HP Customer Experience Assurance V4.5

Installation Guide

Edition: V1.2
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HP Customer Experience Assurance V4.5 is an OEM of the FlowSight application Release 4.5 from Zhilabs S.L. This document contains references to FlowSight which is identical to HP Customer Experience Assurance.

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1 Introduction

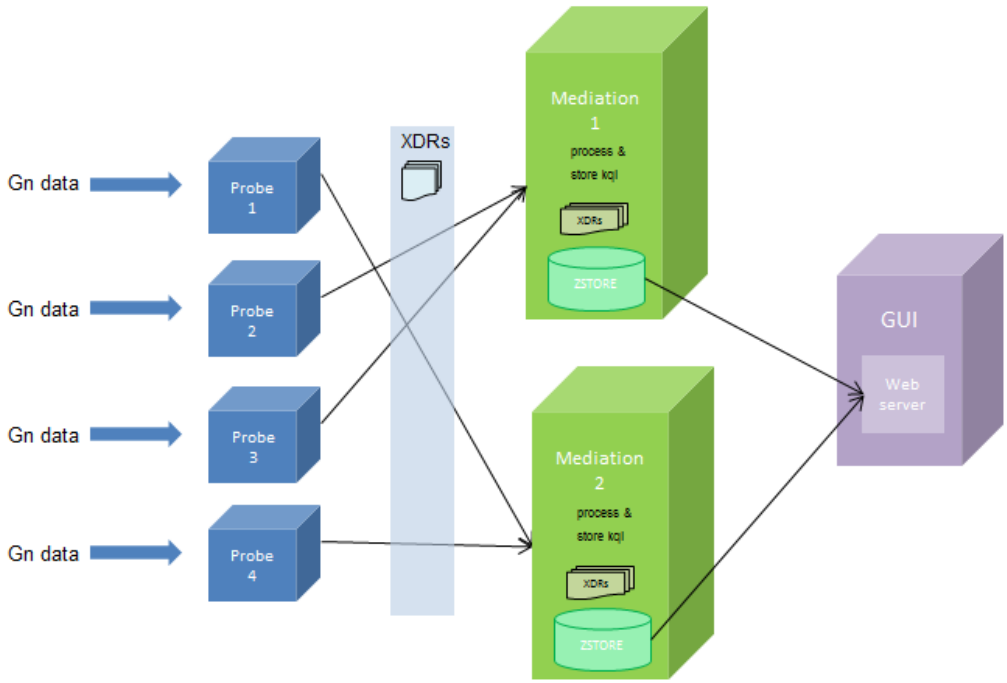
This document provides a detailed set of instructions on how to install and configure the environment needed for using HP *CEA* QoE Solution.

Chapters in this document are:

- Architecture
- Software HP CEA requirements
- Installing HP CEA software
- Reference-files
- Appendixes

2 Architecture

The following figure shows a generic scenario for the integration of HP CEA solution.



In the figure below, it can be seen 3 main elements:

- Probe Server: sniff data from capture interface (Gn traffic), process it and generate XDR files to be used in mediation servers
- Mediation Server: collect XDR files, parse and correlate them with defined rules and generate the reports to be stored in zstore database.
- Gui Server: all the information stored in the database will be displayed by the user through the graphic interface deployed at the web server.
- Master Server: Master-server is a service that allows performing distributed queries among different mediation hosts. This service is needed in case of having more than one mediation server processing information of the same families.

Please note that this document describes the generic scenario containing all the HP *CEA* elements.

3 Software HP CEA requirements

This chapter presents the software requirements needed to install and use HP CEA successfully.

It should be configured the `SLES 11 SP1 x86_64*.iso` *or* `SLES 11 SP2 x86_64*.iso` (depending on the kind of server: mediation and GUI or probe) at Y*ast* repository.

3.1 Operating System

HP CEA is designed to work in a 64 bits Linux environment. It is mandatory to use SUSE Linux Enterprise Server (also known as SLES).

In order to detect current version of SO installed following command can be executed:

```
zhilabs@mediation4:~>   lsb_release -a
LSB Version:    core-2.0-noarch:core-3.2-noarch:core-4.0-noarch:core-2.0-x86_64:core-3.2-x86_64
:core-4.0-x86_64:desktop-4.0-amd64:desktop-4.0-noarch:graphics-2.0-amd64:graphics-2.0-noarch:gr
aphics-3.2-amd64:graphics-3.2-noarch:graphics-4.0-amd64:graphics-4.0-noarch
Distributor ID: SUSE LINUX
Description:    SUSE Linux Enterprise Server 11 (x86_64)
Release:        11
Codename:       n/a
```

- SO version is in Description field.
- Service Pack version of the SO is specified in the Release field (marked in red).

To install mediation servers and GUI servers it is used SLES 11 SP1 x86_64, which will be used for reference throughout this manual. In probe servers installations, it must be used SLES11 SP2.

Machine	S.O Software Release	Service Pack
Probe	SUSE Linux Enterprise Server SLES 11 x86_64	SP2
Mediation	SUSE Linux Enterprise Server SLES 11 x86_64	SP1
GUI	SUSE Linux Enterprise Server SLES 11 x86_64	SP1
Output server	SUSE Linux Enterprise Server SLES 11 x86_64	SP2

Just after installing the O.S. there is a basic machine configuration, like the one shown in the picture below:

```
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1              97G  1.9G   90G   2% /
devtmpfs              3.9G   64K  3.9G   1% /dev
tmpfs                 3.9G     0  3.9G   0% /dev/shm
/dev/sr0              4.3G  4.3G     0 100% /mnt/cdrom
```

3.1.1 Tunning

It is necessary to review and modify server parameters in order to get the best performance of the servers. These are the actions to tune the server:

3.1.1.1 BIOS Tunning

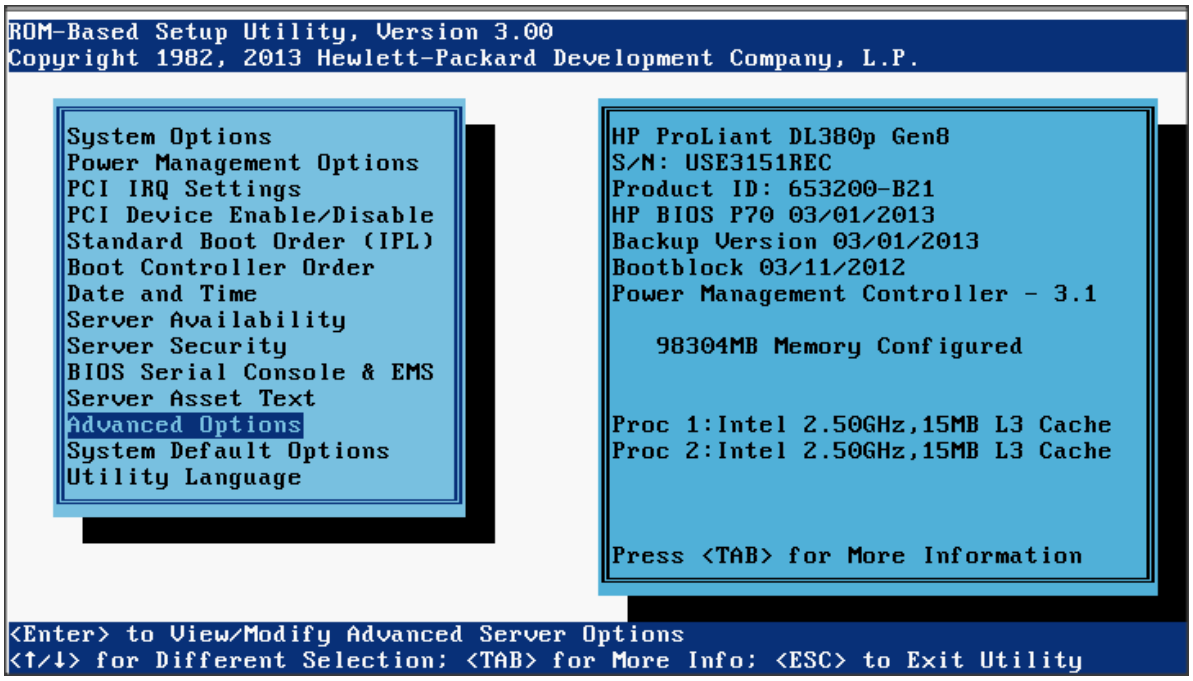
To access the BIOS it is necessary to reboot the server from the ILO, and when it is restarting it appears in the screen to press F9 to enter setup. All this settings apply to Gen8 servers. The parameters must be confirmed for G7 servers.

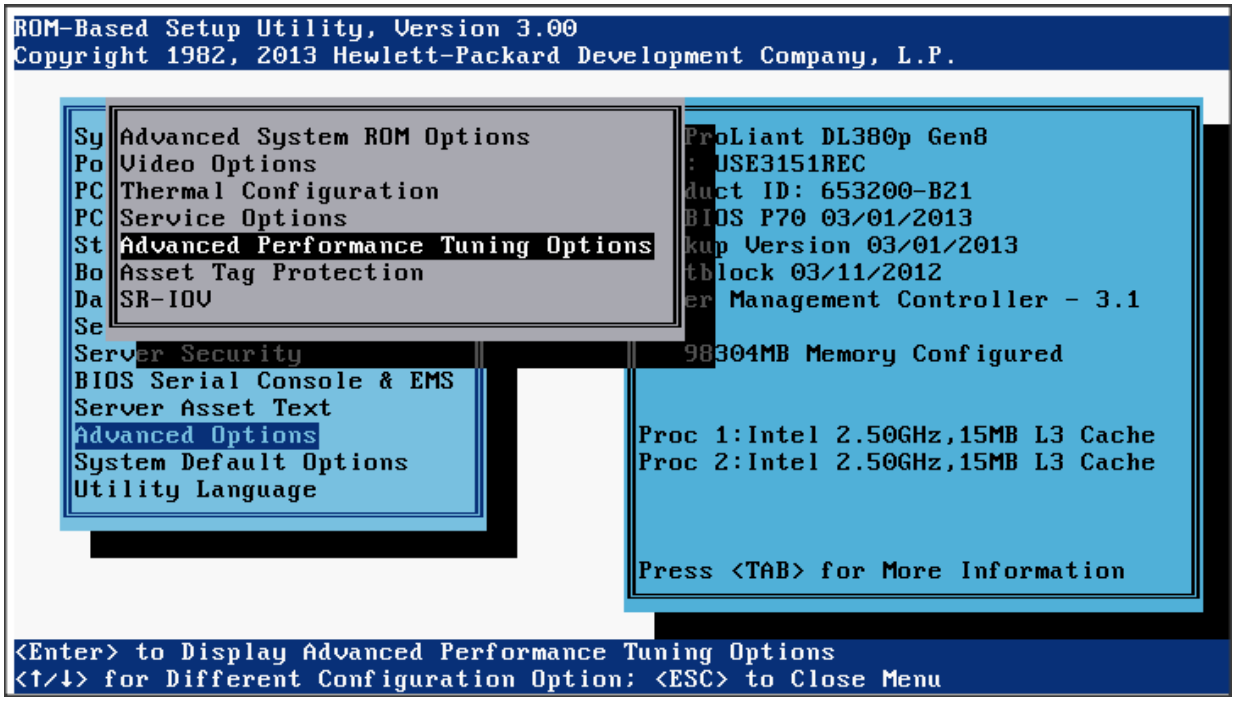
After pressing the F9 Button it changes the color:

