC tools (such as Troubleshooting or Dashboard Application).
They globally provide system activity information in real time and an historical, traffic volume and verify the accuracy according to licenses.

Standard KPI configurations are provided and need mandatory installation steps. In addition optional customized KPI configurations could be added for more perspectives.

8.7.1 Installation Procedures for Capacity Management standard KPIs

This procedure describes how to deploy all needed elements for OCPIC system monitoring. This procedure is essential for license controls and this deployment is NOT optional.

1. **CapacityManagement statistical session deployment**
   a) All elements such as dedicated streams and DataFlows for this statistical session are automatically created as part of system deployment.
   Naming convention makes that needed elements will contain *CapacityManagement* in the name (generally as suffix).

   b) Each time a new equipment such as Mediation or Acquisition server will be added to the system, it will be taken into account by CCM to create all new needed *CapacityManagement* elements. This mechanism will be done by a check at each configuration changes.

   c) You must check whether these elements have been correctly deployed or not (by using CCM and verifying presence or not of dedicated streams and DFP).
   If not, please contact Support team in order to have the needed elements deployed for further usage of *Capacity Management*.

2. **KPI templates deployment**
   a) A set of KPI templates is provided. 3 configurations must be deployed (no automatic feature for this operation):

   - **PIC_UsageStat_Mn**: applied on *CapacityManagement*; provides consolidation / conversion of input Mbps for probed acquisition (PMF), integrated acquisition (IMF) and mediation (MEDIATION) over 1 mn. To apply on the basic statistical session *CapacityManagement* which is part of the standard deployment. Refer to Capacity management good practices(Doc ID 1683859.2) on My Oracle Support

   - **PIC_UsageStat**: applied on *PIC_UsageStat_Mn* result stat session; Agregation of PIC_UsageStat_Mn results over 15 minutes. Provides average, minimum, maximum throughput. To apply on the *PIC_UsageStats_Mn* statistical session (generated from the KPI configuration template **PIC_UsageStat_Mn**). Refer to Capacity management good practices(Doc ID 1683859.2) on My Oracle Support

   - **PIC_ActivityStat**: applied on *CapacityManagement*; Aggregation of key output data flows over 15 minutes, per destination for acquisition server and per final XB for mediation server in Kbps and efficiency. To apply on the basic statistical session *CapacityManagement* which is part of the standard deployment. Refer to Capacity management good practices(Doc ID 1683859.2) on My Oracle Support

The configurations will have to be saved as text files before being imported into KPI application, on Management Server. Refer to KPI user guide to learn how to import configurations and apply them to sessions.

b) Activate the configurations

c) Check the results: the statistical sessions must be created and should contain results. After one minute for *PIC_UsageStats* and after end of next quarter for the 2 others.

For deeper usages of *Capacity Management* please refer to the dedicated document (e.g. MEDIATION and Acquisition Server troubleshooting guides).

8.8 Mediation Subsystem Healthcheck

This procedure describes how to run the automatic healthcheck of the Mediation subsystem.

1. Open a terminal window and log in on any Mediation server in the Mediation subsystem you want to analyze.
2. As **cfguser**, run:

```
$ analyze_subsystem.sh
```

The script gathers the healthcheck information from all the configured servers in the subsystem. A list of checks and associated results is generated. There might be steps that contain a suggested solution. Analyze the output of the script for any errors. Issues reported by this script must be resolved before any further use of this server.

The following examples show the structure of the output, with various checks, values, suggestions, and errors.

Example of overall output:

```
$ analyze_subsystem.sh
-----------------------------------------------------
ANALYSIS OF SERVER ixp0907-1a STARTED
-----------------------------------------------------

09:39:25: STARTING HEALTHCHECK PROCEDURE - SYSCHECK=0
09:39:25: date: 05-17-15, hostname: ixp0907-1a
09:39:25: TPD VERSION: 7.0.1.0.0-86.20.0
09:39:26: IXP VERSION: [ 10.1.5.0.0-3.2.0 ]
09:39:26: XDR BUILDERS VERSION: package TKLCxdrbuilders is not installed
09:39:27: ------------------------------------------------
09:39:27: Analyzing server record in /etc/hosts
09:39:28:       Server ixp0907-1a properly reflected in /etc/hosts file
09:39:28: Analyzing IDB state
09:39:29:       IDB in START state
09:39:29: Analyzing shared memory settings
09:39:30:       Shared memory set properly
09:39:30: Analyzing IXP Licence
09:39:31:       Ixp Licence Valid
09:39:31: Analyzing mount permissions
09:39:32:       Writing enabled for pdu_1
09:39:32:       Writing enabled for pdu_2
09:39:33:       All mount permissions set properly
09:39:33: Analyzing date
09:39:33:       NTP deamon is running
09:39:34:       IP of NTP server is set
09:39:34: Checking CPU usage
09:39:34:       CPU usage check done
09:39:35: Running iaudit
09:39:36:       iaudit did not find any errors
09:39:37: Analyzing synchronization of server
09:39:38:       Role of server is StbMaster
```

```
09:39:38:       ActMaster server - ixp0907-1b
09:39:39:       StbMaster server - ixp0907-1a
09:39:40:       Server synchronizating properly
09:39:40: Analyzing NSP servers settings
09:39:41:       nsp_primary reflected in /etc/hosts
09:39:41:       Ping to nsp_primary OK
09:39:42:       nsp_secondary reflected in /etc/hosts
09:39:42:       Ping to nsp_secondary OK
09:39:42:       nsp_oracle reflected in /etc/hosts
09:39:43:       Ping to nsp_oracle OK
09:39:43:       Oracle on nsp_oracle accessible
09:39:44: Analyzing disk usage
09:39:44:       Space not exceeded
09:39:45: Analyzing JMX agent properties
09:39:45:       Instance ID of JMX agent OK
09:39:47:       IxpMbean [ application type IXP+2 ] located
09:39:47: Checking syscheck - this can take a while
09:39:49:       No active alarms
09:39:50: Checking services
09:39:50:       NFS service is running
09:39:51:       Portmap service is running
09:39:51: Analyzing ssh keys
09:39:51:       Ping to ixp0907-1a OK
09:39:52:       Ping to ixp0907-1b OK
09:39:52:       Ping to ixp0907-1c OK
09:39:52:       Ping to ixp0907-1d OK
09:39:53:       All keys for cfguser accounts exchanged
09:39:53: Analyzing DaqServer table in IDB
09:39:54:       Server ixp0907-1a reflected in DaqServer table
09:39:55:       Server ixp0907-1b reflected in DaqServer table
09:39:55:       Server ixp0907-1c reflected in DaqServer table
09:39:56:       Server ixp0907-1d reflected in DaqServer table
09:39:58:       VIP is set in DaqSubSystem table
09:39:59:       VIP is set in HaVipDef table
09:39:59:       Ping to 10.250.70.115 OK
09:40:00:       VIP is accessible
09:40:00: Analyzing processes
09:40:29: >>> Error: There are too many Dataflow processings (18). Should be 10
at most
09:40:29: >>> Suggestion: Dataflows should be redistributed to other servers
09:40:30:       Processes analysis done
09:40:30: Analyzing Data Feed status
09:40:31:       Data Feed analysis OK
09:40:31:       pdu_1 found in /etc/exports
09:40:32:       pdu_2 found in /etc/exports
09:40:32: Analyzing bulkconfig content
09:40:33:       BulkConfig content is consistent
09:40:33: All tests passed!
09:40:33: ENDING HEALTHCHECK PROCEDURE WITH CODE 0
END OF ANALYSIS OF SERVER ixp0907-1a

-----------------------------------------------------
ANALYSIS OF SERVER ixp0907-1b STARTED
-----------------------------------------------------

09:40:38: STARTING HEALTHCHECK PROCEDURE - SYSCHECK=0
09:40:39: date: 05-17-15, hostname: ixp0907-1b
09:40:39: TPD VERSION: 7.0.1.0.0-86.20.0
09:40:39: IXP VERSION: [ 10.1.5.0.0-3.2.0 ]
09:40:40: XDR BUILDERS VERSION: [ 10.1.5.0.0-3.2.0 ]
09:40:40: ------------------------------------------------
09:40:41: Analyzing server record in /etc/hosts
09:40:41:       Server ixp0907-1b properly reflected in /etc/hosts file
09:40:41: Analyzing IDB state
09:40:42:       IDB in START state
09:40:43: Analyzing shared memory settings
09:40:43:       Shared memory set properly
09:40:44: Analyzing IXP Licence
09:40:44:       Ixp Licence Valid
```

```
09:40:45: Analyzing mount permissions
09:40:45:       Writing enabled for pdu_1
09:40:45:       Writing enabled for pdu_2
09:40:46:       All mount permissions set properly
09:40:46: Analyzing date
09:40:47:       NTP deamon is running
09:40:47:       IP of NTP server is set
09:40:47: Checking CPU usage
09:40:48: >>> Warning: Process IxpBuild -id 43347 [ pid: 6637 ] is taking 96.3%
of CPU
09:40:48:       CPU usage check done
09:40:49: Running iaudit
09:40:50:       iaudit did not find any errors
09:40:51: Analyzing synchronization of server
09:40:52:       Role of server is ActMaster
09:40:52:       ActMaster server - ixp0907-1b
09:40:53:       StbMaster server - ixp0907-1a
09:40:55:       Server synchronizating properly
09:40:56: Analyzing NSP servers settings
09:40:56:       nsp_primary reflected in /etc/hosts
09:40:56:       Ping to nsp_primary OK
09:40:57:       nsp_secondary reflected in /etc/hosts
09:40:57:       Ping to nsp_secondary OK
09:40:57:       nsp_oracle reflected in /etc/hosts
09:40:58:       Ping to nsp_oracle OK
09:40:58:       Oracle on nsp_oracle accessible
09:40:59: Analyzing disk usage
09:40:59:       Space not exceeded
09:41:00: Analyzing JMX agent properties
09:41:00:       Instance ID of JMX agent OK
09:41:01:       IxpMbean [ application type IXP+2 ] located
09:41:02: Checking syscheck - this can take a while
09:41:04:       No active alarms
09:41:05: Checking services
09:41:05:       NFS service is running
09:41:05:       Portmap service is running
09:41:06: Analyzing ssh keys
09:41:06:       Ping to ixp0907-1a OK
09:41:07:       Ping to ixp0907-1b OK
09:41:07:       Ping to ixp0907-1d OK
09:41:07:       Ping to ixp0907-1c OK
09:41:08:       All keys for cfguser accounts exchanged
09:41:08: Analyzing DaqServer table in IDB
09:41:09:       Server ixp0907-1a reflected in DaqServer table
09:41:09:       Server ixp0907-1b reflected in DaqServer table
09:41:10:       Server ixp0907-1d reflected in DaqServer table
09:41:11:       Server ixp0907-1c reflected in DaqServer table
09:41:13:       VIP is set in DaqSubSystem table
09:41:14:       VIP is set in HaVipDef table
09:41:14:       Ping to 10.250.70.115 OK
09:41:14:       VIP is accessible
09:41:15: Analyzing processes
09:41:28: >>> Warning: Process IxpOperate55919 restarted more then 5 times (29)
09:41:35: >>> Error: There are too many Dataflow processings (13). Should be 10
at most
09:41:35: >>> Suggestion: Dataflows should be redistributed to other servers
09:41:35:       Processes analysis done
09:41:36: Analyzing Data Feed status
09:41:37:       Data Feed analysis OK
09:41:37:       pdu_1 found in /etc/exports
09:41:38:       pdu_2 found in /etc/exports
09:41:38: Analyzing bulkconfig content
09:41:38:       BulkConfig content is consistent
09:41:39: All tests passed!
09:41:39: ENDING HEALTHCHECK PROCEDURE WITH CODE 0
END OF ANALYSIS OF SERVER ixp0907-1b

-------------------------------------------------------
ANALYSIS OF SERVER ixp0907-1c STARTED
```

```
-----------------------------------------------------

09:41:44: STARTING HEALTHCHECK PROCEDURE - SYSCHECK=0
09:41:44: date: 05-17-15, hostname: ixp0907-1c
09:41:45: TPD VERSION: 7.0.1.0.0-86.20.0
09:41:45: IXP VERSION: [ 10.1.5.0.0-3.2.0 ]
09:41:46: XDR BUILDERS VERSION: [ 10.1.5.0.0-3.2.0 ]
09:41:46: ------------------------------------------------
09:41:47: Analyzing server record in /etc/hosts
09:41:47:       Server ixp0907-1c properly reflected in /etc/hosts file
09:41:47: Analyzing IDB state
09:41:48:       IDB in START state
09:41:49: Analyzing shared memory settings
09:41:49:       Shared memory set properly
09:41:50: Analyzing IXP Licence
09:41:50:       Ixp Licence Valid
09:41:51: Analyzing date
09:41:51:       NTP deamon is running
09:41:52:       IP of NTP server is set
09:41:52: Checking CPU usage
09:41:52:       CPU usage check done
09:41:53: Running iaudit
09:41:54:       iaudit did not find any errors
09:41:55: Analyzing synchronization of server
09:41:56:       Role of server is Slave
09:41:57:       ActMaster server - ixp0907-1b
09:41:58:       StbMaster server - ixp0907-1a
09:41:59:       Server synchronizating properly
09:41:59: Analyzing NSP servers settings
09:41:59:       nsp_primary reflected in /etc/hosts
09:42:00:       Ping to nsp_primary OK
09:42:00:       nsp_secondary reflected in /etc/hosts
09:42:01:       Ping to nsp_secondary OK
09:42:01:       nsp_oracle reflected in /etc/hosts
09:42:01:       Ping to nsp_oracle OK
09:42:02:       Oracle on nsp_oracle accessible
09:42:02: Analyzing disk usage
09:42:03:       Space not exceeded
09:42:03: Analyzing JMX agent properties
09:42:03:       Instance ID of JMX agent OK
09:42:05:       IxpMbean [ application type IXP+2 ] located
09:42:05: Checking syscheck - this can take a while
09:42:08:       No active alarms
09:42:08: Analyzing ssh keys
09:42:09:       Ping to ixp0907-1a OK
09:42:09:       Ping to ixp0907-1b OK
09:42:09:       Ping to ixp0907-1c OK
09:42:10:       Ping to ixp0907-1d OK
09:42:10:       All keys for cfguser accounts exchanged
09:42:11: Analyzing DaqServer table in IDB
09:42:11:       Server ixp0907-1a reflected in DaqServer table
09:42:12:       Server ixp0907-1b reflected in DaqServer table
09:42:13:       Server ixp0907-1c reflected in DaqServer table
09:42:14:       Server ixp0907-1d reflected in DaqServer table
09:42:16:       VIP is set in DaqSubSystem table
09:42:16:       VIP is set in HaVipDef table
09:42:17:       Ping to 10.250.70.115 OK
09:42:17:       VIP is accessible
09:42:17: Analyzing processes
09:42:36: >>> Error: There are too many Dataflow processings (13). Should be 10
at most
09:42:37: >>> Suggestion: Dataflows should be redistributed to other servers
09:42:37:       Processes analysis done
09:42:37: Analyzing Data Feed status
09:42:39:       Data Feed analysis OK
09:42:39: Analyzing bulkconfig content
09:42:39:       BulkConfig content is consistent
09:42:40: All tests passed!
09:42:40: ENDING HEALTHCHECK PROCEDURE WITH CODE 0
```

```
END OF ANALYSIS OF SERVER ixp0907-1c

-----------------------------------------------------
ANALYSIS OF SERVER ixp0907-1d STARTED
-----------------------------------------------------

09:42:44: STARTING HEALTHCHECK PROCEDURE - SYSCHECK=0
09:42:45: date: 05-17-15, hostname: ixp0907-1d
09:42:45: TPD VERSION: 7.0.1.0.0-86.20.0
09:42:46: IXP VERSION: [ 10.1.5.0.0-3.2.0 ]
09:42:46: XDR BUILDERS VERSION: [ 10.1.5.0.0-3.2.0 ]
09:42:47: ------------------------------------------------
09:42:47: Analyzing server record in /etc/hosts
09:42:47:       Server ixp0907-1d properly reflected in /etc/hosts file
09:42:48: Analyzing IDB state
09:42:48:       IDB in START state
09:42:49: Analyzing shared memory settings
09:42:49:       Shared memory set properly
09:42:50: Analyzing IXP Licence
09:42:50:       Ixp Licence Valid
09:42:51: Analyzing date
09:42:51:       NTP deamon is running
09:42:52:       IP of NTP server is set
09:42:52: Checking CPU usage
09:42:52:       CPU usage check done
09:42:53: Running iaudit
09:42:54:       iaudit did not find any errors
09:42:55: Analyzing synchronization of server
09:42:56:       Role of server is Slave
09:42:56:       ActMaster server - ixp0907-1b
09:42:57:       StbMaster server - ixp0907-1a
09:42:58:       Server synchronizating properly
09:42:59: Analyzing NSP servers settings
09:42:59:       nsp_primary reflected in /etc/hosts
09:42:59:       Ping to nsp_primary OK
09:43:00:       nsp_secondary reflected in /etc/hosts
09:43:00:       Ping to nsp_secondary OK
09:43:00:       nsp_oracle reflected in /etc/hosts
09:43:01:       Ping to nsp_oracle OK
09:43:01:       Oracle on nsp_oracle accessible
09:43:02: Analyzing disk usage
09:43:02:       Space not exceeded
09:43:02: Analyzing JMX agent properties
09:43:03:       Instance ID of JMX agent OK
09:43:04:       IxpMbean [ application type IXP+2 ] located
09:43:05: Checking syscheck - this can take a while
09:43:07:       No active alarms
09:43:07: Analyzing ssh keys
09:43:08:       Ping to ixp0907-1a OK
09:43:08:       Ping to ixp0907-1b OK
09:43:08:       Ping to ixp0907-1d OK
09:43:09:       Ping to ixp0907-1c OK
09:43:09:       All keys for cfguser accounts exchanged
09:43:09: Analyzing DaqServer table in IDB
09:43:10:       Server ixp0907-1a reflected in DaqServer table
09:43:11:       Server ixp0907-1b reflected in DaqServer table
09:43:12:       Server ixp0907-1d reflected in DaqServer table
09:43:12:       Server ixp0907-1c reflected in DaqServer table
09:43:15:       VIP is set in DaqSubSystem table
09:43:15:       VIP is set in HaVipDef table
09:43:15:       Ping to 10.250.70.115 OK
09:43:16:       VIP is accessible
09:43:16: Analyzing processes
09:43:21:       Processes analysis done
09:43:22: Analyzing Data Feed status
09:43:23:       Data Feed analysis OK
09:43:23: Analyzing bulkconfig content
09:43:24:       BulkConfig content is consistent
09:43:24: All tests passed!
```

```
09:43:25: ENDING HEALTHCHECK PROCEDURE WITH CODE 0
END OF ANALYSIS OF SERVER ixp0907-1d

ixp0907-1a      TPD: [ 7.0.1.0.0-86.20.0 ]      IXP: [ 10.1.5.0.0-3.2.0 ]
XB: None       0 test(s) failed
ixp0907-1b      TPD: [ 7.0.1.0.0-86.20.0 ]      IXP: [ 10.1.5.0.0-3.2.0 ]
XB: [ 10.1.5.0.0-3.2.0 ]       0 test(s) failed
ixp0907-1c      TPD: [ 7.0.1.0.0-86.20.0 ]      IXP: [ 10.1.5.0.0-3.2.0 ]
XB: [ 10.1.5.0.0-3.2.0 ]       0 test(s) failed
ixp0907-1d      TPD: [ 7.0.1.0.0-86.20.0 ]      IXP: [ 10.1.5.0.0-3.2.0 ]
XB: [ 10.1.5.0.0-3.2.0 ]       0 test(s) failed
```