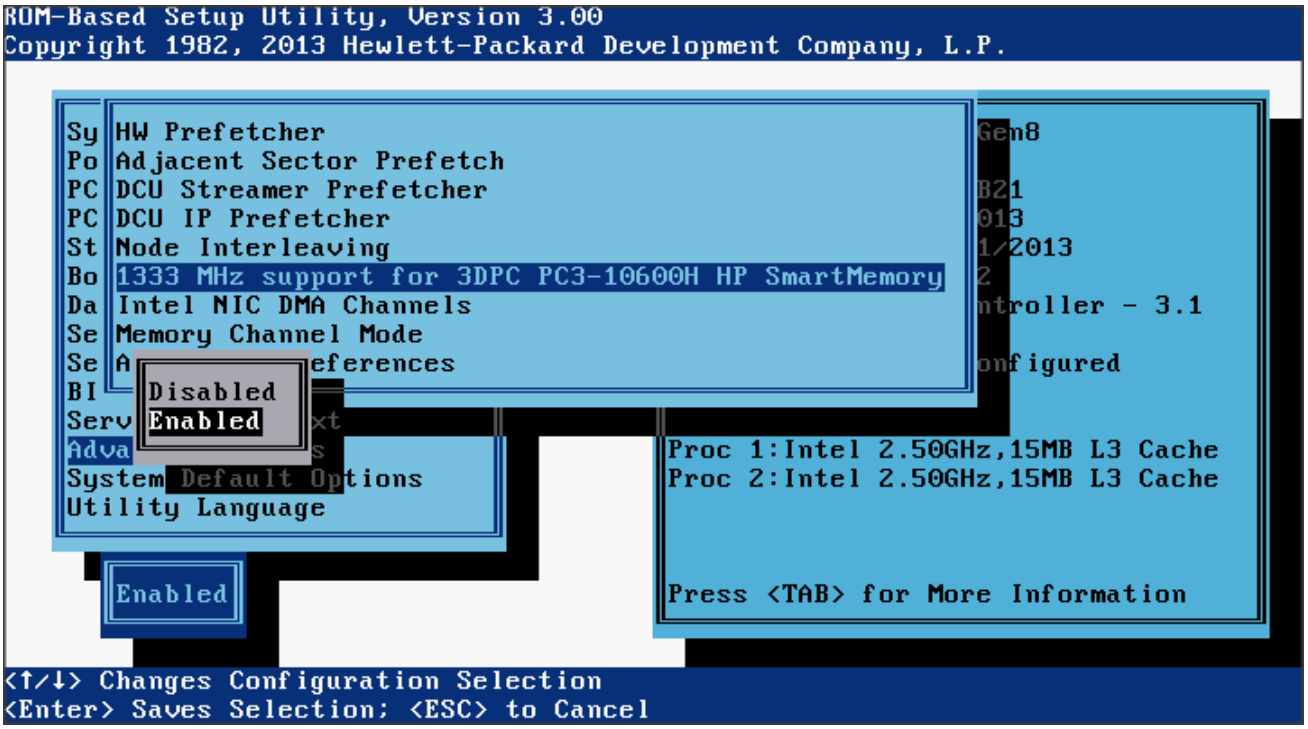
BIOS screen can take several minutes to be accessible.

These are the settings to modify. Follow the steps described in the pictures:

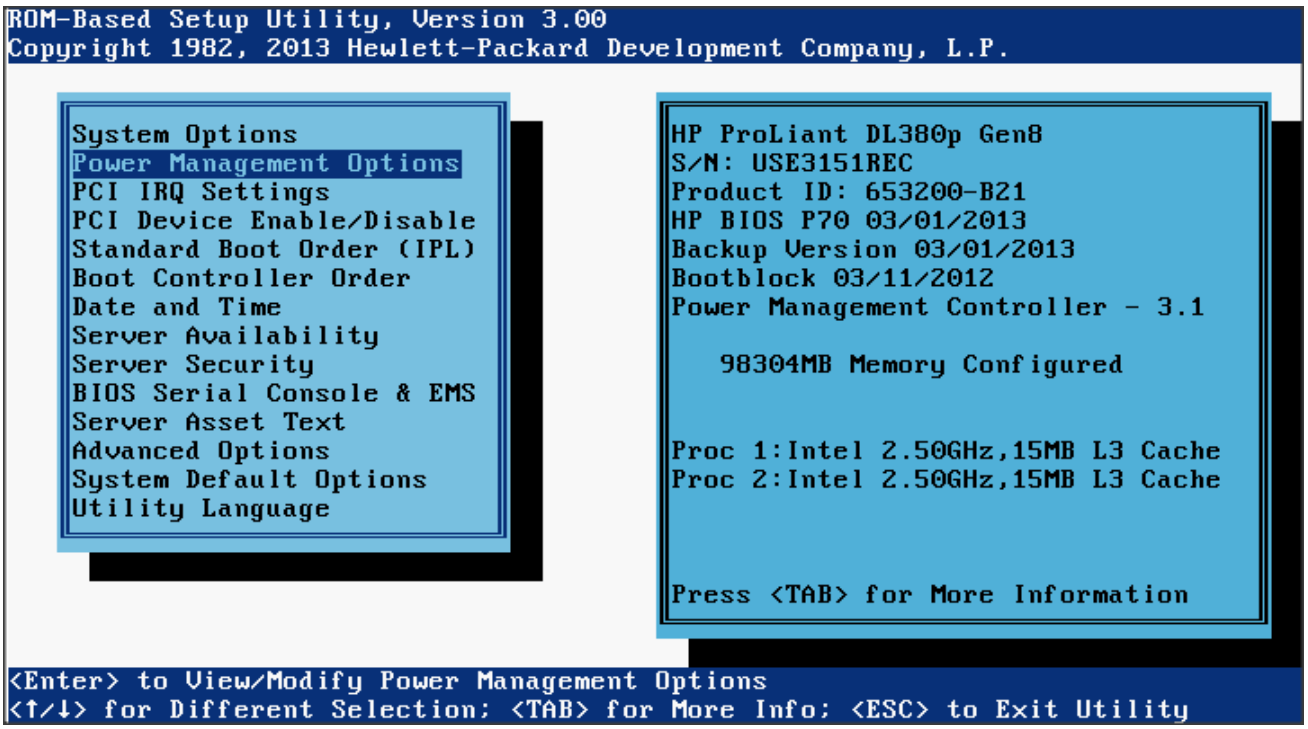
1. 1333 MHz support for 3DPC PC3-10600H HP SmartMemory → Enabled