Example of a failed test:

```
12:21:48: Analyzing IDB state
12:21:48: >>> Error:  IDB is not in started state (current state X) 12:21:48:
>>> Suggestion: Verify system stability and use 'prod.start' to start the
product
```

8.9 Mediation Server Post-Integration Configuration

This section contains various optional post-integration configuration procedures.

8.9.1 CSV streaming feeds

That procedure is to be followed to integrate a CSV server into an MEDIATION subsystem; such a server is used by the CSV streaming feed feature to store CSV files on a server that is not part of an MEDIATION subsystem.

Note: For the CSV streaming feed feature, instead of using a dedicated server provided by the customer, it is possible to use a PDU server which is part of the current MEDIATION subsystem or which is part of another MEDIATION subsystem (as long as all the servers are in the same LAN).

Note: The following procedures describe how to setup shared directories using the NFS v3 protocol; it may be possible to use NFS v4, but the commands to execute are not described here (you should refer to linux and NFS documentation to learn how to use NFS v4 protocol).

1. Configure the shared directory on the sharing server

   a) Select an existing directory or already mounted local file system in which the exported files will be stored.

      Note: Be sure the shared directory has read/write/execute access rights for MEDIATION's `cfguser` user. If the user `cfguser` also exists on the sharing server, with the same UID as on the MEDIATION servers, create the shared directory as `cfguser` (or mount the local file system in a directory owned by `cfguser`); in any other case, set RWX access rights on the shared directory for everybody.

   b) Update the exports file. As root, execute:

      If the server uses a versioning system like rcstool, first check out the file:

      ```
      # rcstool co /etc/exports
      ```

      Edit /etc/exports and add this line (`<path_to_share>` is the directory or path to file system to share, `<ip_ixp_export>` is the IP address of an MEDIATION server); add as many lines as MEDIATION servers that will remotely access this shared directory

      `<path_to_share>  <ip_ixp_export>(rw,sync,anonuid=-1)`

      If needed, check in the file:

      ```
      # rcstool ci /etc/exports
      ```

   c) Restart the NFS services. As root execute:

```
# chkconfig --levels 345 nfs on
# service rpcbind restart
# service nfs restart
```

2. Mount the shared directory on MEDIATION side

   Note: These steps are to be executed on each MEDIATION server that will remotely access the shared directory of the sharing server.

   a) Create the mount point. As root, execute:
   ```
   # mkdir /var/TKLC/ixp/StoreExport
   # chown cfguser:cfg /var/TKLC/ixp/StoreExport
   ```
   b) Update the fstab file. As root, execute:
   ```
   # rcstool co /etc/fstab
   ```
   Edit /etc/fstab and add this line (`<ip_server_nfs>` is the IP address of the sharing server)

   `<ip_server_nfs>:<path_to_share>  /var/TKLC/ixp/StoreExport nfs rw,rsize=32768,wsize=32768,soft 0 0`
   ```
   # rcstool ci /etc/fstab
   # mount --all
   ```
   c) Restart the NFS services. As root execute:
   ```
   # chkconfig --levels 345 nfs on
   # service rpcbind restart
   # service nfs restart
   ```

Note: The firewall must be disabled on the shared CSV server. If the CSV server is maintained by Oracle(Tekelec) then following steps must be performed to disable the firewall as root user

a) chkconfig --levels 345 iptables off
b) service iptables stop

If the CSV server is not maintained by Oracle then firewall must be disabled or configured to allow the nfs connections.

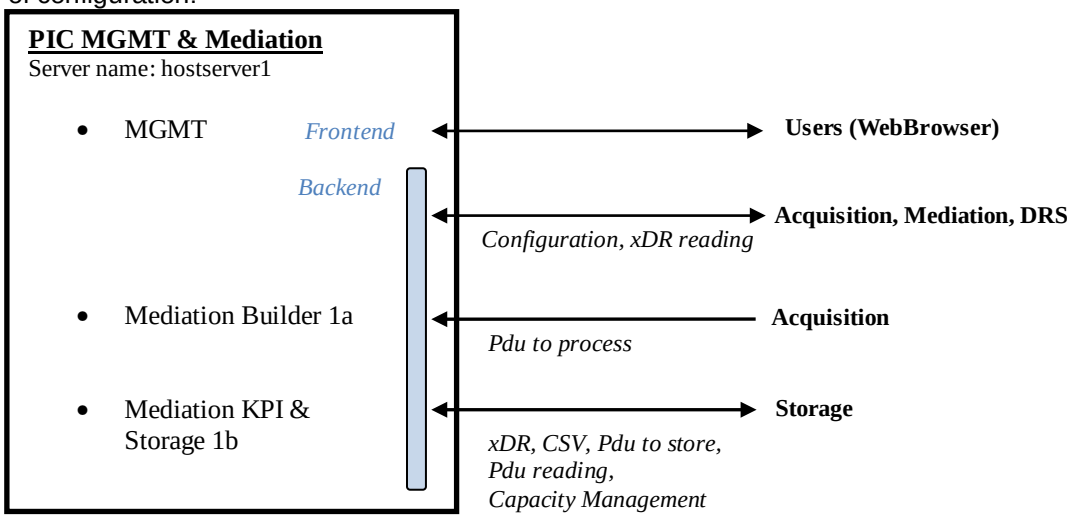
9 MULTIPLE PIC COMPONENTS SHARING THE SAME HW

A single server, Oracle X5-2, X6-2, HP Gen8 or HP Gen9, can host multiple PIC components by virtualizing each one; the number of virtualized components depends on the level/type of traffic to monitor regarding the performance expectation. No other type of server is supported by PIC team.

The supported components for the virtualization on the same server are:

- 1 MGMT server,
- Up to 3 Mediation servers,
- 1 Acquisition server, if the appropriate cards for the traffic capture are settled in the host.

Example of configuration:



Function	Minimum vCPU	Minimum RAM	Minimum HDD	Configuration
Hypervisor	2		200 GB	This disk volume is what remains on the host
Management	2 (*)	64 GB	550 GB (*) (150 GB MGMT, 400 GB oracle).	No. users = 1 to 5 (subject to licensing condition) Capacity Management Session, Alarms & Logs retention must be configured to 5 days, at most
Mediation-1a	4	16 GB	64 GB	N DFPs Builder
Mediation-1b	4	16 GB	64 GB	KPI & xDR Storage

(*) tuning: To apply PIC standard parameters for MGMT, it requires 8 vCPU and 4 times more disk space.

For the detailed installation of such configuration, please refer to the chapter Prepackaged DSR Monitoring.

10 PREPACKAGED DSR MONITORING

10.1 Configuration Overview

This configuration is targeted for DSR Monitoring, for Troubleshooting and/or Accounting on X5-2, X6-2.

DSR is the “Diameter Signaling Router provided by Oracle.

There is one Acquisition/Mediation server per DSR site. One of them is also hosting Management server and a small DRS for the Capacity Management feature. The number of users is limited as per licensing rules.

Both servers are receiving the double of the Network traffic in case of DSR failover. In other words, most of the time, each server is running at half capacity.

For better performance, it is recommended to use two Mediation Virtual Machine (VM) for the Builder processing versus too many DataFlow processing in one VM.

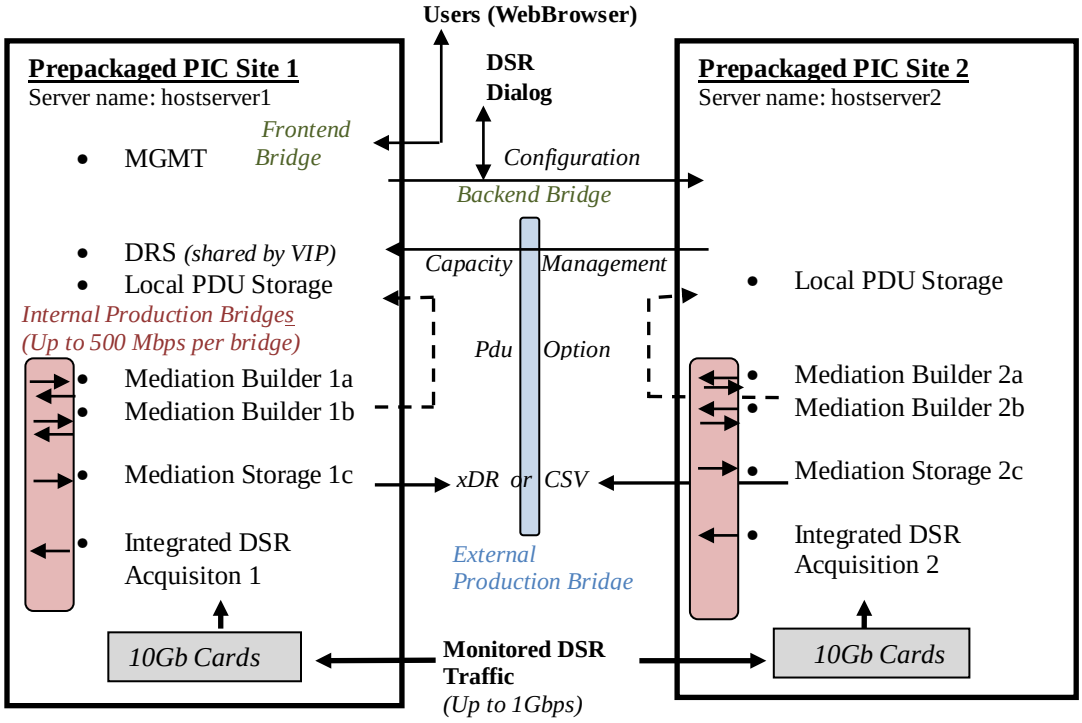
It is also recommended to dedicate a Mediation VM for the Storage processing. KPI processing is not proposed in this configuration for performance reason.

The configuration can be tuned for low traffic but with the minimum of configuration per VM defined in the document PIC Hardware Guidelines docID E66862 (see chapter Reference Documents).

We recommend to follow the proposed configuring for the maximum performance as described below in order to avoid further update in case of traffic increase. Note that changing the configuration could interrupt the DSR Monitoring during all the time of the modifications.

In case of Accounting without Troubleshooting, there is no need of External Data record Storage and no need of PDU Storage.

Two servers must be installed for OCDSR Integrated Acquisition , one on each DSR site.



Two vSwitch bridges are created for Acquisition to the Mediation Builder; another vSwitch bridge is created for the two Mediation Builder to the Mediation Storage.

The hardware of the prepackaged solution allows this configuration parameters:

Function	vCPU	Minimum RAM	Minimum HDD	Configuration
Hypervisor	2		200 GB (*)	(*) This disk volume is what remains on the host
Management, DRS, PDU Storage	2	64 GB	550 GB (150 GB MGMT, 400 GB oracle). 3.6 TB for PDU storage	No. users = 1 to 5 (subject to licensing condition) Capacity Management Session, Alarms & Logs retention must be configured to 5 days, at most Option: PDU Storage for the "Troubleshooting Use Case"
Acquisition	8	16 GB	64 GB	Load Balancing for 12 DFPs.
Mediation-1a	8	16 GB	64 GB	6 DFPs Builder
Mediation-1b	8	16 GB	64 GB	6 DFPs Builder
Mediation-1c	8	16 GB	64 GB	**Accounting Use Case**: 12 DFPs CSV Store **Troubleshooting Use Case**: 12 DFPs xDR Store

This configuration requires a good skill in virtualization environment. You can find some information in Appendix: Virtualization CONSIDERATION but it is not replacing a good experience.

10.2 Configuration Steps

This chapter describes the steps to follow in a scrupulous manner to achieve the configuration in optimized timing.

Note: KVM or VmWare can be used. Examples of commands are provided for KVM.

See the detailed schema provided in the next chapter.