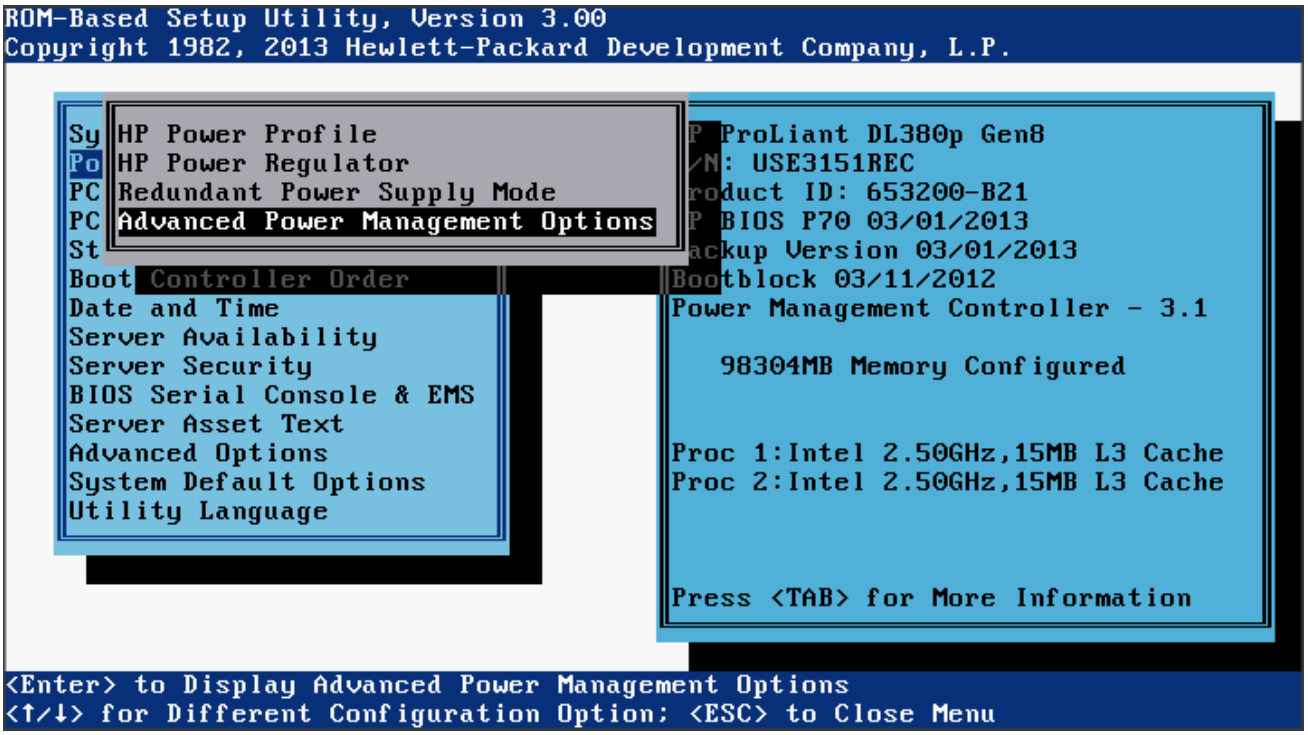


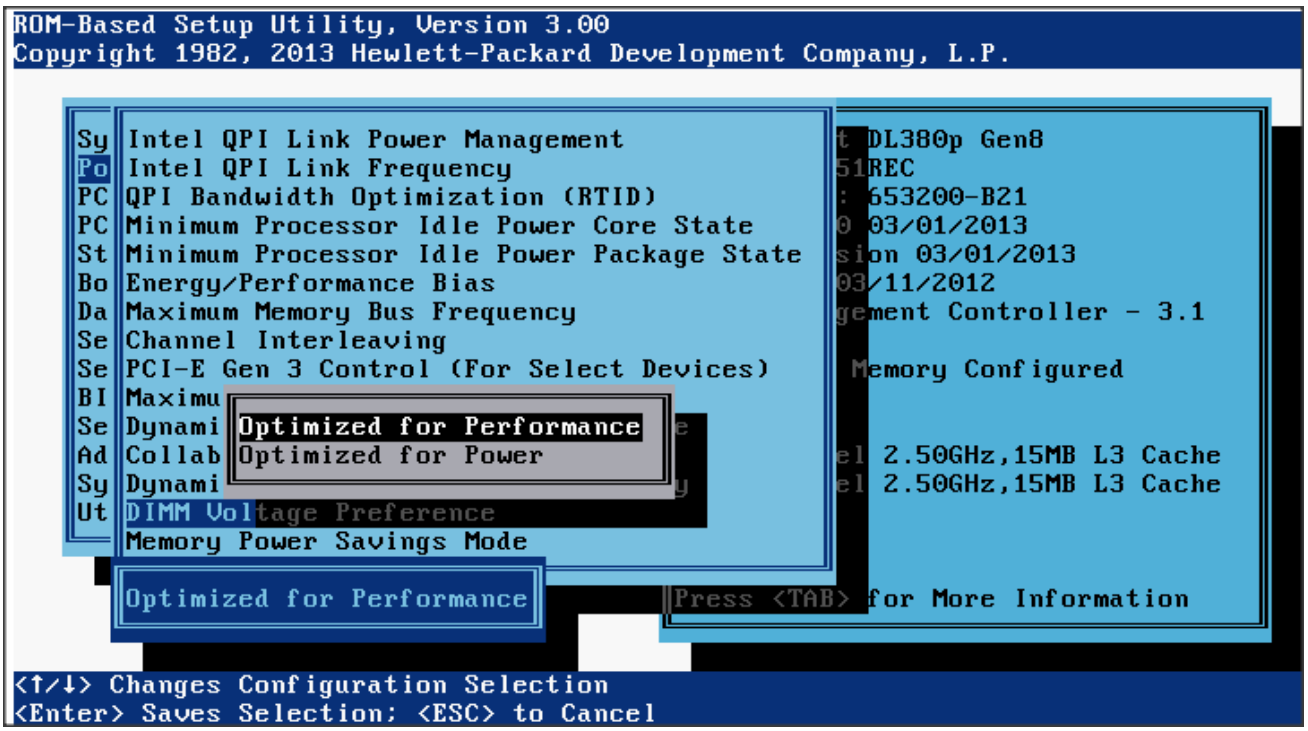




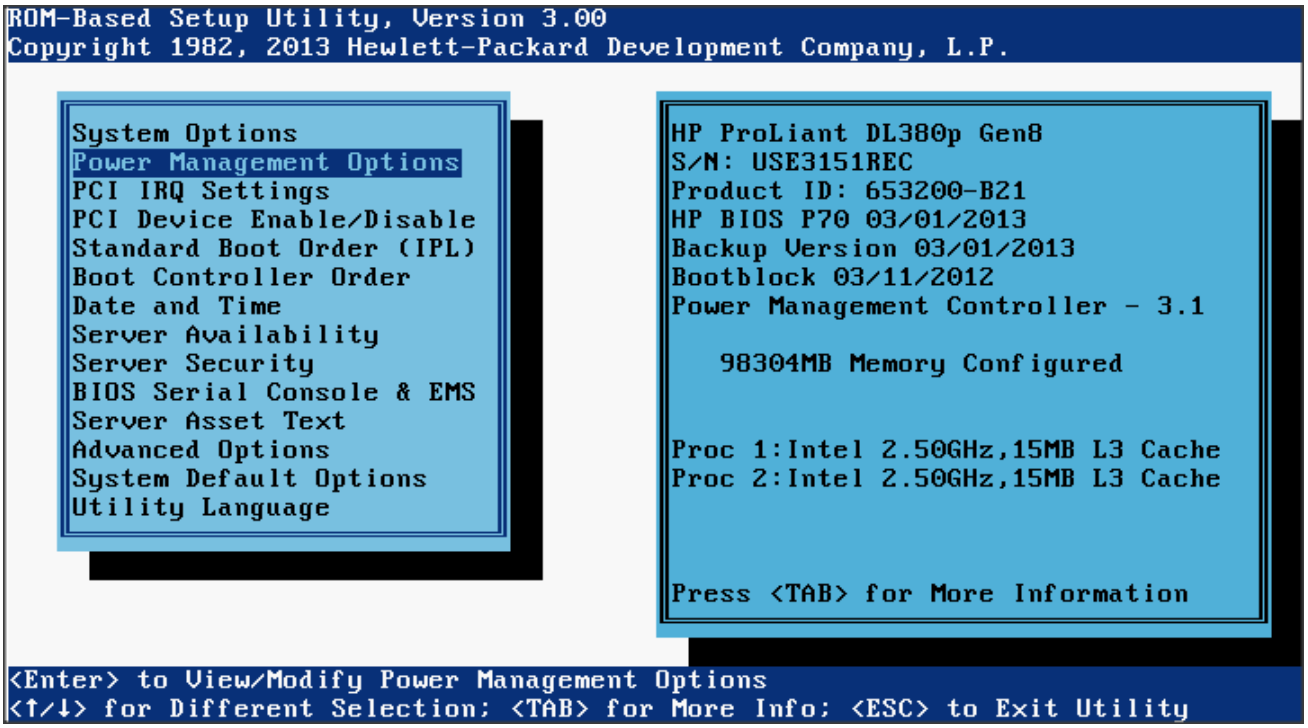
2. DiMM Voltage Preference → Optimized for Performance

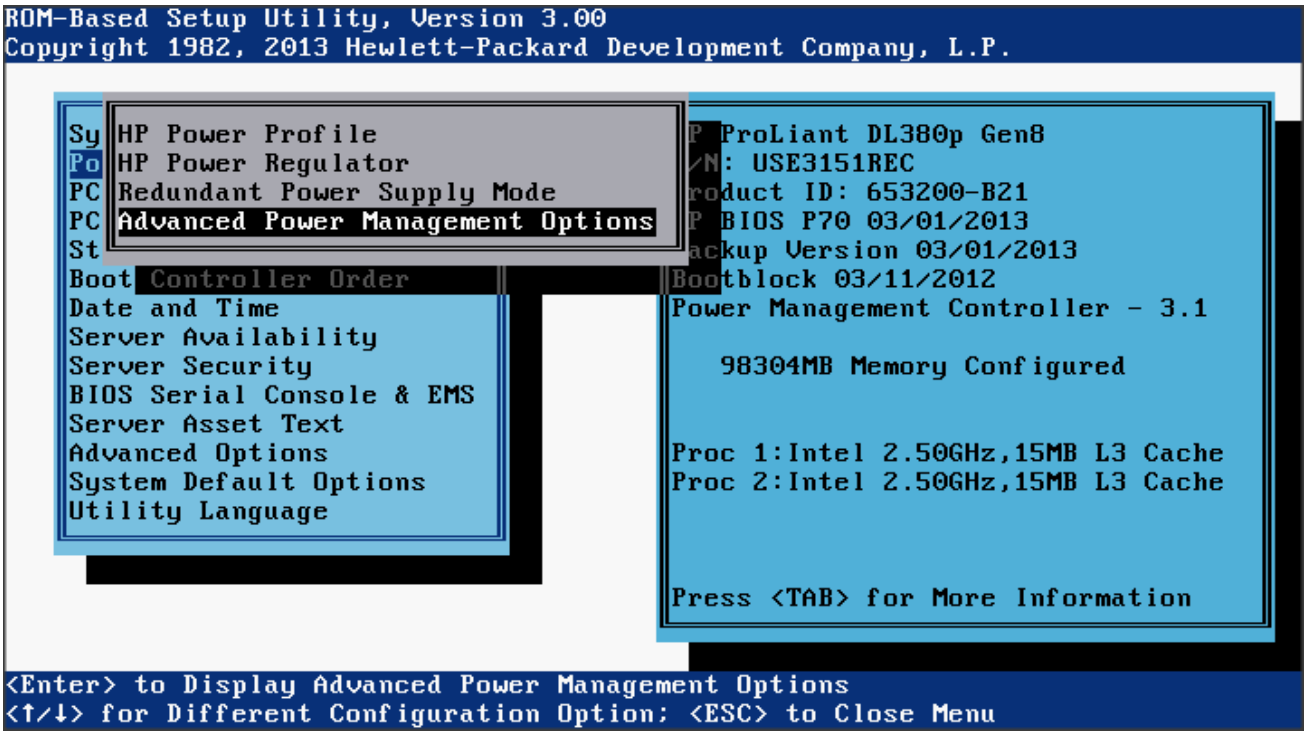


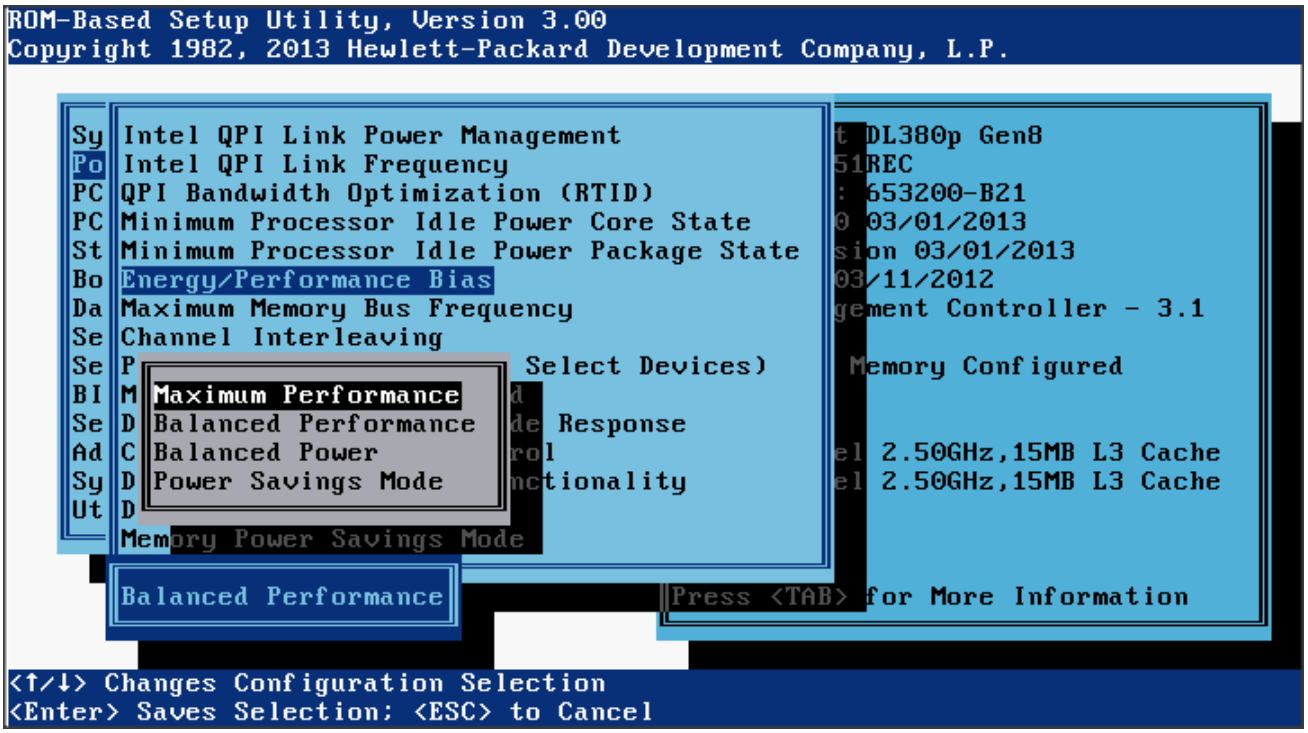




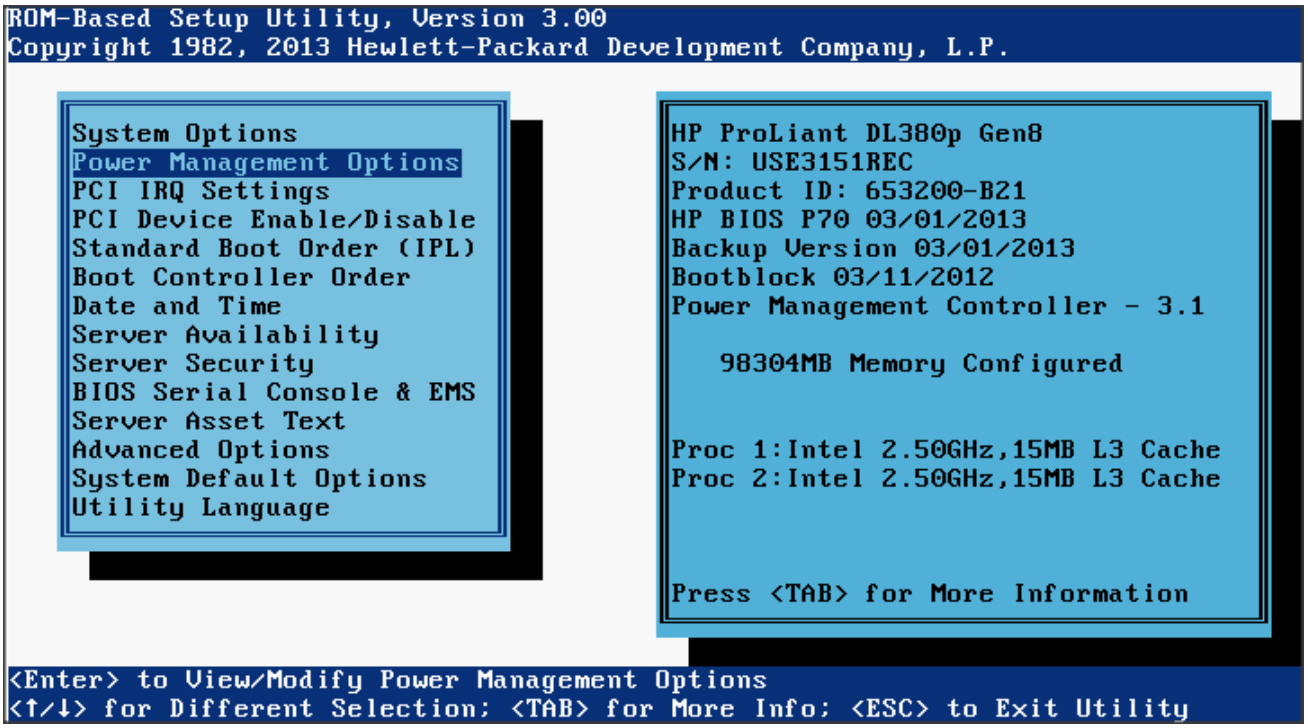
3. Energy/Performance Bias → Maximum Performance

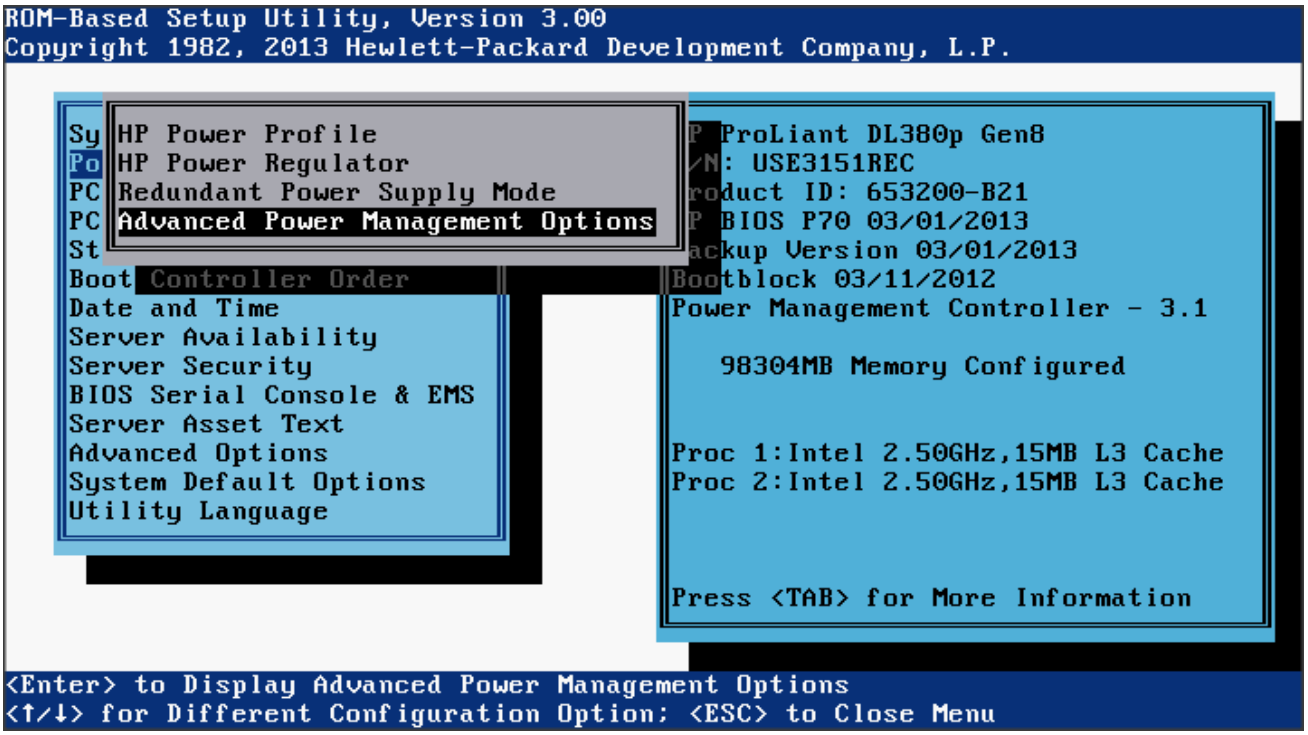


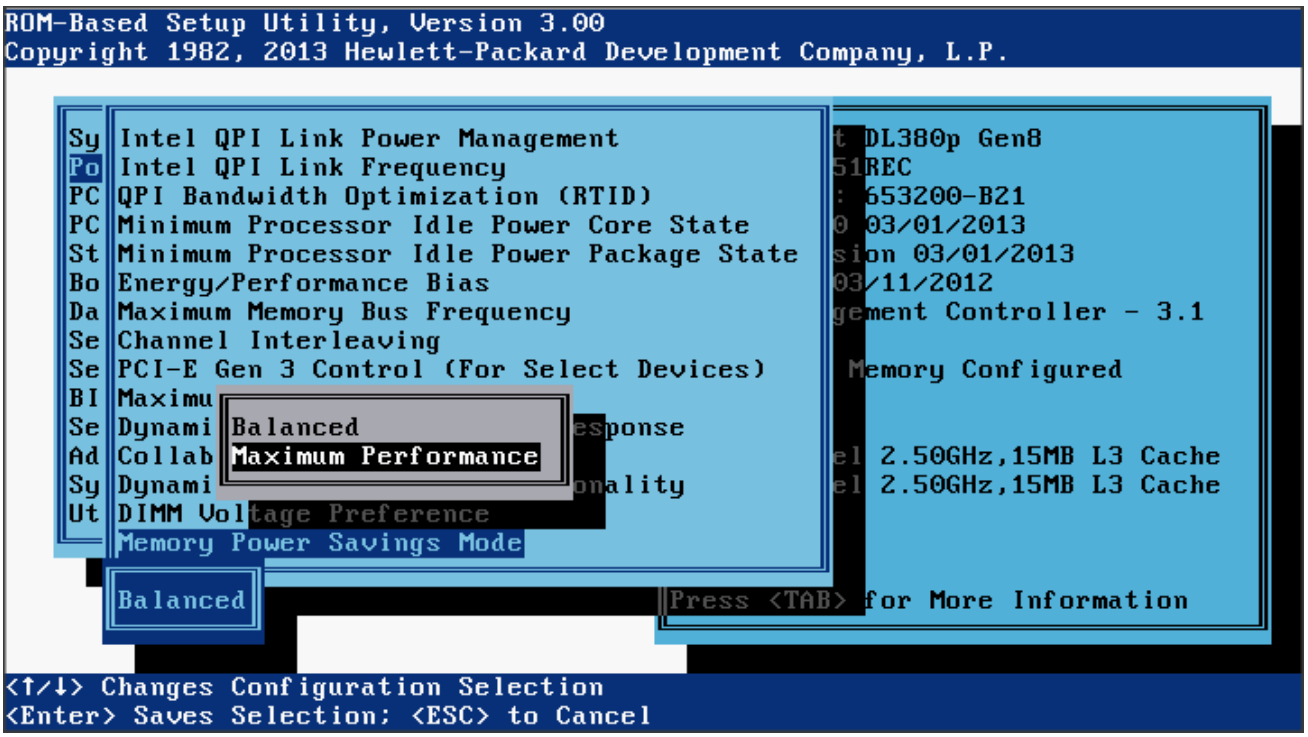




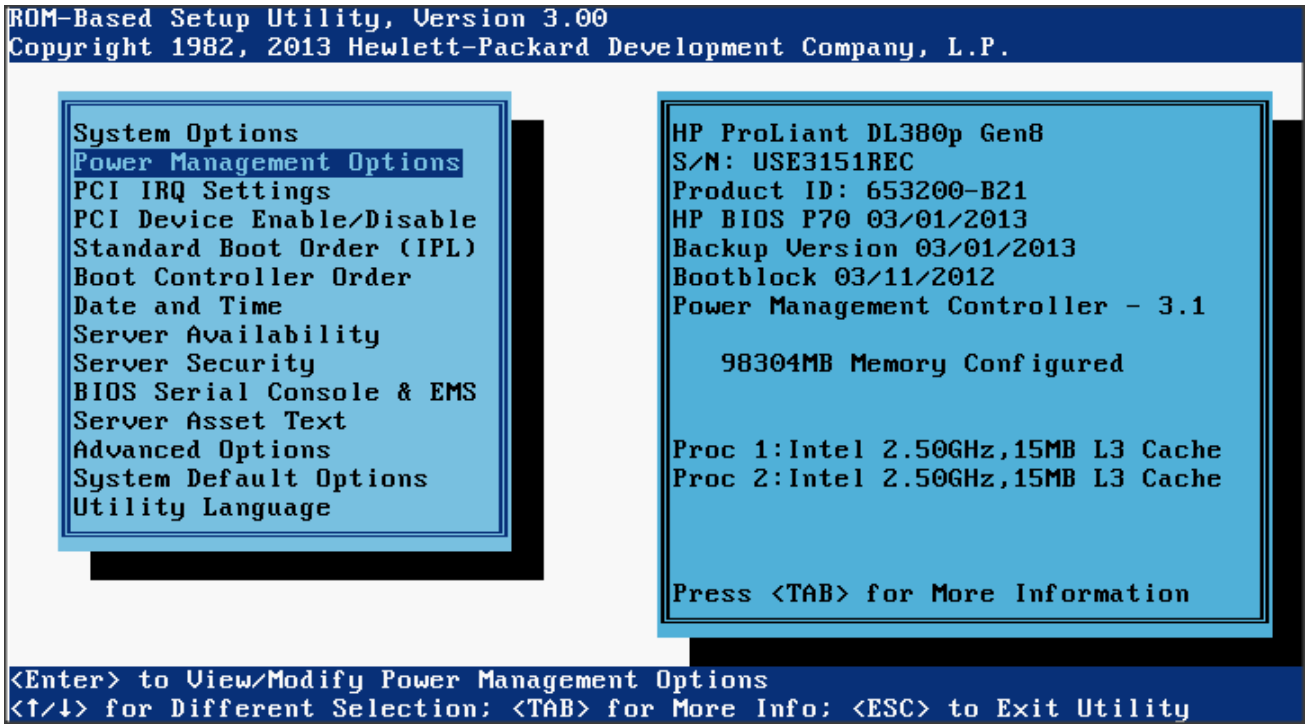
4. Memory Power Savings Mode → Maximum Performance