Step	Server	Action	Key points
1	**1 & 2**	**Server Installation** Installation of Oracle Linux, refer to the document Oracle linux on Third-Party Server Installation DocID 2061666.1 (see chapter Reference Documents). At the end of the installation, this server is ready for the Guest installation	Base environment option (see note 1) Enable PCI Pass through mode for the 10GB Acquisition card (see chapter Enable the PCI pass through mode & Identify and detach the 10Gb Ethernet links) Network configuration help (see note 2) for the creation of: • Backend bridge (DRS access) • Frontend bridge (MGMT access) • 3 Internal Production bridges (between VM Acquisition & Mediations) • External Production bridge (CSV, xDR, PDU)
2	**1**	**Management server Guest Installation** Installation of Oracle Linux, refer to the document Oracle linux on Third-Party Server Installation DocID 2061666.1 (see chapter Reference Documents).	Command to create the Management server guest (see note 3). Hostname configuration (see note 4) Default sizing modification (see note 5) Recommandation of database buffer cache sizing (see note 6) Define a disk with minimum 100GB and allocate all for the “NSP daily backup”partition.
3	**1**	**Installation of Oracle ASM**, refer to the document Oracle ASM and database on Third-Party Server Installation DocID 2602491.1 (see chapter Reference Documents).	Define a disk with minimum 400GB and allocate all for oracle ASM.
4	**1**	**Installation of Management server**, refer to the document OCPIC Management Server Installation DocID 2062544.1 (see chapter Reference Documents).	At the end of installation check service status and configure log storage duration (see note 7)

Step	Server	Action	Key points
5	**1**	**Installation of Data record server** on Management server, refer to the document OCPIC Data WhareHouse Server (DWS) Installation DocID 2028670.1 (see chapter Reference Documents).	The IXP database is created with a smallest size (see note 8).
6	**1**	**Add the Data Record storage on the Management** application interface, refer to chapter Add Data Record Storage to Centralized Configuration .	
7	**1**	**Define a Virtual IP Address** on the Data Record storage from the first server, in order to benefit of the Capacity Mangement feature for this second server.	(see note 9)
8	**1 & 2**	**Add the PDU Record storage for the use case "troubleshooting",** refer to the document PIC Packet Data Unit Storage DocID 2034894.1 (see chapter Reference Documents).	Define a disk with minimum 3TB and allocate all for PDU writing (3.6 TB of space Max).
9	**1 & 2**	**Probed Acquisition Guest Installation** Installation Probed Acquisition, refer to the chapter Probed acquisition and after to the chapter Acquisition server application installation procedures.	CPU configuration for Probed guest creation(see note 10) If necessary change network order and modify production network (see note 11). In MGMT, in the Centralized Configuration, declare the production network Prod1 on eth01 (refer to CCM user guide, section "Adding a Production Interface to a Probed Acquisition").
10	**1 & 2**	**Mediation Guest Installation** Installation of each Mediation, refer to the chapter Mediation guest creation and after to the chapter Mediation application installation procedures.	CPU configuration for each Mediation server guest(see note 9). To use internal communication Prod1 and Prod2 for VM Mediation Builders and Prod3 for MediationStorage(see note 12) Once the Mediation server is declared in MGMT, change the Capacity Management session duration to 5 days.
11	**1**	**Dataflows configuration**	(See note 13)
12	**1**	**Storage configuration**	(See note 14)

Notes:

(1) Install Oracle Linux step 2:

a. choose Base environment “Server with GUI” and Add-Ons "Virtualization Client", “Virtualization Hypervisor” and "Virtualization Tools”.

b. The “Manual Partitioning” must be adapted to the available disk space:

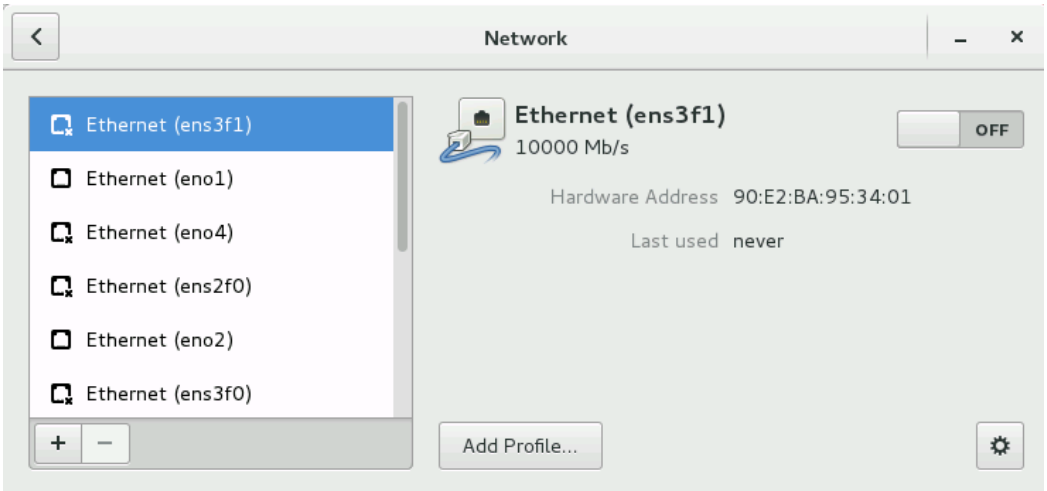
- / 5 GiB
- /boot 500 MiB
- /home 5 GiB
- swap 64 GiB
- /var 1000 GiB (remaining space)

(2) Refer to the chapter “Configure the network bridges” for the general approach

Follow these recommendations for the prepackaged solution.

a. **Backend** bridge

- In order to give access to the “Capacity management” DRS from the Mediation of the second server,you need to add a bridge for the backend IP address. Make sure that no route is configured for this bridge (DEFROUTE=no).
- Through All Settings/Network, the following windows is open:



- With the “+” button you can add a Network Connection and select “Bridge”.
- Give a name to the bridge, e.g “**Backend**” and Add a Bridged Connections, choose “Ethernet”, select the appropriate “Device” and give an IP Address

b. **Frontend** bridge

- Proceed as for the Backend bridge but with DEFROUTE=yes

c. Internal **Production** bridges

- These 3 bridges, named **Prod1**, **Prod2** and **Prod3**, allow **internal** server communication between the VMs. Add no Bridged Connections.
- Proceed as for the Backend bridge but with DEFROUTE=no

d. External **Production** bridge

- This bridge, named **ProdExt**, allows **external** server communication for CSV,xDR and PDU
- Proceed as for the Backend bridge but with DEFROUTE=no

(3) Command to create the Management server guest.

```
virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=Backend,model=virtio --network bridge=Frontend,model=virtio  --network
bridge=Prod3,model=e1000 --cdrom /varl/name_of_iso_Oracle_linux_.iso --disk
path=/var/vm_server/MGMT_name.disk,size=150,sparse=no,bus=ide --name MGMT_name
--ram 64512 --vcpus 2 --graphics vnc --os-variant rhel6
```

(4) Configure in /etc/hosts file the IP address which contain the backend IP address.

(5) Linux installation tuning:

MGMT partitioning	
/opt/nsp	40 GB
/home	20 GB
/opt/oracle11	25 GB
/var/ORCL	10 GB
/boot	500 MB
/usr	10 GB
/	10 GB
Swap	32 GB

MGMT Backup: It is possible to create space for the Backup, like 100GB but it is recommended to store the backup on one other server using nfs share like done for PDU. This other server can be the server of prepackaged of the site 2.

(6) During server configuration put the value 32G for use the extended buffer cache feature:

```
tmpfs                   /dev/shm                tmpfs  size=32G 0 0
```

(7) At the end of installation check nsp and jmx services:

```
systemctl status nspservice
service jmxd status
```

If they aren't running, please start services.

```
systemctl start nspservice
service jmxd start
```

Configure log storage duration, in an sqlplus command:

```
update cor_system_config set ALR_PURGE_DAYS_THRESHOLD = 5;
update cor_system_config set LOG_PURGE_AUDIT_DEPTH = 5;
update cor_system_config set LOG_PURGE_DEPTH = 5;
commit;
```

(8) IXP Database creation

```
CREATE DATABASE IXP
    CONTROLFILE REUSE
    LOGFILE GROUP 1 ('+DATA') SIZE 20G,
        GROUP 2 ('+DATA') SIZE 20G,
```

```
        GROUP 3 ('+DATA') SIZE 20G,
        GROUP 4 ('+DATA') SIZE 20G
    DATAFILE '+DATA' SIZE 500M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
        '+DATA' SIZE 500M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G
        EXTENT MANAGEMENT LOCAL
    SYSAUX DATAFILE '+DATA' SIZE 500M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE
16G,
        '+DATA' SIZE 500M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G
    DEFAULT TEMPORARY TABLESPACE temp
        TEMPFILE '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 8G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 8G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 8G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 8G
            EXTENT MANAGEMENT LOCAL UNIFORM SIZE 10M
    UNDO TABLESPACE undo
        DATAFILE '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G,
            '+DATA' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 16G
    CHARACTER SET AL32UTF8
    SET TIME_ZONE = 'America/New_York';
```

(9) Define a virtual IP address:

```
ip addr add <IP> dev <DEV>
```

where <IP> is the virtual IP address and <DEV> is the network device name (eg: eth0, eno1678032…)

(10)For Probe and Mediation guest we recommend to set vcpu to physical CPU to increase performance.

Eg: `--vcpus 8,cpuset=3-10` (this guest use the physical CPU 3 to 10).

Linux command for Acquisition VM:

```
virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=Backend,model=virtio --network bridge=Prod1,model=e1000 --network
bridge=Prod2,model=e1000 --host-device pci_0000_03_00_0,rom_bar=off --host-
device pci_0000_03_00_1,rom_bar=off --cdrom /var/ORCL/TPD.install-
7.0.3.0.0_86.40.0-OracleLinux6.7-x86_64.iso --disk
path=/var/vm_server/VM_PMF_0a.disk,size=64,sparse=no,bus=ide --name VM_PMF_0a -
-ram 16384 --vcpus 8,cpuset=3-10 --graphics vnc --os-variant rhel6
```

Linux command for first Mediation VM:

```
virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=Backend,model=virtio --network bridge=ProdExt,model=virtio --network
bridge=Prod1,model=e1000 --network bridge=Prod3,model=e1000 --cdrom
/varl/ORCL/TPD.install-7.0.3.0.0_86.40.0-OracleLinux6.7-x86_64.iso --disk
path=/var/vm_server/VM_IXP_1a.disk,size=64,sparse=no,bus=ide --name VM_IXP_1a -
-ram 16384 --vcpus 8,cpuset=11-18 --graphics vnc --os-variant rhel6
```

Linux command for second Mediation VM:

```
virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=Backend,model=virtio --network bridge=ProdExt,model=virtio --network
bridge=Prod2,model=e1000 --network bridge=Prod3,model=e1000 --cdrom
/var/ORCL/TPD.install-7.0.3.0.0_86.40.0-OracleLinux6.7-x86_64.iso --disk
```

```
path=/var/vm_server/VM_IXP_1b.disk,size=64,sparse=no,bus=ide --name VM_IXP_1b -
-ram 16384 --vcpus 8,cpuset=19-26 --graphics vnc --os-variant rhel6
```

Linux command for last Mediation VM:

```
virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=Backend,model=virtio --network bridge=ProdExt,model=virtio --network
bridge=Prod3,model=virtio --cdrom /var/ORCL/TPD.install-7.0.3.0.0_86.40.0-
OracleLinux6.7-x86_64.iso --disk
path=/varl/vm_server/VM_IXP_1c.disk,size=64,sparse=no,bus=ide --name VM_IXP_1c
--ram 16384 --vcpus 8,cpuset=27-34 --graphics vnc --os-variant rhel6
```

(11) Caution during TPD installation from a virtual Probed Acquisition the order of network declaration is modified. Change the device name in the file /etc/udev/rules.d/70-persistent-net.rules to have eth0 for the Backend bridge, eth01 for the Production bridge Prod1, eth02 for the Production bridge Prod2 (and acquisition network on eth1, eth2…). Production bridge Prod1 must be called eth01 otherwise it is not possible to configure Production network under Centralized Configuration from Management server.

Change the network devices' name:

```
rcstool co /etc/udev/rules.d/70-persistent-net.rules
```

Do the expected changes in the file /etc/udev/rules.d/70-persistent-net.rules, then:

```
rcstool ci /etc/udev/rules.d/70-persistent-net.rules

udevadm control --reload

udevadm control --reload-rules

udevadm trigger

reboot
```

(12) Mediation internal communication

a. If you choose to use the PDU Record storage deployed on the Management server (the "Troubleshooting" use case), don't forget to use, in the Bulkconfig file, for the PDU storage, the IP address of the Management server in the external Production network ProdExt.

   On the Management server, in /etc/hosts file, be sure to put the IP address of the Mediation servers in the external Production network ProdExt, otherwise the Mediation servers won't be allowed to connect to the PDU shared directory.

b. At the end of Mediation installation, modify file /etc/hosts so mediation servers can communicate on the internal Production network Prod3.

   In /etc/hosts, replace the IP address of the **other** mediation servers by their IP address in the internal Production network Prod3, and restart the IXP service.

   Below an example of /etc/hosts file from mediation server 1c:

```
[root@ixp1200-1c ~]# cat /etc/hosts
127.0.0.1   localhost localhost4 localhost4.localdomain4
::1         localhost localhost6 localhost6.localdomain6
10.31.1.160       ntpserver1
10.31.2.56        nsp_oracle nsp_primary nsp_secondary  (Backend network)
192.168.123.3     ixp1200-1a 1a                         (Internal Production network Prod3)
192.168.123.4     ixp1200-1b 1b                         (Internal Production network Prod3)
10.31.2.57        ixp1200-1c 1c                         (Backend network)
```

(13) Dataflows Configuration

a. Configure the 12 Dataflows Load Balancing on Acquisition side. Be sure to modify the PDU filter DIA_LS_MAX depend of max load sharing destinations that you need and add to filters DIA_PORTS ports values, depending on customer site.

b. Create the 6 Dataflows per Mediation, call them “Dia_<X><Y>”, where <X> is the Mediation server number (1 for the first Mediation server and 2 for the second) and <Y> is the DFP number (from 1 to 6); select the builder “LTE Diameter TDR Reconstitution” with its default parameters and the following tuning:

   i. in IP Transport for item “Builders Subscriptions” of IMS Diameter, add the potential specific port values, depending of customer site

   ii. in IP Transport for “List of servers ports known” of Diameter, add the potential specific port values, depending of customer site

   iii. in IMS Diameter Decoding, select the “Activate Optimized Diameter Mode” to processs all type of Diameter interfaces.

   Note: for each Mediation server, the 6 dataflows will use the production network declared in the Centralized Configuration (this is Prod1 on eth01), but for the second Mediation server, they should use the production network Prod2; this can only be changed with SQL commands to run on the MGMT database. Use sqlplus command line:

```
update cfg_ixp_stream set ip_address1='<Prod2IP>' where datasource_id in
(select datasource_id from cfg_datasource where name like 'Dia_2%');

commit;
```

   where ***<Prod2IP>*** is the IP address of the Acquisition server in the Production network Prod2.

(14)Storage Configuration

a. Use Case “Accounting”

   i. Activate the CSV option on Management Server

   ii. Create the 12 Storages DFP by selecting the “Storage Type” = CSV Files

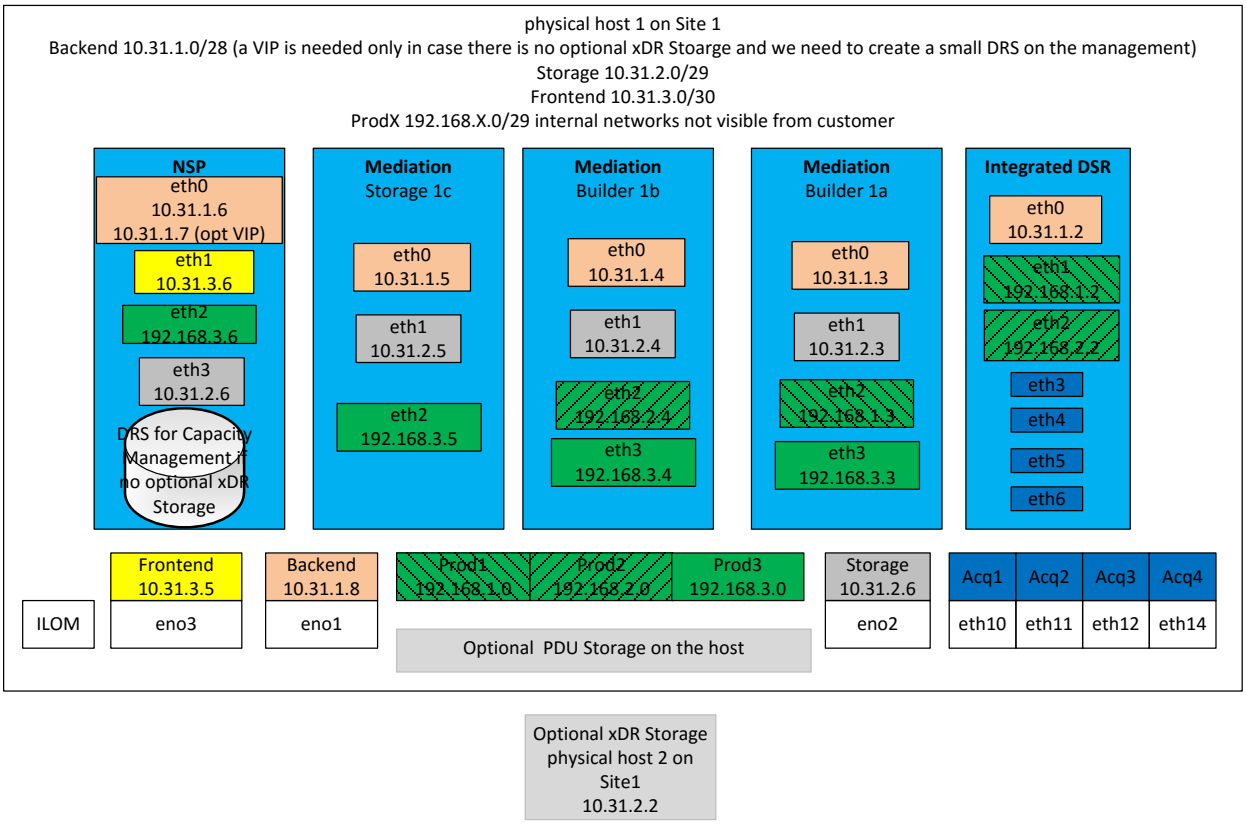
b. Use Case “Troubleshooting”