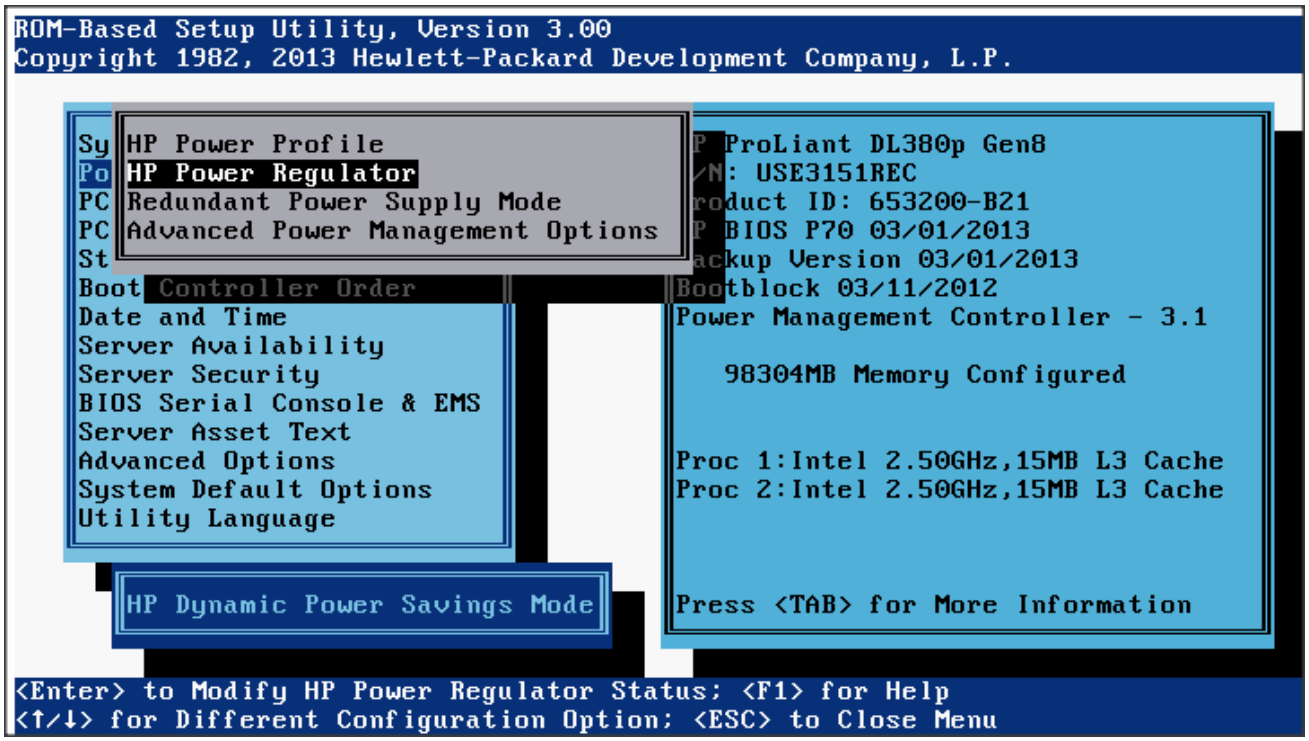


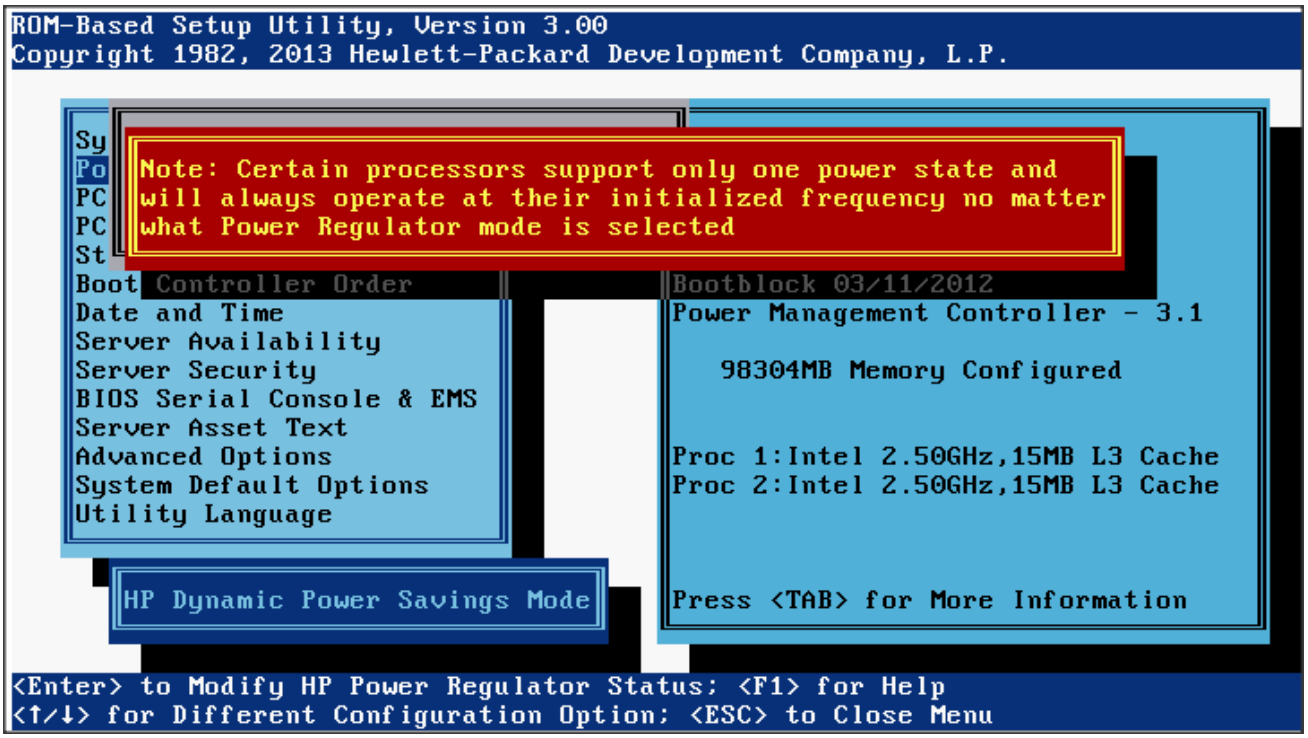


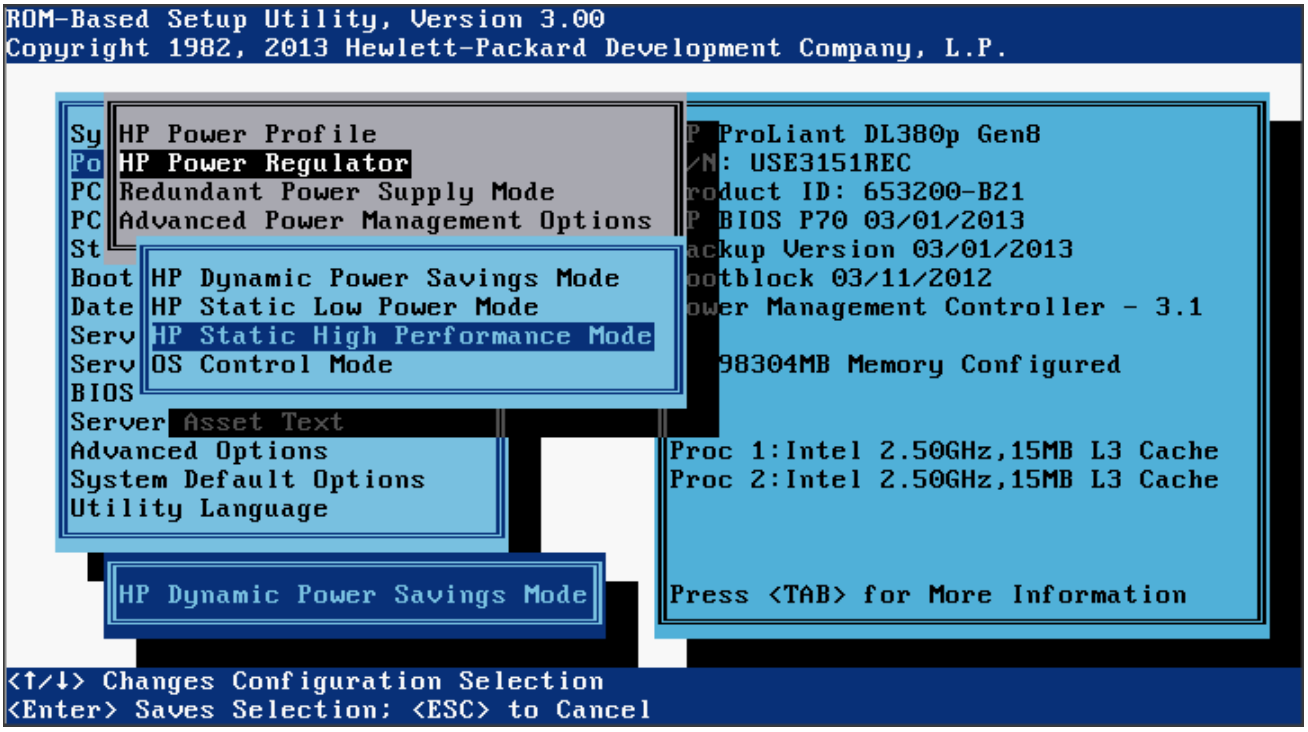


5. HP Power Regulator → HP Static High Performance Mode

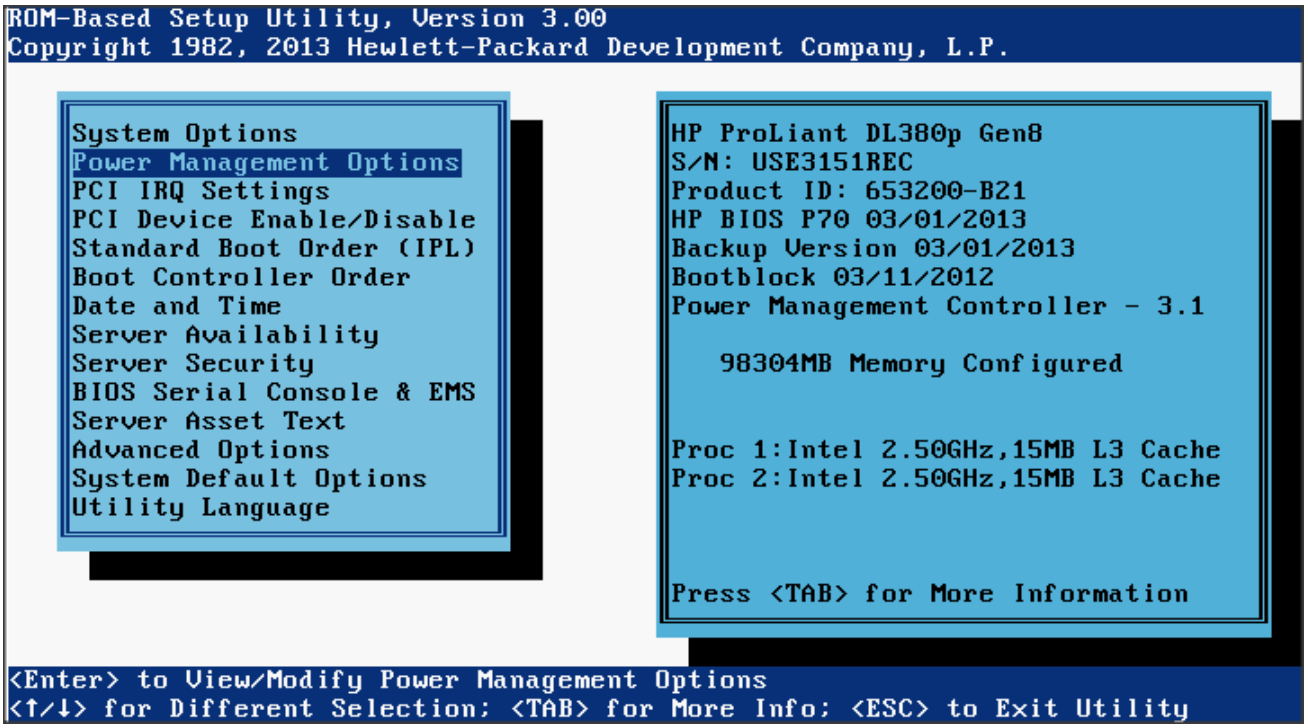


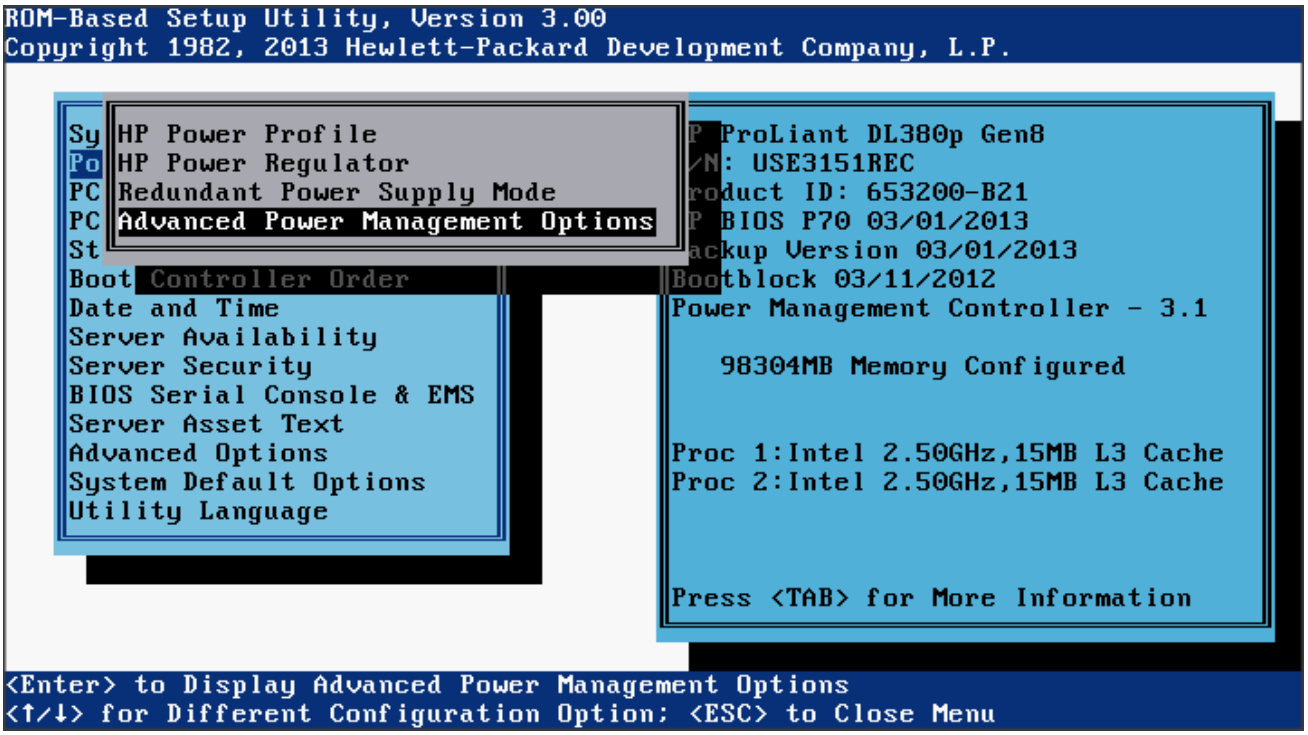


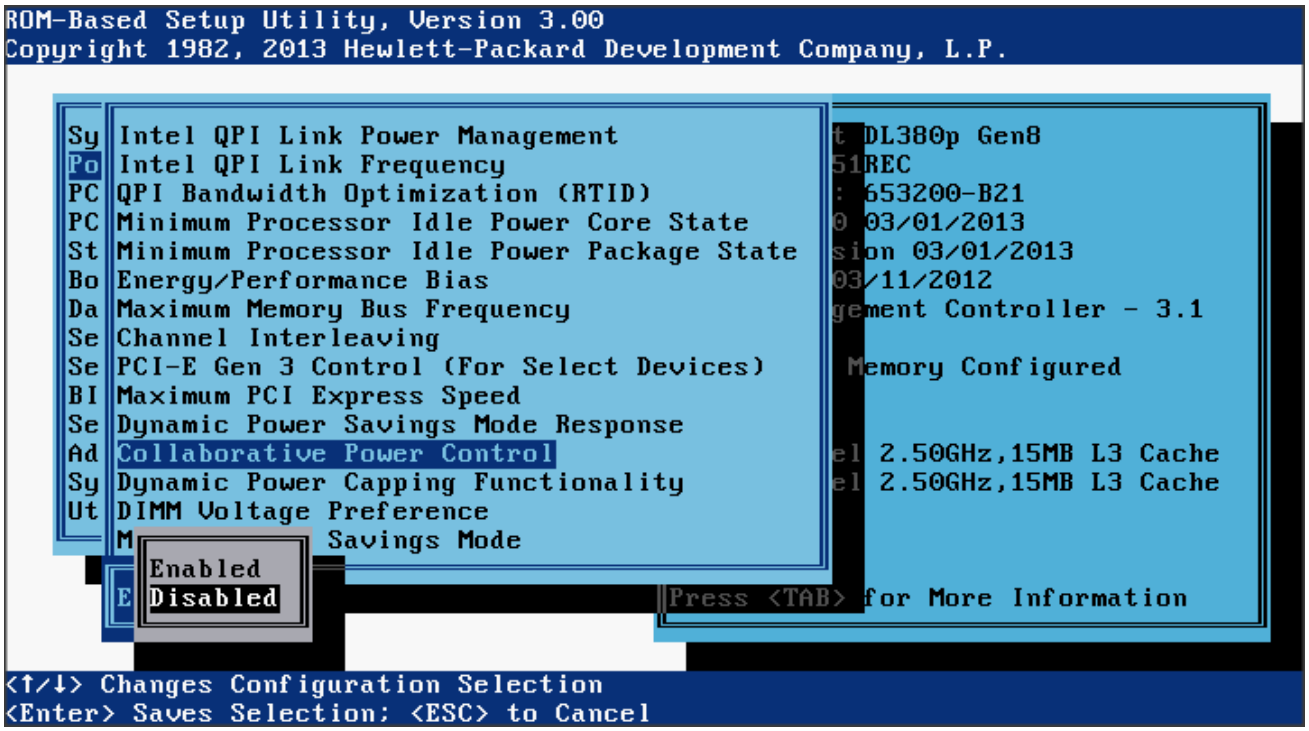




6. Collaborative Power Control → Disabled







7. Power Management → Power Optimized

3.1.1.2 O.S. Tunning

It will be necessary to run the following commands in O.S. level:

a) `blockdev --setra 65536 /dev/sdb`
b) `echo 512 > /sys/block/sdb/queue/nr_requests`
c) `echo noop > /sys/block/sdb/queue/scheduler`

The commands above are not persistent (they are lost after a server reboot) so to make them permanent, the commands must be included in the file `/etc/init.d/boot.local`, that runs every time the server is restarted. But when these commands are included in the file it is necessary to put the full path of the command, ie (/`bin/blockdev`, `/bin/echo`).

For example:

```
/sbin/blockdev --setra 65536 /dev/sdb
/bin/echo 512 > /sys/block/sdb/queue/nr_requests
/bin/echo noop > /sys/block/sdb/queue/scheduler

/sbin/blockdev --setra 65536 /dev/sdc
/bin/echo 512 > /sys/block/sdc/queue/nr_requests
/bin/echo noop > /sys/block/sdc/queue/scheduler
```

```
#! /bin/sh