   Create the 12 Storages DFP by selecting the “Storage Type” = Datawarehouse

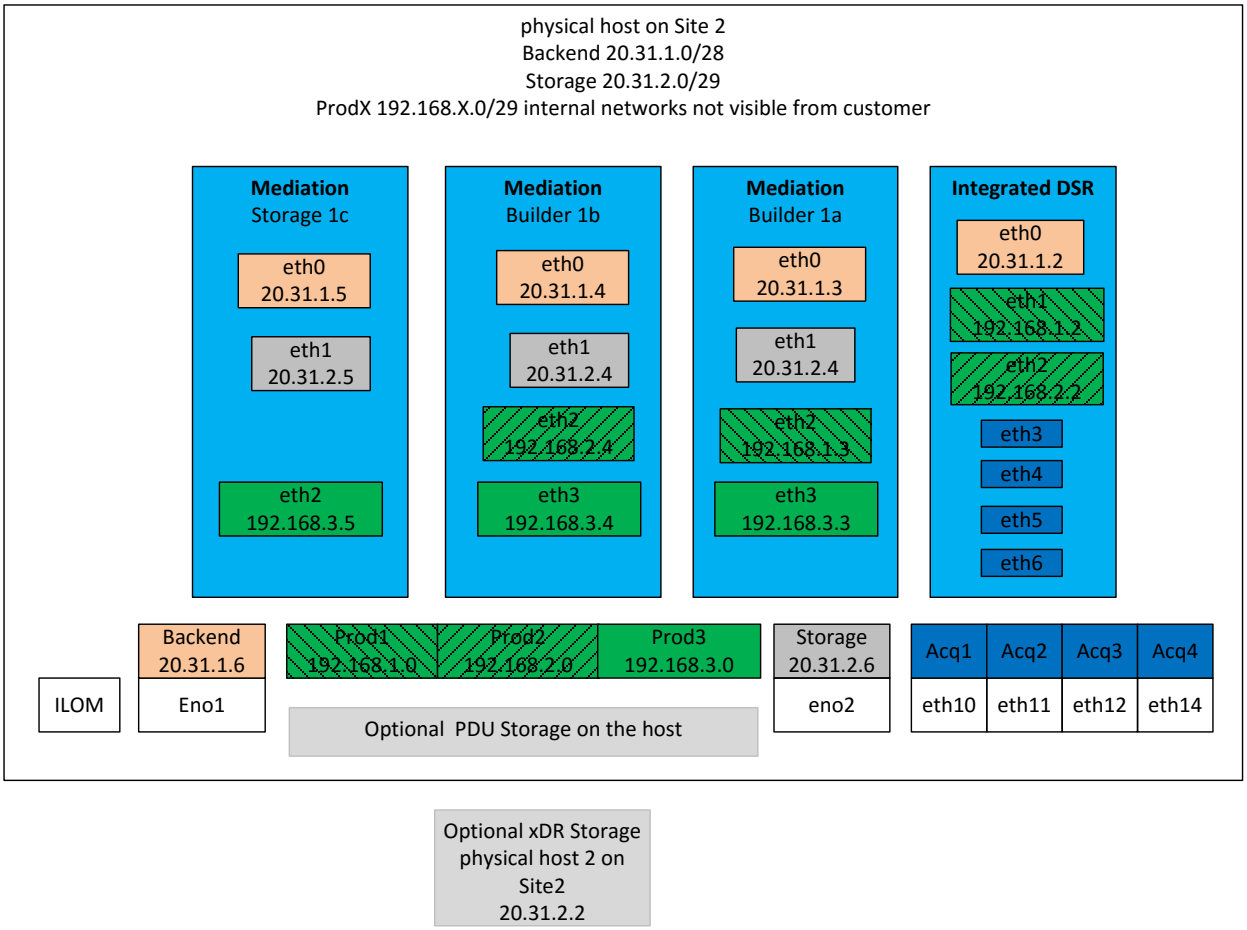
10.3 Detailed Schema

Here is a detailed representation of the prepackaged DSR Monitoring.

10.3.1 Site 1



10.3.2 Site 2



Optional xDR Storage physical host 2 on Site2
20.31.2.2

11 APPENDIX: VIRTUALIZATION CONSIDERATION

11.1 Host configuration

The server that will host the VMs needs to comply to the minimal H/W requirements for a virtualized Mediation server and/or a virtualized Probed Acquisition server.

Hyperthreading is not recommended for OCPIC Acquisition and Mediation.

The host is installed with the Oracle Linux 7.1:

- As base environment, choose Server with GUI and select the VM related additional package sets "Virtualization Client", "Virtualization Hypervisor", "Virtualization Tools";
- Plan to spare some disk space for the guests;
- Create a bridge on the primary network interface;
- Don't forget to set a host name (on the network configuration page);
- Setup time zone, time and NTP; (all NTP guests service should be configured to be synchronized to the host NTP service)
- There is no need for an additional user.

Refer to the Oracle Linux 7 Installation Guide in E52668_01 to learn how to install and configure the host.
Once the OS is installed, don't forget to configure the NTP service (ntpd daemon or chronyd daemon) and the firewall to allow the host to act as an NTP server for its guests (refer to the Oracle Linux 7 Administrator's Guide in E52668_01).

11.2 Probed acquisition

11.2.1 Enable the PCI pass through mode

This mode is required when 10Gb Ethernet links are to be directly handled by a Probed Acquisition guest. Execute the following procedure to enable the PCI pass through mode:

- open a ssh console on the host as `root`
- edit the file `/etc/default/grub`
- look for a line starting with the `GRUB_CMDLINE_LINUX` keyword
- at the end of that line, before the closing quotes, add a space character and append `intel_iommu=on`
- save the file
- run the command to update the bootloader:
  `grub2-mkconfig -o /boot/grub2/grub.cfg`
- reboot the host

11.2.2 Configure the network bridges

Use the bridge created at installation time (on the primary physical interface) as the management network (it will be used as the first network interface of the VMs); create a new private bridge not attached to any physical network interface (it will be used as the second network interface of the guests, for the production network); it is possible to use either the predefined `virbr0` bridge or physical Ethernet links (see next sections for using dedicated physical network interfaces) for the capture interfaces (they will be used as third, fourth… network interfaces of the Probed Acquisition guest).

11.2.3 Identify and detach the 10Gb Ethernet links

If a Probed Acquisition guest is planned to control the 10Gb Ethernet links, those links need to be identified by their bus, slot and function. Proceed as follows:

- open a ssh console on the host as `root`

- use the `lspci` command in conjunction with a `grep` command to identify the 10Gb Ethernet links. Eg:

```
# lspci|grep SFP
03:00.0 Ethernet controller: Intel Corporation 82599ES 10-Gigabit
SFI/SFP+ Network Connection (rev 01)
03:00.1 Ethernet controller: Intel Corporation 82599ES 10-Gigabit
SFI/SFP+ Network Connection (rev 01)
13:00.0 Ethernet controller: Intel Corporation 82599ES 10-Gigabit
SFI/SFP+ Network Connection (rev 01)
13:00.1 Ethernet controller: Intel Corporation 82599ES 10-Gigabit
SFI/SFP+ Network Connection (rev 01)
```

- take note of the bus, slot and function of each 10Gb Ethernet link. In the previous example, for the 1st link, the bus is 03, the slot is 00 and the function is 0.

Detaching the 10Gb Ethernet link devices is a prerequisite to attach the links in a dedicated guest. Proceed as follows to detach a device:

- open a ssh console on the host as `root`
- use the `virsh` command in conjunction with a `grep` command to get the device ID. For the 1st Ethernet link of the previous example, use the following command, where bus, slot and function are used as the `grep` argument:

```
# virsh nodedev-list|grep 'pci.*03_00_0$'
pci_0000_03_00_0
```

- then, use the previously found ID to detach the device with the following command:

```
# virsh nodedev-detach pci_0000_03_00_0
Device pci_0000_03_00_0 detached
```

- repeat both previous steps to detach the remaining devices

11.2.4 Probed acquisition guest creation

In order to create the Probed Acquisition guest or to reinstall the OS, the ISO file of the TPD used for IPM is needed on the host.

Note: the following procedures are to be executed from the graphical desktop of the host.

11.2.4.1 Guest creation

Use this procedure when a new guest is to be created (the next section explains how to reinstall the OS on an existing guest):

- open an X terminal as root
- the following arguments are to be provided to the `virt-install` command:
  - Virtualization mode: `--virt-type kvm --hvm --connect qemu:///system`
  - Network interfaces (keep the order):
    - Management: `--network bridge=<mgmt_br>,model=virtio`
    - Production: `--network bridge=<prod_br>,model=virtio`
    - Capture (use anyone of the 2 options, multiple times if required, and once for each capture interface):
      - 10Gb Ethernet links detached from host: `--host-device <pci_device_id>,rom_bar=off`
      - Non-detached links: `--network type=direct,source=<phys_itf>,source_mode=passthrough,model=virtio`
  - Boot order: `--boot cdrom,hd`
  - CD drive: `--cdrom <tpd_iso_file>`

- Disk: `--disk path=<disk_file>,size=<disk_size>,sparse=no,bus=ide`
- VM name: `--name <vm_name>`
- RAM: `--memory <ram_size>`
- CPU: `--vcpus <cpu_count>,cpuset=auto`
- Display: `--graphics vnc`
- VM optimization: `--os-variant rhel6`

where

- *<mgmt_br>* is the name of the network bridge used for the management network
- *<prod_br>* is the name of the network bridge used for the production network
- *<pci_device_id>* is the identifier (of the capture network interface) used in the `virsh nodedev-detach` command
- *<phys_itf>* is the name of the network device used for the capture network
- *<tpd_iso_file>* is the full path and name of the TPD ISO file
- *<disk_file>* is the full path and name of the disk file (be sure to create it on a file system having enough space)
- *<disk_size>* is the size (in GB) of the disk to create
- *<vm_name>* is the name of the VM (preferably use letters, digits, underscores and hyphens)
- *<ram_size>* is the size (in GB) of RAM to allocate to the VM; do not over allocate as the host itself and all of the guests will use RAM
- *<cpu_count>* is the number of CPU to allocate to the VM; do not over allocate as the host itself and all of the guests will use CPU

Example with 2 capture interfaces (10Gb network interfaces detached from host):

```
# virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=mgmtbr,model=virtio --network bridge=prodbr,model=virtio --host-
device pci_0000_03_00_0,rom_bar=off --host-device
pci_0000_03_00_1,rom_bar=off --boot cdrom,hd --cdrom
/vm_data/isos/TPD.install-7.0.2.0.0_86.28.0-OracleLinux6.6-x86_64.iso -
-disk path=/vm_data/vms/VM_PMF_0a.disk,size=64,sparse=no,bus=ide --name
VM_PMF_0a --ram 8192 --vcpus 4,cpuset=auto --graphics vnc --os-variant
rhel6
```

- a window with the guest's main console should pop up: proceed with the standard Probed Acquisition installation (choose `TPDnoraid console=tty0` as boot arguments). Take care of network interfaces name: `eth0` is the management, `eth1` is for the production and `eth2`, `eth3`… are the capture interfaces. Take also care of using the host as the NTP server.
- **For better performance it is preconized to set the cpu pinning for the probe guest** (refer to Chapter Cpu Tuning)

11.2.4.2 Guest OS reinstallation

Use this procedure when the OS is to be reinstalled on an existing guest (the previous section explains how to create a new guest):

- open an X terminal as `root`
- reinstall the OS on the existing guess:
  - open the guest's console: `virt-viewer <vm_name> &`
  - find the target name of the CDROM device (get the value in the Target column, on the cdrom line): `virsh domblklist <vm_name> --details`
  - attach the OS disk: `virsh attach-disk <vm_name> <tpd_iso_file> <target> --type cdrom --mode readonly`
  - reboot the guest: `virsh reboot <vm_name>`

where

- *<vm_name>* is the name of the VM
- *<tpd_iso_file>* is the full path and name of the TPD ISO file
- *<target>* is the target name of the CDROM device on the VM

Example:

```
# virt-viewer VM_PMF_0a &
# virsh domblklist VM_PMF_0a --details
Type       Device     Target     Source
-----------------------------------------------
file       disk       hda        /vm_data/vms/VM_PMF_0a.disk
block      cdrom      hdb        -
# virsh attach-disk VM_PMF_0a /vm_data/isos/TPD.install-
7.0.2.0.0_86.28.0-OracleLinux6.6-x86_64.iso hdb --type cdrom --mode
readonly
# virsh reboot VM_PMF_0a
```

- in the guest's console, proceed with the standard Probed Acquisition installation (choose `TPDnoraid console=tty0` as boot arguments). Take care of network interfaces name: `eth0` is the management, `eth1` is for the production and `eth2`, `eth3`… are the capture interfaces. Take also care of using the host as the NTP server.

  Note: after the server has rebooted, it might be possible that the TPD ISO has not been ejected. In this case, the ISO has to be manually ejected and the server restarted. Example:

```
# virsh destroy VM_PMF_0a
# virsh change-media VM_PMF_0a hdb --eject
# virsh start VM_PMF_0a
```

11.3 Mediation guest creation

In order to create the Mediation guest or to reinstall the OS, the ISO file of the TPD used for IPM is needed on the host.

Note: the following procedures are to be executed from the graphical desktop of the host.

11.3.1 Guest creation

Use this procedure when a new guest is to be created (the next section explains how to reinstall the OS on an existing guest):

- open an X terminal as `root`
- the following arguments are to be provided to the `virt-install` command:
  - Virtualization mode: `--virt-type kvm --hvm --connect qemu:///system`
  - Network interfaces (keep the order):
    - Management: `--network bridge=<mgmt_br>,model=virtio`
    - Production: `--network bridge=<prod_br>,model=virtio`
  - Boot order: `--boot cdrom,hd`
  - CD drive: `--cdrom <tpd_iso_file>`
  - Disk: `--disk path=<disk_file>,size=<disk_size>,sparse=no,bus=ide`
  - VM name: `--name <vm_name>`
  - RAM: `--memory <ram_size>`
  - CPU: `--vcpus <cpu_count>,cpuset=auto`
  - Display: `--graphics vnc`
  - VM optimization: `--os-variant rhel6`

  where

  - *<mgmt_br>* is the name of the network bridge used for the management network

- <*prod_br*> is the name of the network bridge used for the production network
- <*tpd_iso_file*> is the full path and name of the TPD ISO file
- <*disk_file*> is the full path and name of the disk file (be sure to create it on a file system having enough space)
- <*disk_size*> is the size (in GB) of the disk to create
- <*vm_name*> is the name of the VM (preferably use letters, digits, underscores and hyphens)
- <*ram_size*> is the size (in GB) of RAM to allocate to the VM; do not over allocate as the host itself and all of the guests will use RAM
- <*cpu_count*> is the number of CPU to allocate to the VM; do not over allocate as the host itself and all of the guests will use CPU

Example:

```
# virt-install --virt-type kvm --hvm --connect qemu:///system --network
bridge=mgmtbr,model=virtio --network bridge=prodbr,model=virtio --boot
cdrom,hd --cdrom /vm_data/isos/TPD.install-7.0.2.0.0_86.28.0-
OracleLinux6.6-x86_64.iso --disk
path=/vm_data/vms/VM_IXP_1a.disk,size=64,sparse=no,bus=ide --name
VM_IXP_1a --ram 8192 --vcpus 4,cpuset=auto --graphics vnc --os-variant
rhel6
```

- a window with the guest's main console should pop up: proceed with the standard Mediation installation (choose `TPDnoraid console=tty0` as boot arguments). Take care of the network interfaces name: `eth0` is the management and `eth1` is for the production. Take also care of using the host as the NTP server.
- For better performance you can set the cpu pinning for the guest (refer to Chapter Cpu Tuning)

11.3.2 Guest OS reinstallation

Use this procedure when the OS is to be reinstalled on an existing guest (the previous section explains how to create a new guest):

- open an X terminal as `root`
- reinstall the OS on the existing guess:
  - open the guest's console: `virt-viewer <vm_name> &`
  - find the target name of the CDROM device (get the value in the Target column, on the cdrom line): `virsh domblklist <vm_name> --details`
  - attach the OS disk: `virsh attach-disk <vm_name> <tpd_iso_file> <target> --type cdrom --mode readonly`
  - reboot the guest: `virsh reboot <vm_name>`

  where
  - <*vm_name*> is the name of the VM
  - <*tpd_iso_file*> is the full path and name of the TPD ISO file
  - <*target*> is the target name of the CDROM device on the VM

  Example:

```
# virt-viewer VM_IXP_1a &
# virsh domblklist VM_IXP_1a --details
Type       Device     Target     Source
-----------------------------------------------
file       disk       hda        /vm_data/vms/VM_IXP_1a.disk
block      cdrom      hdb        -
# virsh attach-disk VM_IXP_1a /vm_data/isos/TPD.install-
7.0.2.0.0_86.28.0-OracleLinux6.6-x86_64.iso hdb --type cdrom --mode
readonly
# virsh reboot VM_IXP_1a
```

- in the guest's console, proceed with the standard Mediation installation (choose `TPDnoraid console=tty0` as boot arguments). Take care of the network interfaces name: `eth0` is the management and `eth1` is for the production. Take also care of using the host as the NTP server.