#
# Copyright (c) 2002 SuSE Linux AG Nuernberg, Germany.  All rights reserved.
#
# Author: Werner Fink <werner@suse.de>, 1996
#         Burchard Steinbild, 1996
#
# /etc/init.d/boot.local
#
# script with local commands to be executed from init on system startup
#
# Here you should add things, that should happen directly after booting
# before we're going to the first run level.
#
/sbin/blockdev --setra 65536 /dev/sdb
/bin/echo 512 > /sys/block/sdb/queue/nr_requests
/bin/echo noop > /sys/block/sdb/queue/scheduler

/sbin/blockdev --setra 65536 /dev/sdc
/bin/echo 512 > /sys/block/sdc/queue/nr_requests
/bin/echo noop > /sys/block/sdc/queue/scheduler
```

These commands have to be executed on HP CEA partitions in RAID 5 mediators, which mean that if there is more than one HP CEA partition in the mediator server, these commands will be applied to all of them.

Note: To check server partitions it can be used the command: `fdisk-l`.

If after reboot the machine the ssh daemon (sshd) is not running, it will be necessary to execute as *root*:

```
# chkconfig sshd on
```

It is necessary to configure the ntp server in order to have always the correct date:

- Execute as root /sbin/yast2
- Go to System -> Date and Time
- Select Region and Time Zone
- In Date and Time subsection select “Change…”
- Check “Synchronize with NTP Server” and put the ntp server ip. Check “Save NTP Configuration” and select “Accept”

If there is a firewall there are some ports that need to be opened:

- ssh
- ftp/sftp
- snmp
- gui: 8023
- jdbcnsl: 1974, 19740
- mstsrv: 1999, 19990

3.2 Disk partition

This chapter presents the requirements for the servers and its partitions.