  Note: after the server has rebooted, it might be possible that the TPD ISO has not been ejected. In this case, the ISO has to be manually ejected and the server restarted. Example:

```
# virsh destroy VM_IXP_1a
# virsh change-media VM_IXP_1a hdb --eject
# virsh start VM_IXP_1a
```

11.4 Tuning CPU affinity on running guests

There may be times where modifying CPU affinities on running guests is preferable to rebooting the guest. The **virsh vcpuinfo** and **virsh vcpupin** commands can perform CPU affinity changes on running guests.

The **virsh vcpuinfo** command gives up to date information about where each virtual CPU is running.

In this example, **guest1** is a guest with four virtual CPUs is running on a KVM host.

```
# virsh vcpuinfo guest1
VCPU:           0
CPU:            3
State:          running
CPU time:       0.5s
CPU Affinity:   yyyyyyyy
VCPU:           1
CPU:            1
State:          running
CPU Affinity:   yyyyyyyy
VCPU:           2
CPU:            1
State:          running
CPU Affinity:   yyyyyyyy
VCPU:           3
CPU:            2
State:          running
CPU Affinity:   yyyyyyyy
```

The **virsh vcpuinfo** output (the **yyyyyyyy** value of **CPU Affinity**) shows that the guest can presently run on any CPU.

To lock the virtual CPUs to the second NUMA node (CPUs four to seven), run the following commands.

```
# virsh vcpupin guest1 0 4
# virsh vcpupin guest1 1 5
# virsh vcpupin guest1 2 6
# virsh vcpupin guest1 3 7
```

A check can be done by.

```
# virsh vcpupin  guest1
VCPU: CPU Affinity
----------------------------------
   0: 4
   1: 5
   2: 6
   3: 7
```

12 APPENDIX: MANUAL CONFIGURATION OF ETHERNET INTERFACES

STEP #		
	In this section you will be configuring the Ethernet interfaces in preparation to test them. You will be configuring the IP address, Netmask, Gateway for the interfaces on each TPD HP based server. If the final customer network and IP address information is not available at the time of this configuration, a default IP address for each server should be provided. **Prerequisites**: - The servers are loaded with TPD - The HP ProLiant servers will need to be connected to a KVM for access. Notes: Within the Platform Configuration Utility, the arrow and Tab keys on your keyboard can be used to move the cursor to different fields.	
1	Login to the server	Once the server completes the reboot from the ILO configuration process in the previous section, you should see a login prompt. Login as User: **root** and refer to TR006061 for the default "TPD root" password CentOS release 5.4 (Final) Kernel 2.6.18-164.11.1.el5prerel4.1.0_70.47.0 on an i686 hostname1292568493 login: root Password: Last login: Fri Dec 17 04:39:24 on tty1 [root@hostname1292568493 ~]# **Expected Result:** Login prompt is displayed and you are logged in as root.

1. Using command line procedure

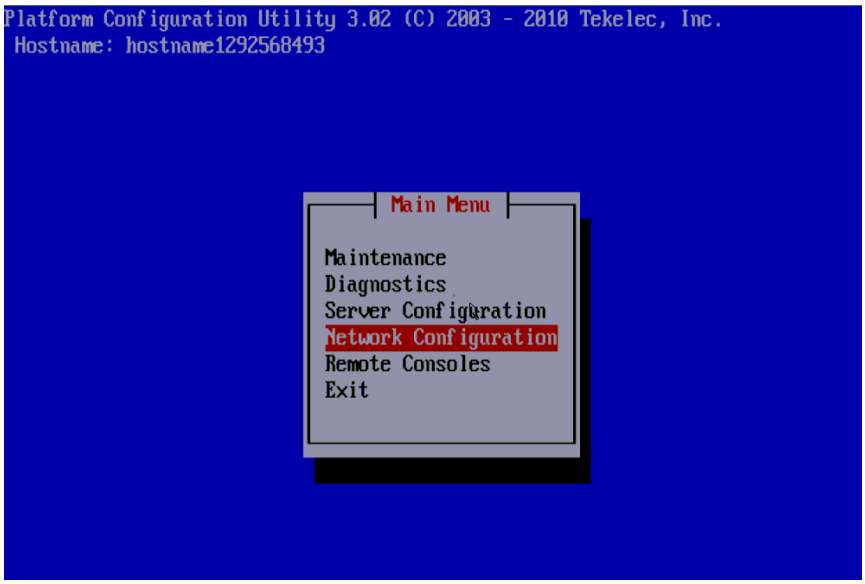
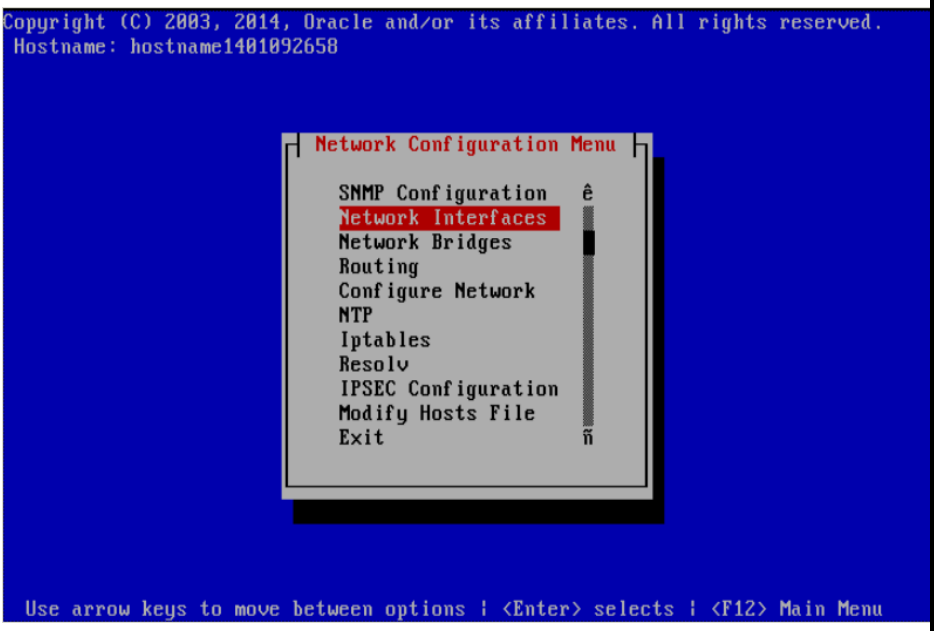
If you Prefer to configure using the graphical interface skip this procedure and use the following platcfg menu procedure

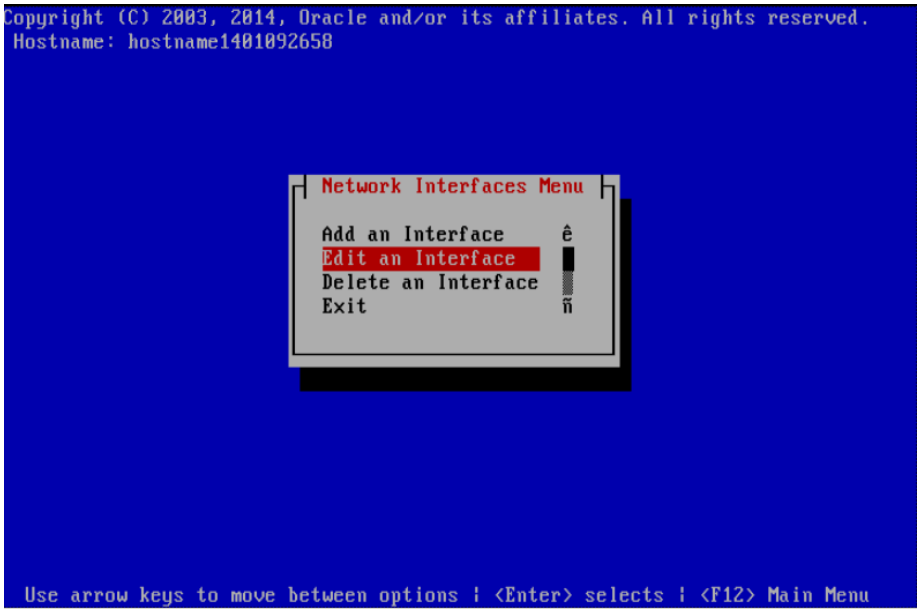
2	Set the IP address and Netmask identified for the eth01 interface	**Command:** **# ifconfig *eth01* <CUST IP ADDRESS> netmask <MASK>** # **Expected Result:** No error after executing the command
3	Set the default Route Gateway IP address for the eth01 interface	**Command:** **# route add default gw <DEFAULT ROUTE IP ADDRESS>** # **Expected Result:** No error after executing the command
4	Configure remaining servers in frame	**Repeat Steps 1 through 3 for each equipped HP server.**

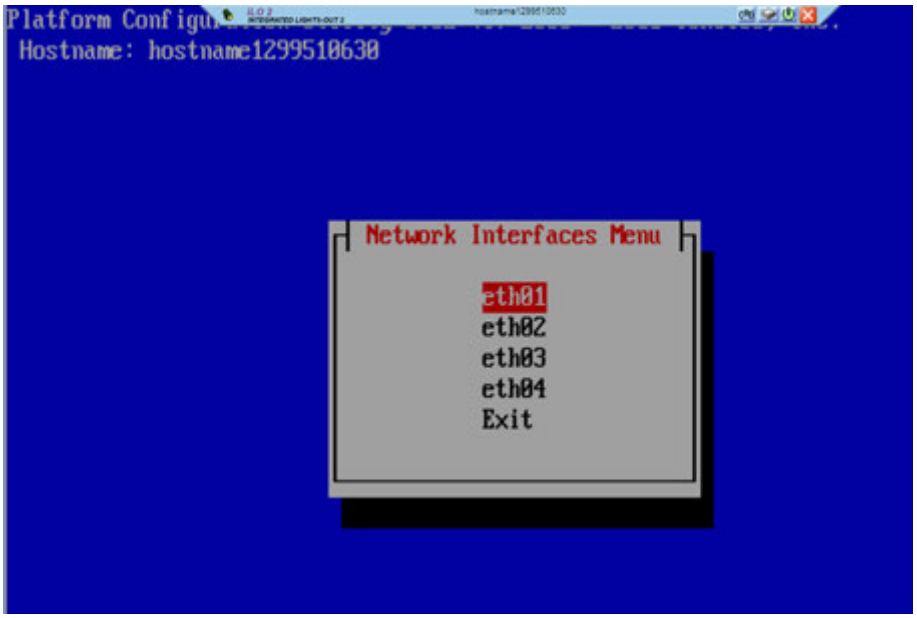
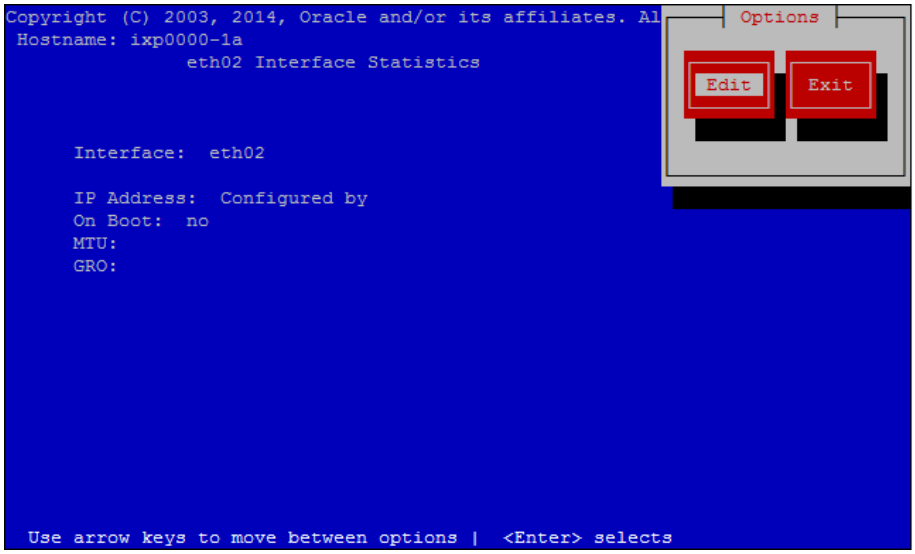
2. Using platcfg menu procedure

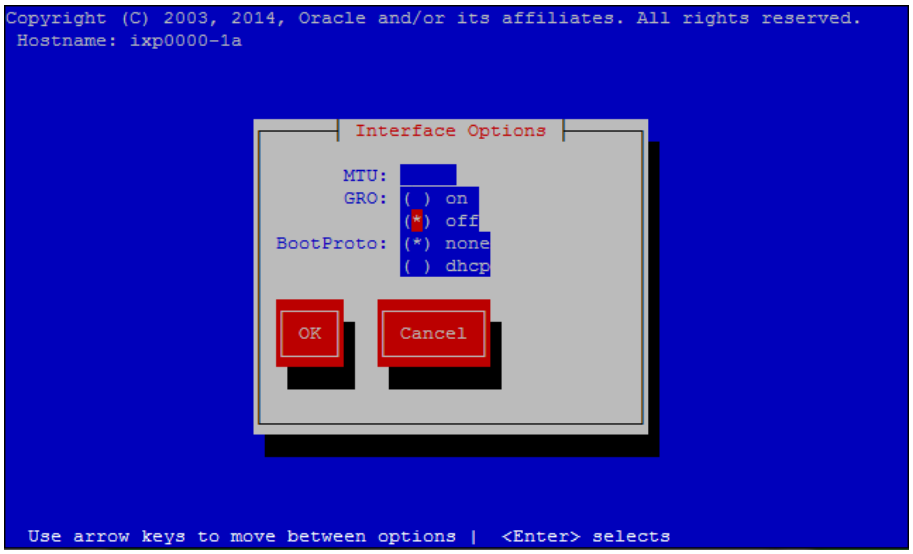
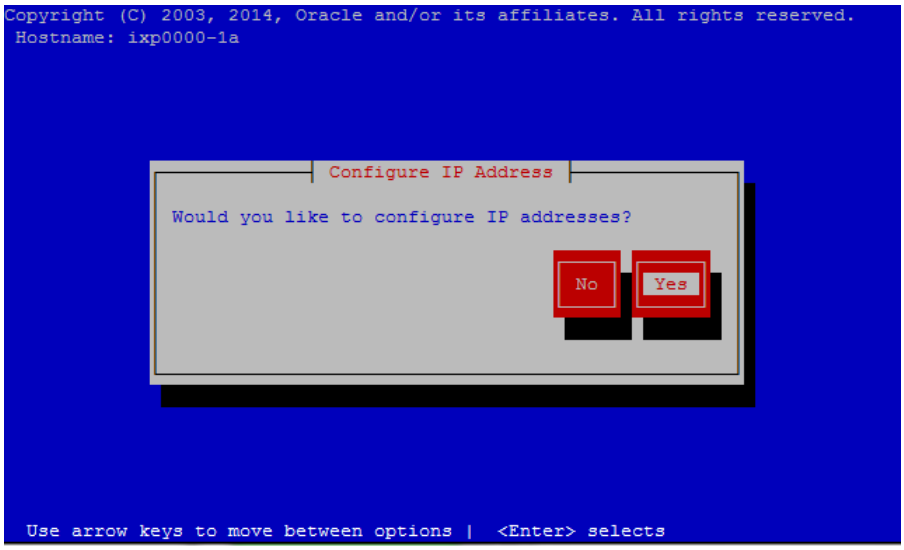
If you configures IP using the command line following the previous procedure, you can skip this procedure is alredy completed

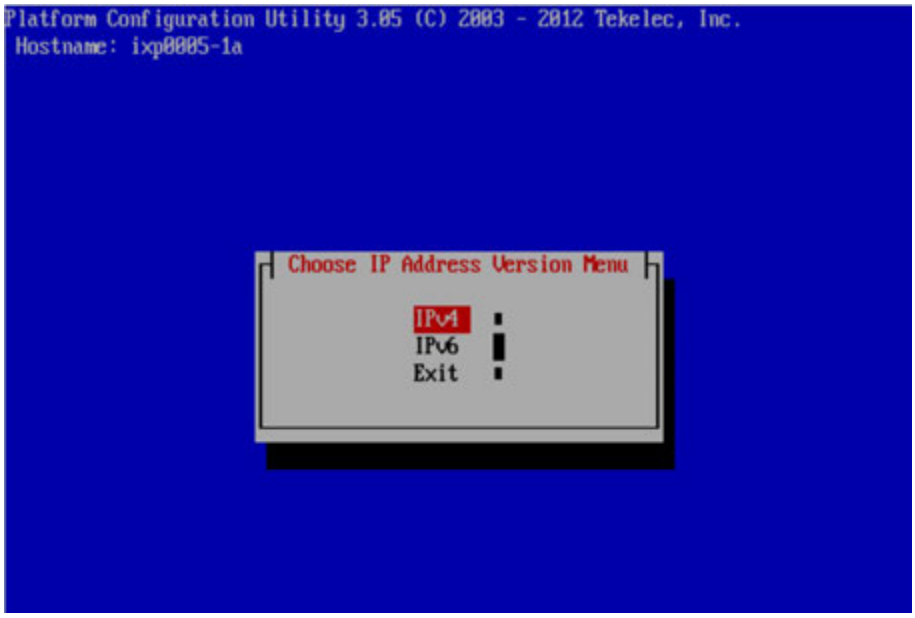
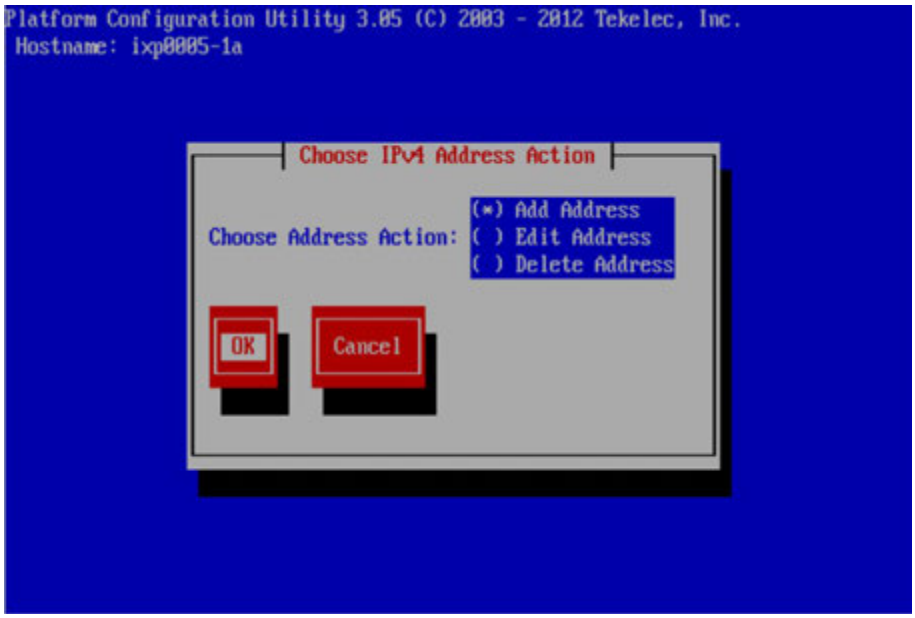
2	Enter the Platform Configuration Utility	To enter the Platform Configuration Utility menu enter: **su – platcfg** CentOS release 5.4 (Final) Kernel 2.6.18-164.11.1.el5prerel4.1.0_70.47.0 on an i686 hostname1292568493 login: root Password: Last login: Fri Dec 17 04:39:24 on tty1 [root@hostname1292568493 ~]# su - platcfg_
3	Enter the Platform Configuration Utility	Platform Configuration Utility 3.02 (C) 2003 - 2010 Tekelec, Inc. Hostname: hostname1292568493 Main Menu Maintenance Diagnostics Server Configuration Network Configuration Remote Consoles Exit **Expected Result:** Main Menu of Platform Configuration Utility is displayed

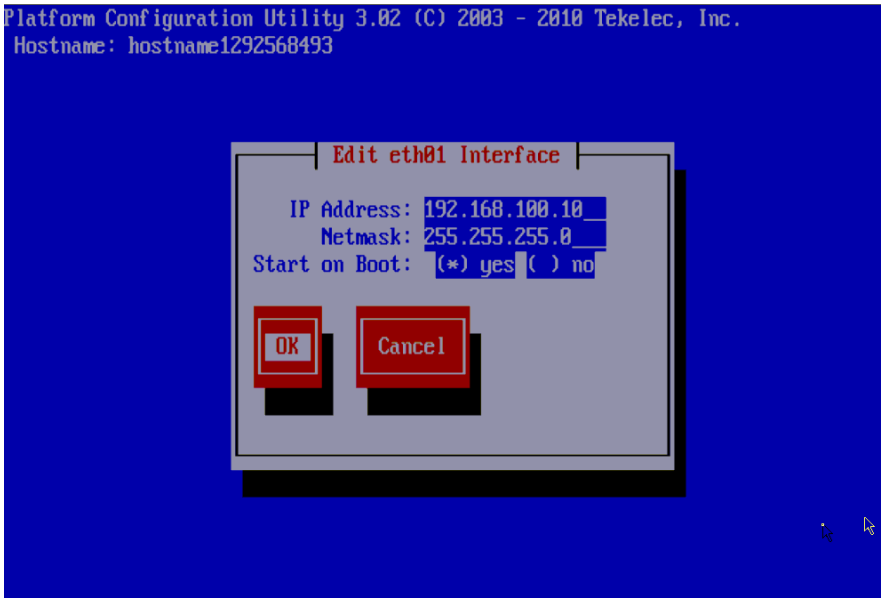
4	Enter the Network Configuration menu of the Platform Configuration Utility	**Main Menu** of Platform Configuration Utility is displayed. Use the arrow keys on the keyboard to select **Network Configuration** and press [ENTER] to select it.  **Expected Result:** The Network Configuration menu is displayed
5	Enter the Network Interfaces menu	Use the arrow keys on the keyboard to select **Network Interfaces** and press **[ENTER]** to select it.  **Expected Result:** The Network Interfaces menu is displayed

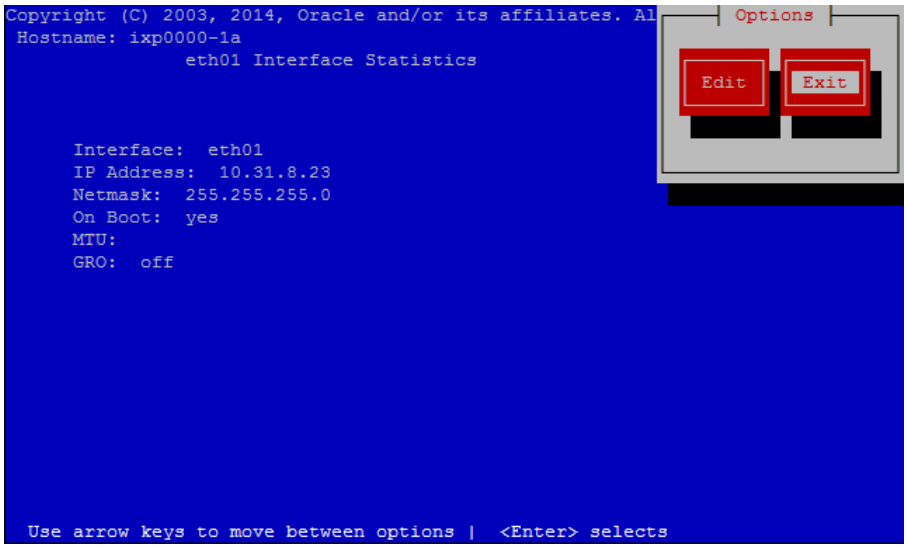
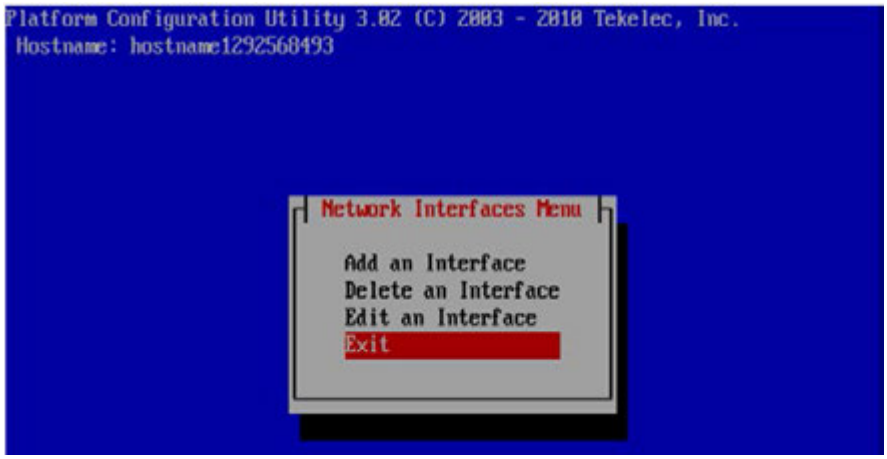
6	Enter the Edit an Interface menu	Use the arrow keys on the keyboard to select **Edit an Interface** and press **[ENTER]** to select it.  **Expected Result:** The Network Interfaces menu is displayed with interface choices eth01 and eth02

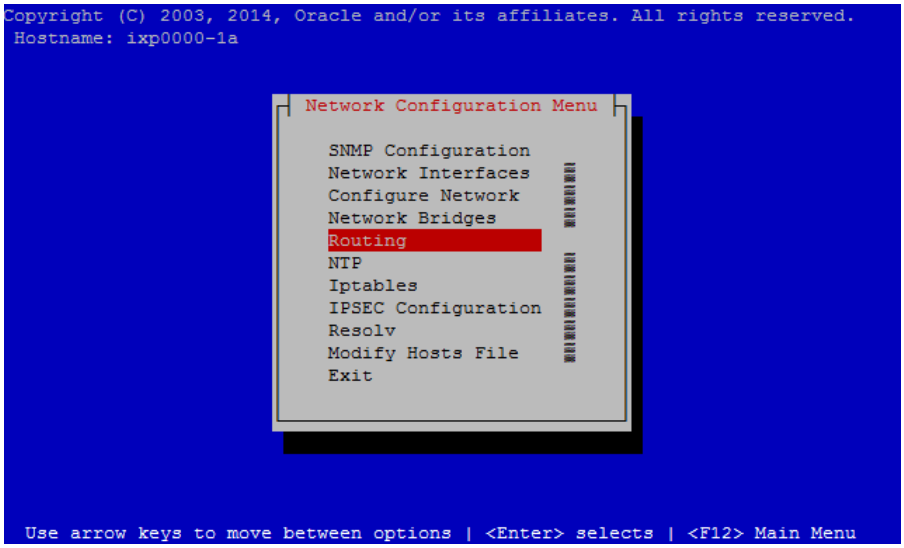
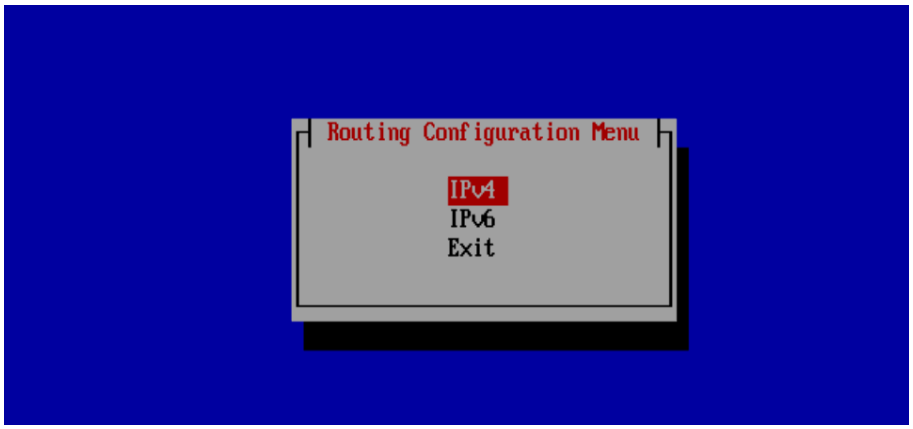
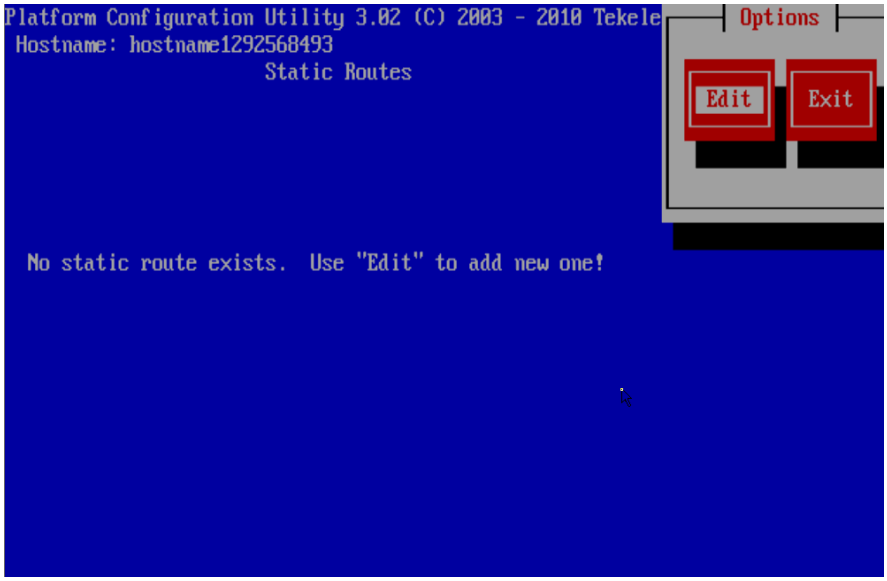
7	Edit the eth01 interface properties	Use the arrow keys on the keyboard to select **eth01** and press **[ENTER]** to select it.  **Expected Result:** The eth01 interface is selected and you are presented with **eth01 Interface Statistics**.  Press the **[ENTER]** key to Edit the properties of eth01. **Expected Result:** The eth01 interface is selected and you are presented with eth01 Interface Statistics. You have selected 'Edit' and are presented with properties to change.

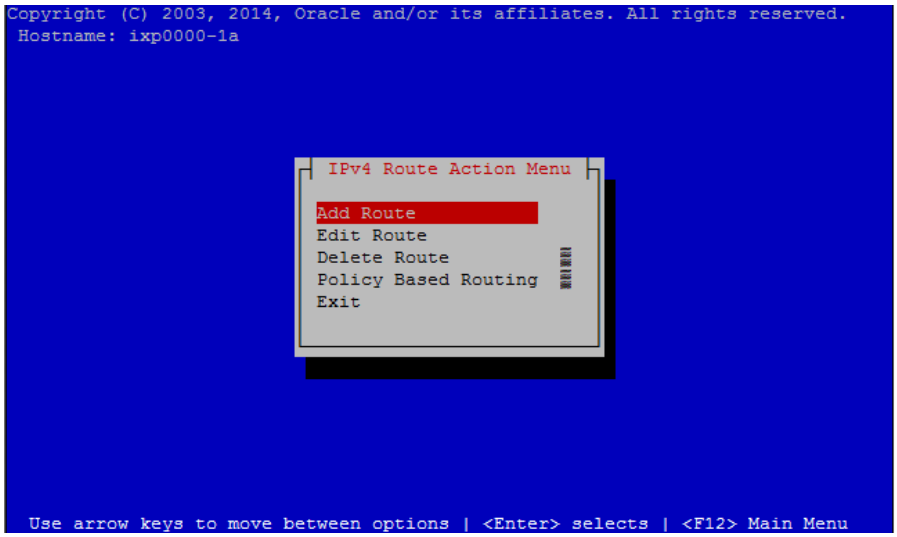
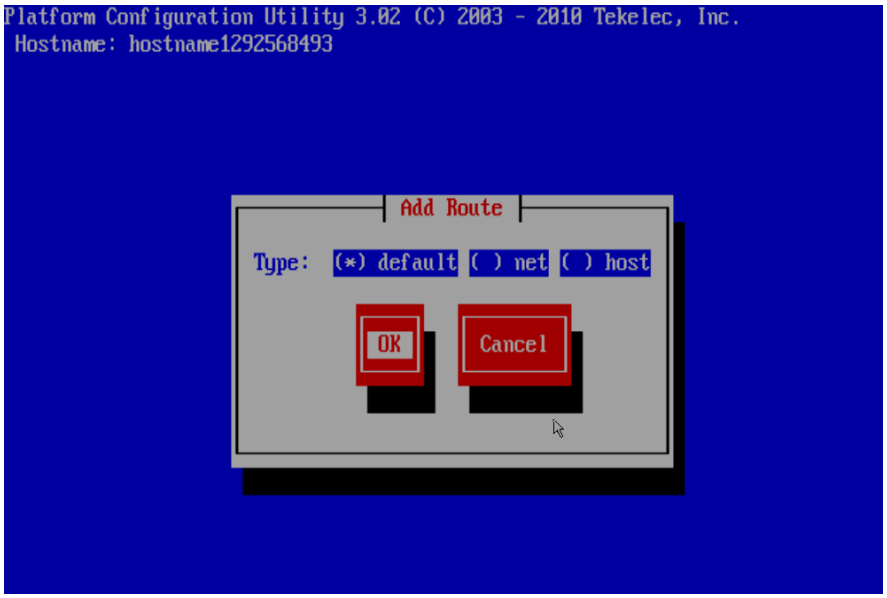
8	Configure MTU, GRO, and boot protocol	Press **[TAB]** to move to off for GRO, then press the **[SPACEBAR]** key to select it. An asterisk will appear once selected. Press **[TAB]** to move to OK, then press the **[ENTER]** key to continue.  **Expected Result:** GRO is set to off and you now see the menu which allows you to edit the IP address.
9	Configure IP	Press **[TAB]** to move to Yes, then press the **[ENTER]** key to continue. 