3.2.1 Mediation and GUI

Machine	Total numbers of HDDs	Spare	Number of HDDs RAID Group	Fault Tolerence	Letter/File System	Gross Size	name	Comments
MEDIATION & GUI	16 (2x450 GB y 14x900 GB)	0	2 (2x450GB)	RAID 1	p1	300MB ext3	/boot	
					p2	35GB ext3	/	
					p3	50GB ext3	/home	
					p4	5GB ext3	/tmp	
					p5	195GB ext3	/var	
					SWAP	96GB ext3	SWAP	Same value than RAM
		1	5 (5x900GB)	RAID 5	p1	500 GB ext3 (valor neto)	/opt/zl	File System options, this partition need the following mount options: **noatime, nodiratime, data=writeback**
					p2	4 TB ext3	/opt/zl/nwi/var/zstore	File System options, this partition need the following mount options: **noatime, nodiratime, data=writeback**
		1	7 (7x900GB)	RAID 5	p1	6,3 TB ext3	/opt/zl/nwi/var/data	File System options, this partition need the following mount options: **noatime, nodiratime, data=writeback**

3.2.2 Output server configuration (DL380p Gen8)

3.3 Firmware update

It is mandatory to have the firmware updated to the newest version of the patch list:

- DL580 G7 last available firmware version: 2012.12.03
- DL380 G7 last available firmware version: 2012.12.02
- DL360 G7 last available firmware version: XXXX
- DL380 Gen8 last available firmware version: 2013.03.01

If the server is Gen8 and the network adapter installed is **HP Ethernet 1Gb 4-port 331FLR Adapter with bootcode Version 1.31** and its version is 2013.02.0, the network adapter may cause a Non-Maskable Interrupt (NMI) to occur on an HP ProLiant server when under heavy network load. This may lead to a Windows BSOD, Linux panic, or VMWare PSOD. The following error codes will be logged in the Integrated Management Log (IML):

PCI Bus Error
Unrecoverable System Error (NMI)

Resolution:

It is necessary to install 2 firmware patches. The patches must be in the path:

```
/home/zhilabs/patches/
```

If the patches are not in that directory, they can be downloaded at:

- Drivers, Software & Firmware for HP ProLiant:
  - DL380 G7 Server
    http://h20566.www2.hp.com/portal/site/hpsc/template.PAGE/public/psi/swdHome/?sp4ts.oid=4091432&spf_p.tpst=swdMain&spf_p.prp_swdMain=wsrp-navigationalState%3DswEnvOID%253D4049%257CswLang%253D%257Caction%253DlistDriver&javax.portlet.begCacheTok=com.vignette.cachetoken&javax.portlet.endCacheTok=com.vignette.cachetoken
  - DL380p Gen8 server :
    http://h20566.www2.hp.com/portal/site/hpsc/template.PAGE/public/psi/swdHome/?sp4ts.oid=5214568&spf_p.tpst=swdMain&spf_p.prp_swdMain=wsrp-navigationalState%3DswEnvOID%253D4049%257CswLang%253D%257Caction%253DlistDriver&javax.portlet.begCacheTok=com.vignette.cachetoken&javax.portlet.endCacheTok=com.vignette.cachetoken
  - DL580p Gen7 server :
    https://h20566.www2.hp.com/portal/site/hpsc/template.PAGE/public/psi/swdHome/?sp4ts.oid=4142792&spf_p.tpst=swdMain&spf_p.prp_swdMain=wsrp-navigationalState%3DswEnvOID%253D4049%257CswLang%253D%257Caction%253DlistDriver&javax.portlet.begCacheTok=com.vignette.cachetoken&javax.portlet.endCacheTok=com.vignette.cachetoken

  Inside these urls, it can be obtained drivers for:
  - Online ROM Flash Component for Linux: Option "BIOS-System ROM"
  - HP Broadcom Online Firmware Upgrade Utility for Linux x86_64- Option "Firmware – Network"

- Other models (HP support center): http://h20566.www2.hp.com/portal/site/hpsc/

3.3.1 Update Ethernet adapter firmware

The steps to update this firmware will depend on the type of the server: probe, mediation (mediation, gui or wizard). They must be executed as **root** user.

3.3.1.1 Probe server

First of all, if HP CEA is already installed in the server, it must be stopped `zen-probe` process in order to stop process `zen`.

```
# stop flowsight
/etc/init.d/zen-probe stop

# startup all gigabit interfaces (normally the name of the interfaces use to match with
eth0,eth1,eth2,eth3 but it is not mandatory and the interfaces name could be different).
Needed a previous check!!!!
ifconfig eth0 up
```

```
ifconfig eth1 up
ifconfig eth2 up
ifconfig eth3 up

# check what is installed (versions, etc. )
./CP020090.scexe -c

# install interface patch, answer question accordingly
./CP020090.scexe

# stop hp-snnp-agnets if installed
/etc/init.d/hp-snmp-agents stop
```

3.3.1.2 Mediation server or GUI server

First of all, if HP CEA is already installed in the server, it must be stopped `zcontrol` process. After that it must be checked that CPU % is lower than before stopping `zcontrol`. Next step is to flush the database. After that it must be stopped `zen-*` and `mstrsrv` processes to stop process `zen`.

```
# stop the remote collectors
/opt/zl/nwi/bin/zcontrol -c stop-scheduling

# check that CPU is going down
top
#flush database
/home/zhilabs/bin/flush.sh

# stop zen, mstrsrv and wizard
/etc/init.d/mstrsrv-wizard stop
/etc/init.d/zen-wizard stop
/etc/init.d/zen-nwi stop

# startup all gigabit interfaces (normally the name of the interfaces use to match with
eth0,eth1,eth2,eth3 but it is not mandatory and the interfaces name could be different).
Needed a previous check!!!!
ifconfig eth0 up
ifconfig eth1 up
ifconfig eth2 up
ifconfig eth3 up

# check what is installed (versions, etc. )
./CP020090.scexe -c

# install interface patch, answer question accordingly
./CP020090.scexe

# stop hp-snnp-agents if installed
/etc/init.d/hp-snmp-agents stop
```

3.3.2 Update firmware on BIOS

This firmware update only applies to Gen8 Servers.

```
# install bios patch, answer question accordingly
./CP019913.scexe

Reboot
```

3.4 Software repository

Before starting the installation, it must be checked that the repository is already configured correctly. To see how to check and configure it, see Appendix A.

3.4.1 Software directory

rpms needed to install HP CEA software are located in the path:

```
/home/zhilabs/software/<release>
```

3.5 HP CEA Software

The HP CEA software is included in the flowsight rpms. These rpms also provide the required 3rd party software dependencies (those that have not been provided by SLES).

3.6 Additional Software

Application Servers (GUI) need a Tomcat server installed. If it is not installed, see Tomcat installation section. Therefore, when installing an application server, the SLES 11 SDK DVD1 is needed, which is also available from Novell's web site.

4 Installing HP *CEA* software

In this point it is covered the installation of the *HP CEA* Application. It is assumed that the system has been properly installed and configured according to the previous instructions. All suggested local Yast repositories should have been installed following the instructions provided in previous section.

4.1 Mediation installation

4.1.1 Uninstalling previous HP CEA software

If there are previous versions of flowsight rpms installed in the target installation machine, then actions described in this chapter should be executed. To check which packages are already installed, execute:

```
# rpm -qa|grep ^flowsight
```

If the list above command is returning rpms then following steps should be done:

4.1.1.1 Stopping Zen services

This procedure will show how to stop HP CEA properly, so no data is lost. The first operation to perform is to prevent HP CEA from starting new dataflows. Only when no dataflow is running, HP CEA can be stopped.
To stop the scheduling of dataflows, use zcontrol.

```
zhilabs@gui:~> /opt/zl/nwi/bin/zcontrol -c stop-scheduling
```

Once the scheduling is disabled, no new dataflows will start. If there is any dataflow running, wait until it finishes.
If there is an online dataflow, check the collected and processing directories to check they're empty. If they're not, wait until it is.

It the processing directory contains many files and you don't want to wait the time it would be needed to process all these files, you can move the files from the processing directory back to the collected directory. But take into account that, if not done properly, data could be duplicated. Ensure that the files being moved are not being used by the dataflow.

Once all the dataflows are idle or stopped, run zcontrol to stop them all. That will flush its data.

```
zhilabs@gui:~> /opt/zl/nwi/bin/zcontrol -c stop-all
```

The next step is to flush the zstore to disk. JDBCNSL can be used to flush all datastores, or ZQL also. Here is an example of how to use ZQL to flush all the datastore of zen5.

```
zhilabs@gui:~> /opt/zl/nwi/bin/zql --zstore /m0/zen5/zstore-frontend --cmd "flush-datastore report;flush-datastore report-summary; flush-datastore index; flush-datastore report-index"
```

If partitioning-write is being used, flush also zen8.

The flushes will provoke CPU consumption from the zen partitions (1 through 4 and 11 to 14). Wait until they have no CPU usage. Be sure they're not doing anything (looking at logs, or waiting a few seconds with no CPU usage).

The only step remaining is to restart HP CEA.

```
zhilabs@gui:~> /etc/init.d/zen-nwi stop
zhilabs@gui:~> /etc/init.d/zen-wizard stop
zhilabs@gui:~> /etc/init.d/mstrsrv-nwi stop
zhilabs@gui:~> /etc/init.d/mstrsrv-wizard stop
```

If some of the processes are still running, they must be stopped manually. To do this, with the top command it can be checked the pids of the `zen-*` and `mstrsrv-*` that are running and kill them manually.


```
# kill -9 20461
```

4.1.1.2 Backup of cron files

After that, a backup of the directory `/etc/cron.d` must be made, so that when all the rpms are installed a comparison with new installed files can be made:

```
# tar cvfz cron-backup-$(date +%s).tar.gz /etc/cron.*
```

4.1.1.3 Backup of Google-maps key

In order to use the Google-key in the new installation, the file containing the key should be backed up (path can vary). This key is defined normally in the following file:

```
# /opt/zl/gui/google-maps.key
```

A backup file should be created. This file will be configured in later steps when installing the GUI

```
# cp /opt/zl/gui/google-maps.key /home/zhilabs/google-maps.key.bck
```

4.1.1.4 Uninstalling flowsight rpms

```
# rpm -qa|grep ^flowsight|xargs zypper remove
```

If there is one or more errors after uninstalling previous software version, those packages should be uninstalled using rpm –e:

```
# rpm -e flowsight-bin-tef-mbbqoe-nwi-oem-4.4.0-36419
```

If there are some packages that cannot be uninstalled with neither of the steps above it should be used:

```
# rpm -e <nombre_rpm> --nopreun --nopostun
```