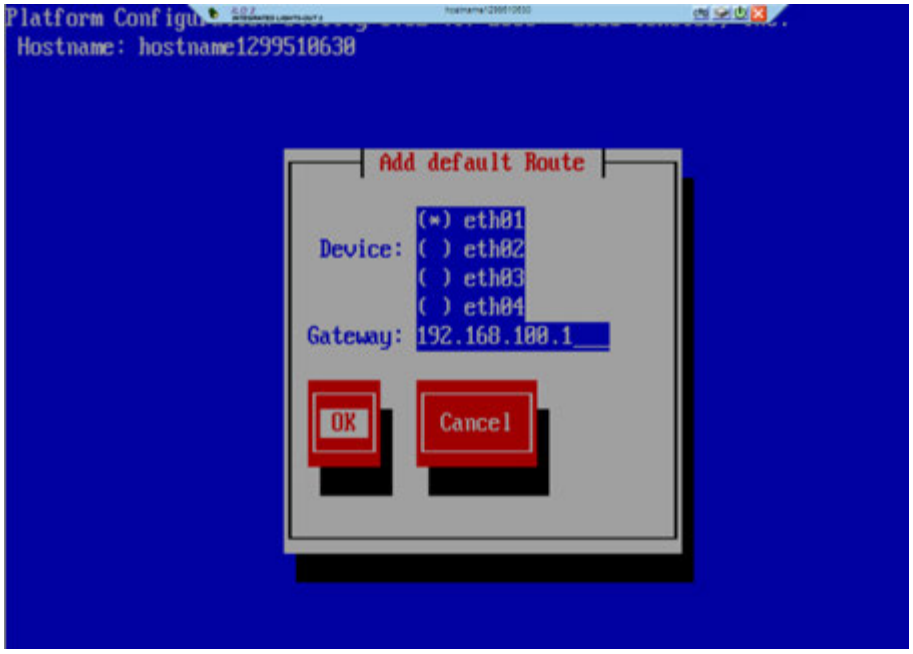
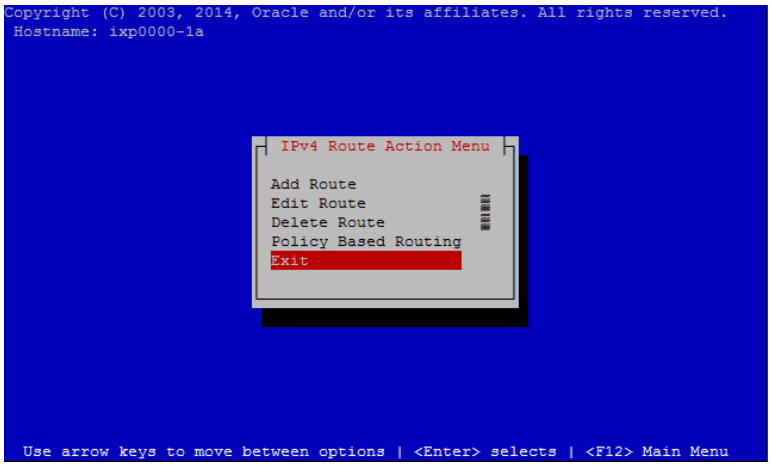
10	Select IPv4	press **[ENTER]** to continue. 
11	Select Add address	press **[ENTER]** to continue. 

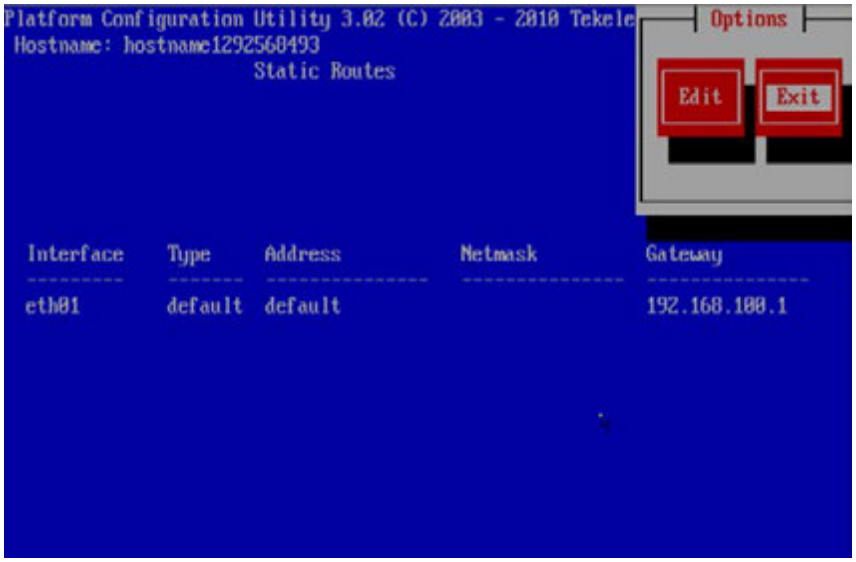
12	Set the IP address and Netmask identified for the eth01 interface	Use the **[TAB]** and arrow keys on the keyboard to add IP address. Enter the IP address of the server then press **[TAB]** to select NETMASK. Press **[TAB]** to select **( ) yes** and press **[SPACEBAR]** to select then **[TAB]** and press **[ENTER]** to continue. 
13		You will see the following screen:  **Expected Result:** IP address and Netmask is set to the correct IP address for the server. Wait for it to complete.

14	Verify the settings and exit	Once the screen comes back, **verify the IP address and Netmask**. Use the **[TAB]** key on the keyboard to select Exit and press **[ENTER]** to continue.  Use the **[TAB]** key on the keyboard to select Exit and press **[ENTER]** to continue  **Expected Result:** IP address and Netmask is set to the correct IP address for the server and you exit the Network Interfaces menu.

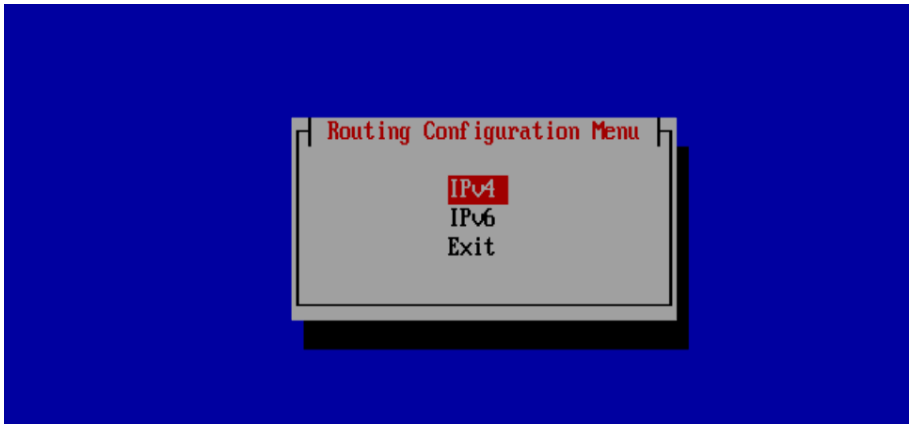
15	Set the Gateway address for the eth01 interface	Use the arrow keys on the keyboard to select Routing and press **[ENTER]** to continue.  Select IPv4 and press **[ENTER]** to continue.  Select Edit and press **[ENTER]** to add the default gateway.  **Expected Result:** Routing menu is opened and Edit is selected

16	Set the IP address and Netmask for the eth01 interface	Select Add Route using the arrow keys.  Use the **[TAB]** and **[SPACEBAR]** keys on the keyboard to select ( ) **default**, then **[TAB]** to **OK** and press **[ENTER]** to continue.  **Expected Result:** Default is selected and you are taken to the next menu which allows you to add the IP address of the default route.

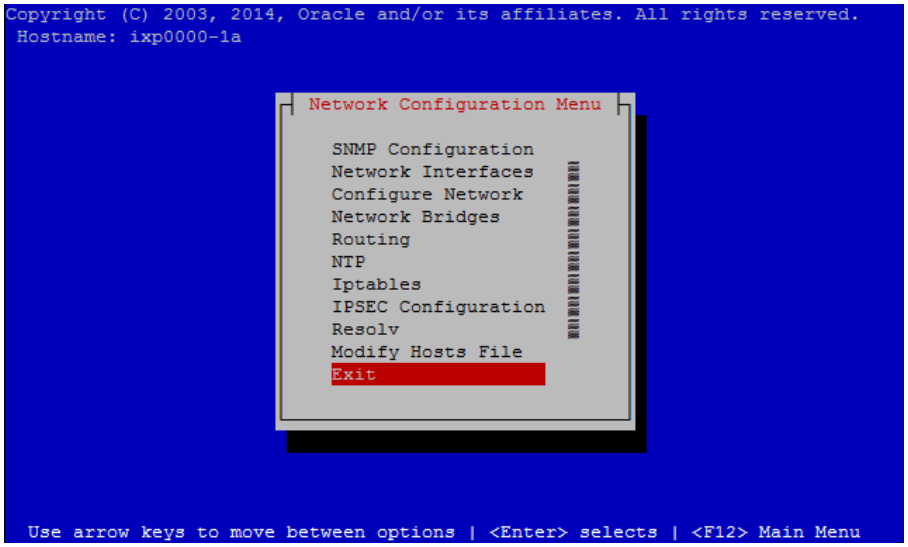
17	Set the default Route Gateway IP address for the eth01 interface	Use the **[TAB]** and **[SPACEBAR]** keys on the keyboard to select **( ) eth01** and then **[TAB]** twice and enter the correct customer's gateway IP address if available. If not available and you are using default test IP addresses instead, enter **192.168.100.1**. Press **[TAB]** to select **OK** then press **[ENTER]** to continue.  Use the arrow keys on the keyboard to select **Exit** then press **[ENTER]** to exit.  **Expected Result:** The correct Gateway IP address is entered. The Route Action menu is exited.
18	Verify the default Route for eth01 and exit the menu	Verify the **eth01** interface is listed and Type and Address are set to default. Gateway should match the IP address you entered in the previous step. Use the **[TAB]** key on the keyboard to select **Exit** and press **[ENTER]** to continue.



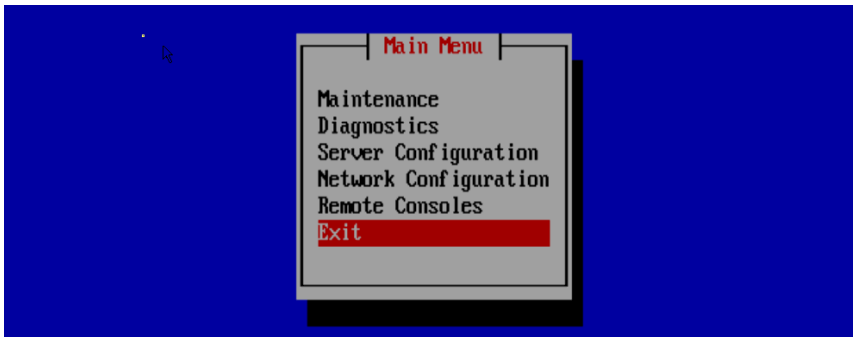
Select **Exit** and press **[ENTER]** to leave the **Routing Configuration** menu



Select **Exit** and press **[ENTER]** to leave the **Network Configuration** menu



Select **Exit** once again to leave the **Platform Configuration Utility**

		 **Expected Result:** The default route (Gateway) IP address is verified and the menu is exited.
19	Configure remaining servers in frame	Repeat Steps 1 through 18 for each equipped HP DL360 server.

13 APPENDIX: OCPIC BULKCONFIG FILE DESCRIPTION

13.1 Management Server Bulkconfig File Description

MGMT is installed on Standard Server from this OCPIC Release and no bulkconfig file is required.

13.2 DRS Bulkconfig File Description

From this OCPIC Release, no bulkconfig file is required for a new DRS installation.

13.3 Mediation Server Bulkconfig File Description

The MEDIATION subsystem bulkconfig file contains the overall MEDIATION pre-installation configuration information.
Note: there is one bulkconfig file for each MEDIATION subsystem.
During the installation process, various scripts use this file to configure MEDIATION.
The bulkconfig file is a case sensitive text file and as such can be created or updated with any available text editor, e.g. vi or vim.

The MEDIATION bulkconfig file template is located on the MEDIATION iso on the /upgrade/IXP_bulkconfig_template path. The file is unique for the MEDIATION subsystem and is present on each server in this subsystem.

Note: When you install OCPIC, you are asked to create this bulkconfig file and update this file. **DO NOT** remove the MEDIATION bulkconfig file from the server.

The MEDIATION subsystem bulkconfig file is used during these processes:
• Manufacturing installation
• Customer network integration
• Change IP
• Disaster recovery procedure

This topic provides a description of each keyword and parameter used in the bulkconfig file. It is important to read and understand the contents of this file.

bulkconfig file location and rights

File name: bulkconfig
File absolute path: /root/bulkconfig

Mount the Mediation iso file. As root run :

```
# mount –o loop /var/TKLC/upgrade/iso_file.iso /mnt/upgrade
```

Copy the good bulkconfig file template:

```
# cp /mnt/upgrade/upgrade/IXP_bulkconfig_template /root/bulkconfig
```

Change the permission on the bulkconfig

```
# chmod 644 /root/bulkconfig
```

Unmount the MEDIATION iso file. As root run :

```
# umount /mnt/upgrade
```

bulkconfig file: template

The bulkconfig file is written in the CSV format.

Each line begins with a keyword that describes the type of information that the line contains. The keyword is mandatory. Each line must begin with the keyword, and then contains various values for
this keyword. The keyword and its associated values are separated by a comma. There are no empty spaces in the lines.

```
host,hostname_of_1st_server,IP_address,function,interface_name,network_mask,network_gatew
ay
host,hostname_of_2nd_server,IP_address,function,interface_name,network_mask,network_gate
way
host,hostname_of_nth_server,IP_address,function,interface_name,network_mask,network_gatew
ay
ntpserver1,IP_address
ntpserver2,IP_address
ntpserver3,IP_address
ntppeerA,
ntppeerB,
nspprimary,IP_address_of_primary_weblogic_or_onebox_nsp_backend
nspsecondary,IP_address_of_secondary_weblogic
nsporacle,IP_address_of_oracle_server
timezone,time_zone
pdu,IP_address,directory_path
pdu,IP_address,directory_path
```

The highlighted entries are for the PDU share directories on external storage server like ZFS

Refer to the following descriptions of each keyword and its associated values.

host Description

```
host,hostname_of_1st_server,IP_address,function,interface_name,network_mask,network_gatew
ay
host,hostname_of_2nd_server,IP_address,function,interface_name,network_mask,network_gate
way
host,hostname_of_nth_server,IP_address,function,interface_name,network_mask,network_gatew
ay
```

...

Example (installation):

```
host,ixp1981-1a,10.236.2.141,IXP-PDU,eth01,255.255.255.224,10.236.2.129
host,ixp1981-1b,10.236.2.142,IXP-BASE,eth01,255.255.255.224,10.236.2.129
host,ixp1981-1c,10.236.2.143,IXP-BASE,eth01,255.255.255.224,10.236.2.129
```

The count of the host lines equals to the count of the servers in the subsystem. There is a single host line per server in the subsystem.

Example (disaster recovery of ixp1981-1b server):

```
host,ixp1981-1a,10.236.2.141,IXP-PDU,eth01,255.255.255.224,10.236.2.129
host,ixp1981-1b,10.236.2.142,DR-BASE,eth01,255.255.255.224,10.236.2.129
host,ixp1981-1c,10.236.2.143,IXP-BASE,eth01,255.255.255.224,10.236.2.129
```

The count of the host lines equals to the count of the servers in the subsystem. There is a single host line per server in the subsystem.

The host keyword has the following associated values:
hostname_of_nth_server The server hostname in the standard MEDIATION format: ixpNNNN-MA where:
• N is numeric 0-9
• M is numeric 1-9
• A is alphabetical a-z

IP_address The IP address of the server. For blade systems, the backend (VLAN 3) IP address of the server.
function The function of the server. Use one of the following entries for installation:
• IXP-PDU for the PDU Storage Server
• IXP-BASE for the IXP Base Server
Function for the disaster recovery procedure for the particular server is different. Use one of the following entries for disaster recovery:
• DR-PDU for the PDU Storage Server
• DR-BASE for the IXP Base Server
interface_name Name of the interface where the network settings are applied.
• eth01 for the rackmount systems
• bond0.3 for the blade systems
network_mask The network mask.
network_gateway The default gateway.

ntpserver Description

Refer to Appendix ” How to configure NTP”.

```
ntpserver1,IP_address
ntpserver2,IP_address
ntpserver3,IP_address
ntppeerA,
ntppeerB,
```

• ntpserver1 is the first NTP server
• ntpserver2 is the second NTP server
• ntpserver3 is the third NTP server
• ntppeerA not applicable; leave empty
• ntppeerB not applicable; leave empty

Example:

```
ntpserver1,10.236.129.11
ntpserver2,
ntpserver3,
ntppeerA,
ntppeerB,
```

The ntpserver keyword has the following associated value:
IP_address The IP address of the NTP server.

NSP Description

```
nspprimary,IP_address_of _or_onebox_nsp_backend
nsporacle,IP_address_of_oracle_server
```

• nspprimary is the Management One-box Management server
• nsporacle is the Management Oracle server or Management Server One Box

Example (for a One-box Management Server):

```
nspprimary,10.10.10.10
nspsecondary,
nsporacle,
```

The NSP keyword has the following associated values:
IP_address_of_primary_weblogic_or_onebox_nsp_backend The IP address of the MANAGEMENT SERVER server:
• One-box: backend IP address of the One-box Management Server

IP_address_of_secondary_weblogic The IP address of the Management Server:
• One-box: not applicable; leave empty

IP_address_of_oracle_server The IP address of the Management Server Oracle server:
• One-box: not applicable; leave empty

timezone Description

```
timezone,time_zone
```

Example:

```
timezone,Europe/Paris
```

The timezone keyword has the following associated value:

time_zone
The timezone string. For a list of available timezones that you can use, refer to the /usr/share/zoneinfo/zone.tab file TZ column. For example:

```
[root@nsp ~]# cat /usr/share/zoneinfo/zone.tab
--CUT--
#code coordinates TZ comments
AD +4230+00131 Europe/Andorra
909-2122-001 Revision 1.11, February 02, 2012 DRAFT 210
PIC Bulkconfig File Description
AE +2518+05518 Asia/Dubai
AF +3431+06912 Asia/Kabul
AG +1703-06148 America/Antigua
CZ +5005+01426 Europe/Paris
---CUT—
```

bulkconfig file: installation example

A bulkconfig file needs to be created for the following MEDIATION subsystem:

• Subsystem hostname: ixp1981
• 1a server is the PDU Storage Server with the IP address: 10.236.2.141
• 1b server is the Base Server with the IP address: 10.236.2.142
• 1c server is the Base Server with the IP address: 10.236.2.143
• Network interface: eth01
• Network mask: 255.255.255.254
• Default gateway: 10.236.2.129
• NTP server IP address: 10.236.129.11
• NSP One-box IP address: 10.10.10.10
• Server timezone: Europe/Paris

The corresponding bulkconfig file you create should appear as follows:

Note: There is no new line character in the middle of the host configuration.

```
[root@ixp1981-1a ~]# cat /root/bulkconfig
host,ixp1981-1a,10.236.2.141,IXP-PDU,eth01,255.255.255.224,10.236.2.129
host,ixp1981-1b,10.236.2.142,IXP-BASE,eth01,255.255.255.224,10.236.2.129
host,ixp1981-1c,10.236.2.143,IXP-BASE,eth01,255.255.255.224,10.236.2.129
ntpserver1,10.236.129.11
ntpserver2,
ntpserver3,
ntppeerA,
ntppeerB,
nspprimary,10.10.10.10
nspsecondary,
nsporacle,
timezone,Europe/Paris
```

Automated records in /etc/bulkconfig file

During the automated integration of MEDIATION subsystem with EFS server(s) the following line is added to
the /etc/bulkconfig file (one per integrated EFS server):

```
efs,hostname_of_EFS,IP_address_of_EFS
```

where
• hostname_of_EFS is the hostname of EFS that local DataFeeds hosts uses as an export target
• IP_address_of_EFS is the IP address of such EFS

Example:

```
efs,ixp7777-1e,10.236.0.33
```

External PDU storage server Description

After mediation server installation and before customer integration the following lines should be added in bulkconfig to add the mounts on external storage server for PDU storage.

```
pdu,IP_address,directory_path
pdu,IP_address,directory_path
```

- *pdu* is the keyword to identify the external pdu storage server entry.
- IP_address is the ip address of the external PDU storage server.
- directory_path is the path of directory on external PDU storage server to be mounted on mediation server to store the PDUs

Example for ZFS storage server :

```
pdu,10.31.2.72,/export/pdu_1
pdu,10.31.2.72,/export/pdu_2
pdu,10.31.2.75,/export/pdu_1
pdu,10.31.2.75,/export/pdu_3
```

13.4 Acquisition Server Bulkconfig File Description

This topic describes the syntax and use of the acquisition server bulkconfig file.

The acquisition server bulk configuration file contains the overall configuration information. The **bulkConf.pl** script uses this single file to configure the IMF subsystem or PMF accordingly.

The bulkconfig file is a text file and as such can be created or updated with any available text editor, e.g. vi or vim.

The file is unique per subsystem and is present on each server in the subsystem.

DO NOT remove the acquisition server bulkconfig file from the server or subsystem.

This topic provides a description of each keyword and parameter used in the bulkconfig file (bulkconfig). It is important to read and understand the contents of this file.

Bulkconfig file location and rights

File name: `bulkconfig`
File path:`/root/bulkconfig`

Mount the Acquisition Server iso file. As root run :

```
# mount –o loop /var/TKLC/upgrade/iso_file.iso /mnt/upgrade
```

Copy the good bulkconfig file template:

```
# cp /mnt/upgrade/upgrade/XMF_bulkconfig_template /root/bulkconfig
```

Change the permission on the bulkconfig

```
# chmod 644 /root/bulkconfig
```

Unmount the Acquisition Server iso file. As root run :

```
# umount /mnt/upgrade
```

Bulkconfig file: template

The bulkconfig file is written in the CSV format.

Each line begins with a keyword that describes the type of information that the line contains. The keyword is mandatory. Each line must begin with the keyword and then contains various values for this keyword. The keyword and its associated values are separated by a comma. There are no empty spaces in the lines.

```
host,hostname_of_1st_server,IP_address,function,interface_name,network_mask,network_gateway,designation
```

```
host,hostname_of_2nd_server,IP_address,function,interface_name,network_mask,network_gateway,designation
host,hostname_of_nth_server,IP_address,function,interface_name,network_mask,network_gateway,designation
ntpserver1,IP_address
ntpserver2,IP_address
ntpserver3,IP_address
ntppeerA,IP_address
ntppeerB,IP_address
nspprimary,IP_address_of_primary_nsp
nspsecondary,IP_address_of_secondary_nsp
nsporacle,IP_Address_of_NSP1Box_OR_Oracle_DB
timezone,time_zone
```

Refer to the following descriptions of each keyword and its associated values.

Host Description

host,hostname_of_1st_server,IP_address,function,interface_name,network_mask,network_gateway,designation
host,hostname_of_2nd_server,IP_address,function,interface_name,network_mask,network_gateway,designation
host,hostname_of_nth_server,IP_address,function,interface_name,network_mask,network_gateway,designation…

Example for IMF setup:

```
host,imf-1a,192.168.253.5,IMF,bond0.200,255.255.255.224,192.168.253.1,1A
host,imf-1b,192.168.253.6,IMF,bond0.200,255.255.255.224,192.168.253.1,1B
host,imf-1c,192.168.253.7,IMF,bond0.200,255.255.255.224,192.168.253.1,1C
```

Example for PMF standalone:

```
host,pmf-0a,192.168.2.106,PMF,eth01,255.255.255.0,192.168.2.1,0A
```

The count of the host lines equals to the count of the servers in the subsystem. There is a single host line per server in the subsystem.

The host keyword has the following associated values:

hostname_of_nth_server	The server hostname. Note: It is recommended that the hostname ends with the designation of the server (for example, malibu-1a).
function	The function of the server. Use one of the following entries: •he function
designation	The designation of the server is a combination of frame number and position of the server in the frame. Use the following rule: • IMF subsystem: 1A for the first server, 1B for the second server, etc. •F subsystem: 1A for
interface name	The name of customer network interface (typically: bond0.200 for IMF and eth01 for PMF)
IP_address	The IP address of the server. For blade systems, the internal IP address of the server
network_mask	The network mask
network_gateway	The default gateway

ntpserver Description

Refer to Appendix 17 to know how to configure NTP.

```
ntpserver1,IP_address
ntpserver2,IP_address
ntpserver3,IP_addres
ntppeerA,IP_address
ntppeerB,IP_address
```

- `ntpserver1` is the first NTP server
- `ntpserver2` is the second NTP server
- `ntpserver3` is the third NTP server
- `ntppeerA` not applicable; leave empty
- `ntppeerB` not applicable; leave empty

Example:

```
ntpserver1,10.236.129.11
```

The ntpserver keyword has the following associated value:

IP_address	The IP address of the NTP server.

nsp Description

```
nspprimary,IP_address_of_primary_nsp
nspsecondary,IP_address_of_secondary_nsp_appserver
nsporacle,IP_address_of_oracleDB_or_1Box
```

- `nspprimary` is the management Primary server
- `nspsecondary` is the management Secondary WebLogic server
- nsporacle is the oracle database server. In case of 1box it will be same as nspprimary

Example (for a One-box Management Server):

```
nspprimary,10.10.10.10
```

The nsp keyword has the following associated values:

IP_address_of_primary_nsp	The IP address of the Management Server Primary server: • One-box: backend IP address of the One-box Management Server
IP_address_of_secondary_nsp	The IP address of the Management Server Secondary server: • One-box: not applicable; leave empty

timezone Description

```
timezone,time_zone
```

Example:

```
timezone,Europe/Paris
```

The timezone keyword has the following associated value:

time_zone	The timezone string. For a list of available timezones that you can use, refer to the `/usr/share/zoneinfo/zone.tab` file **TZ** column. For example:

```
[root@nsp ~]# cat /usr/share/zoneinfo/zone.tab
--CUT--
#code      coordinates      TZ                 comments
AD         +4230+00131      Europe/Andorra
AE         +2518+05518      Asia/Dubai
AF         +3431+06912      Asia/Kabul
AG         +1703-06148      America/Antigua
CZ         +5005+01426      Europe/Prague
----CUT—
```

Bulkconfig file: example

A bulkconfig file needs to be created for the following acquisition server subsystem:

- Subsystem hostname: `imf-1a`
- 1a server with the IP address: `192.168.253.5`
- 1b server with the IP address: `192.168.253.6`
- 1c server with the IP address: `191.168.253.7`
- IMF subsystem, interface: `bond0.200`
- Network mask: `255.255.255.224`
- Default gateway: `192.168.253.1`
- NTP server IP address: `10.250.32.10`
- Subsystem is added to the appserver with IP address: `10.10.10.10`
- Subsystem timezone: `Europe/Paris`

The corresponding bulkconfig file you create should appear as follows:

Note: There is no new line character in the middle of the host configuration.

```
[root@T3-1A upgrade]# cat /root/bulkconfig
host,imf-1a,192.168.253.5,IMF,bond0.200,255.255.255.224,192.168.253.1,1A
host,imf-1b,192.168.253.6,IMF,bond0.200,255.255.255.224,192.168.253.1,1B
host,imf-1c,192.168.253.7,IMF,bond0.200, 255.255.255.224,192.168.253.1,1C
ntpserver1,10.250.32.10
ntpserver2,10.250.32.11
ntpserver3,10.250.32.12
ntppeerA,10.250.32.13
ntppeerB,10.250.32.14
nspprimary,10.10.10.10
nspsecondary,10.10.10.11
nsporacle,10.31.2.60
timezone,Europe/Paris
```

14 APPENDIX: CAPACITY MANAGEMENT KPI CONFIGURATIONS

Capacity Management configurations are all to be downloaded from My Oracle Support, please refer to note **Capacity Management Good Practices [1683859.2]**.

Access to My Oracle Support (MOS) is decribed in **Quick Start Guide, Apendix A**.

15 APPENDIX: HOW TO CONFIGURE NTP

Refer https://support.oracle.com/epmos/faces/DocumentDisplay?id=2083591.1 to configure NTP.

16 APPENDIX: INSTALL JRE 1.8

JRE has to be installed separately, post application installation, on Acquisition and Mediation servers.

The minimal supported JRE release is “1.8.0”. The following instruction must be executed on all the mediation and acquisition servers before integration with management server.

1. Follow the MOS KM 1412103.2 to download the latest version of the JRE 1.8.0:
   - In the section “Downloads (Latest JDK/JRE)”, click on JDK/JRE 8
   - On the next page, be sure to choose the platform “Linux x86-64”, then start the downloading
   - The downloaded file is an archive containing several other files: extract the file called jre-8u*XXX*-linux-x64.rpm, where *XXX* is the build number

   For example, by November 2016, the following files are available:

   - p18143322_1800_linux-x86-64.zip is the downloaded archive
   - jre-8u**112**-linux-x64.rpm is the package to install (one of the files of the archive)

2. Copy the package file on the server at /var/TKLC/upgrade

3. Install the JRE package, as root:

```
# cd /var/TKLC/upgrade
# rpm -Uvh <jre_rpm>
```

   Provide the name of the package file to install.

4. Keep the JRE package safe from a possible incremental upgrade of the server, as root:

```
# su - platcfg
```

   a. Browse to **Maintenance → Upgrade → Non Tekelec RPM Management**
   b. Do **Add Non Tekelec RPMs to TPD control** for the JRE package. Ignore all other packages.
   c. Check that the package is under TPD control, by selecting **List Non Tekelec RPMs under TPD control**.
   d. Leave the platcfg menu.

5. Restart the java processes, as cfguser:

   On **Acquisition Servers**:

```
# pm.set off jmxAgent; pm.set on jmxAgent
```

   On **Mediation Servers**:

```
# pm.set off JmxAgent; pm.set on JmxAgent
# pm.set off dsapi; pm.set on dsapi
# pm.set off DataExport; pm.set on DataExport
```

17 APPENDIX: MY ORACLE SUPPORT (MOS)

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

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

1. Select 2 for New Service Request

2. Select 3 for Hardware, Networking and Solaris Operating System Support

3. Select 2 for Non-technical issue

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

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

18 APPENDIX: LOCATE PRODUCT DOCUMENTATION ON THE ORACLE TECHNOLOGY NETWORK SITE

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

1. Access the **Oracle Help Center** site at http://docs.oracle.com.
2. Click **Industries** icon.
3. Under the **Oracle Communications** heading, click the **Oracle Communications documentation** link.The Communications Documentation page appears. Go to the **Network Visibility and Resource Management** section.
4. Click on **Performance Intelligence Center** and then the release number. A list of the entire documentation set for the selected release appears.
5. To download a file to your location, right-click the **PDF** link and select Save Target As (or similar command based on your browser), and save to a local folder.

Note: As long as the documentation site has not been significantly refactored, you can use this link as a shortcut to step 4: http://docs.oracle.com/en/industries/communications/performance-intelligence-center/index.html