4.1.1.5 Delete previous cache rpms

If there was installed on the system a previous version of HP CEA software, the rpms stored in the cache from that version must be removed.

```
arcadiev4:/var/cache # find . | grep flow
./zypper/RPMS/flowsight-config-tef-mbbqoe-nwi-colombia-2-4.4.0-36419.noarch.rpm
./zypper/RPMS/flowsight-base-nwi-standard-4.4.0-36403.noarch.rpm
./zypper/RPMS/flowsight-bin-nwi-4.5.0-40358.x86_64.rpm
./zypper/RPMS/flowsight-base-nwi-standard-4.5.0-40358.noarch.rpm
./zypper/RPMS/flowsight-config-wizard-4.4.0-36421.noarch.rpm
./zypper/RPMS/flowsight-gui-standard-4.4.0-36404.x86_64.rpm
./zypper/RPMS/flowsight-bin-wizard-4.4.0-36421.x86_64.rpm
./zypper/RPMS/flowsight-bin-tef-mbbqoe-nwi-oem-4.4.0-36419.x86_64.rpm
./zypp/packages/_tmpRPMcache_/flowsight-bin-tef-mbbqoe-nwi-oem-4.4.0-36419.x86_64.rpm

arcadiev4: rm -rf ./zypper/RPMS/flowsight*
```

4.1.2 Dependencies installation

The first step consists on copying the rpms needed to a local directory within the server. Following table describes the dependencies for each HP CEA package. They are all Open source or Zhilabs proprietary packages:

HP CEA package	Software dependencies
FlowSight base platform package 4.5	monit >= 5.2.5, sysstat, openssh, pbzip2, inotify-tools, incron, libcap1, libcap-progs, smartmontools, dialog, vlan, ethtool, ixgbe, igb
FlowSight binary packages 4.5 (except wizard)	flowsight-base, java-1_6_0-openjdk, jeval, jython >= 2.5.2, python-pycrypto, gwt, python-pysnmp, net-snmp, python-pyasn1, python-beautifulsoup, python-paramiko, jline, libpcap >= 1.1.1, syslog4j, jna, commons-compress, snmp4j
FlowSight binary package 4.5 (wizard only)	flowsight-base, java-1_6_0-openjdk, jeval, JPype, jython >= 2.5.2, python-pycrypto, gwt, python-pysnmp, net-snmp, python-pyasn1, python-beautifulsoup, python-paramiko, jline, libpcap >= 1.1.1, syslog4j, jna, commons-compress, snmp4j
FlowSight GUI package	flowsight-base, tomcat6-zhilabs >= 6.0.20-zl_3, java-1_6_0-openjdk, jline, dialog, webgui-offline-resources, xmlstarlet, commons-compress, log4j-mini
FlowSight Configuration packages	flowsight-bin

4.1.3 Installation of base package

```
# zypper install flowsight-base-nwi-standard-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-base-nwi-standard-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-base-nwi-standard

The following package is not supported by its vendor:
  flowsight-base-nwi-standard

1 new package to install.
Overall download size: 16.0 KiB. After the operation, additional 21.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-base-nwi-standard-4.5.0-40714.noarch (1/1), 16.0 KiB (21.0 KiB unpacked)
Installing: flowsight-base-nwi-standard-4.5.0-40714 [done]
Additional rpm output:
Updating user zhilabs
Updating user oper
Modifying /etc/sudoers...
Reload service monit ..done
Setting up SSH...
Modifying /etc/sysctl.conf...
```

4.1.4 Installation of binary package

```
# zypper install flowsight-bin-nwi-4.5.3-<build_version>.x86_64.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-bin-nwi-4.5.0-40714.x86_64.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-bin-nwi

The following package is not supported by its vendor:
  flowsight-bin-nwi

1 new package to install.
Overall download size: 56.9 MiB. After the operation, additional 237.4 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-bin-nwi-4.5.0-40714.x86_64 (1/1), 56.9 MiB (237.4 MiB unpacked)
Installing: flowsight-bin-nwi-4.5.0-40714 [done]
Additional rpm output:
/etc/monitrc:249: Warning: include files not found '/etc/monit.d/*.monit'
Reinitializing monit daemon
Modifying /etc/sudoers...
Setting capabilities on zen binary
insserv: warning: script 'S15linuxcoe' missing LSB tags and overrides
insserv: warning: script 'S15LinuxCOE-Bundles' missing LSB tags and overrides
insserv: warning: script 'LinuxCOE-Bundles' missing LSB tags and overrides
insserv: warning: script 'linuxcoe' missing LSB tags and overrides

Please install the FlowSight configuration package if it's not installed yet.
```

4.1.5 Installation of configuration package

```
# zypper install flowsight-config-nwi-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-nwi-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-nwi

The following package is not supported by its vendor:
  flowsight-config-nwi

1 new package to install.
Overall download size: 8.7 MiB. After the operation, additional 8.7 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-nwi-4.5.0-40714.noarch (1/1), 8.7 MiB (8.7 MiB unpacked)
Installing: flowsight-config-nwi-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
If this is the first time you install the configuration package, please run /opt/zl/nwi/bin/setup before starting zen service
```

Now, it is time to install the packages of the families in the mediation server.

4.1.6 Device-db package

```
# zypper install flowsight-device-db-nwi-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev3:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-device-db-nwi-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-device-db-nwi

The following package is not supported by its vendor:
  flowsight-device-db-nwi

1 new package to install.
Overall download size: 18.2 MiB. After the operation, additional 17.9 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-device-db-nwi-4.5.0-40714.noarch (1/1), 18.2 MiB (17.9 MiB unpacked)
Installing: flowsight-device-db-nwi-4.5.0-40714 [done]
```

4.1.7 Base mbbqoe package

```
# zypper install flowsight-config-pkg-mbbqoe-base-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-base-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW packages are going to be installed:
  flowsight-config-pkg-mbbqoe-base flowsight-device-db-nwi

The following packages are not supported by their vendor:
  flowsight-config-pkg-mbbqoe-base flowsight-device-db-nwi

2 new packages to install.
Overall download size: 18.2 MiB. After the operation, additional 18.0 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-device-db-nwi-4.5.0-40714.noarch (1/2), 18.2 MiB (17.9 MiB unpacked)
Installing: flowsight-device-db-nwi-4.5.0-40714 [done]
Retrieving package flowsight-config-pkg-mbbqoe-base-4.5.0-40714.noarch (2/2), 43.0 KiB (72.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-base-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

4.1.8 MBB QoE solution packages

```
# zypper install flowsight-config-pkg-mbbqoe-email-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-email-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-email

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-email

1 new package to install.
Overall download size: 6.0 KiB. After the operation, additional 8.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-email-4.5.0-40714.noarch (1/1), 6.0 KiB (8.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-email-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

```
# zypper install flowsight-config-pkg-mbbqoe-file-sharing-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-file-sharing-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-file-sharing

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-file-sharing

1 new package to install.
Overall download size: 6.0 KiB. After the operation, additional 8.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-file-sharing-4.5.0-40714.noarch (1/1), 6.0 KiB (8.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-file-sharing-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

```
# zypper install flowsight-config-pkg-mbbqoe-network-accessibility-4.5.3-
<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-network-accessibility-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-network-accessibility

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-network-accessibility

1 new package to install.
Overall download size: 11.0 KiB. After the operation, additional 45.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-network-accessibility-4.5.0-40714.noarch (1/1), 11.0 KiB (45.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-network-accessibility-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

```
# zypper install flowsight-config-pkg-mbbqoe-streaming-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-streaming-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-streaming

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-streaming

1 new package to install.
Overall download size: 6.0 KiB. After the operation, additional 8.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-streaming-4.5.0-40714.noarch (1/1), 6.0 KiB (8.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-streaming-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

```
# zypper install flowsight-config-pkg-mbbqoe-web-browsing-4.5.3-<build_version>.noarch.rpm
```

```
arcadiev2:/home/zhilabs/software/4.5_SP3-40358 # zypper install flowsight-config-pkg-mbbqoe-web-browsing-4.5.0-40358.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-web-browsing

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-web-browsing

1 new package to install.
Overall download size: 6.0 KiB. After the operation, additional 9.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-web-browsing-4.5.0-40358.noarch (1/1), 6.0 KiB (9.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-web-browsing-4.5.0-40358 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

4.1.9 Marketing package

zypper install flowsight-bin-pkg-marketing-4.5.3-<build_version>.x86_64.rpm

```
mbbqoe-test-13:/home/zhilabs # zypper install flowsight-bin-pkg-marketing-4.5.3-49982.x86_64.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-bin-pkg-marketing

The following package is not supported by its vendor:
  flowsight-bin-pkg-marketing

1 new package to install.
Overall download size: 6.0 KiB. After the operation, additional 9.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-bin-pkg-marketing-4.5.3-49982.x86_64 (1/1), 6.0 KiB (9.0 KiB unpacked)
Installing: flowsight-bin-pkg-marketing-4.5.3-49982 [done]
Additional rpm output:

Please install the FlowSight configuration package if it's not installed yet.
```

zypper install flowsight-config-pkg-marketing-4.5.3-<build_version>.noarch.rpm

```
mbbqoe-test-13:/home/zhilabs # zypper install flowsight-config-pkg-marketing-4.5.3-49982.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-marketing

The following package is not supported by its vendor:
  flowsight-config-pkg-marketing

1 new package to install.
Overall download size: 22.0 KiB. After the operation, additional 71.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-marketing-4.5.3-49982.noarch (1/1), 22.0 KiB (71.0 KiB unpacked)
Installing: flowsight-config-pkg-marketing-4.5.3-49982 [done]
```

zypper install flowsight-config-pkg-marketing-customer-4.5.3-<build_version>.noarch.rpm

```
mbbqoe-test-13:/home/zhilabs # zypper install flowsight-config-pkg-marketing-customer-4.5.3-49982.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-marketing-customer

The following package is not supported by its vendor:
  flowsight-config-pkg-marketing-customer

1 new package to install.
Overall download size: 39.0 KiB. After the operation, additional 49.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-marketing-customer-4.5.3-49982.noarch (1/1), 39.0 KiB (49.0 KiB unpacked)
Installing: flowsight-config-pkg-marketing-customer-4.5.3-49982 [done]
```

4.1.10 Configuration

4.1.10.1 Setting up zen service

After HP CEA has been installed, it is necessary to perform some final steps.

From now on, it is no longer necessary to use the root user; instead, user **zhilabs** should be used. This will be denoted by the $ prompt in the instructions.

It is necessary to run the `/opt/zl/nwi/bin/setup` script and configure the values. Default values will work for the installation.

```
arcadiev3:/home/zhilabs/software/4.5_SP4-40659 # su zhilabs
zhilabs@arcadiev3:~/software/4.5_SP4-40659> /opt/zl/nwi/bin/setup
Is this root zen? (default: yes):
 Is this root zen?: "yes"
Local peer name (default: /m0/zen0):
 Local peer name: "/m0/zen0"
Local IP address (default: 127.0.0.1):
 Local IP address: "127.0.0.1"
Local port (default: 8000):
 Local port: "8000"
Config file (default: /opt/zl/nwi/etc/flowsight-standalone.cfg):
 Config file: "/opt/zl/nwi/etc/flowsight-standalone.cfg"
System ready. Configuration written into /etc/sysconfig/zen-nwi file.
zhilabs@arcadiev3:~/software/4.5_SP4-40659>
```

4.1.11 Configuring remote-collectors

A remote collector is an HP CEA component with the objective of grabbing files from a remote source. This component can use different protocols such sftp and ftp. Within the configuration several parameters can also be configured.

HP CEA 4.5 includes specific configuration examples that can be used to configure the different remote-collectors needed to collect the XDRs files from the Probe servers. These configuration examples are created with "`.install`" suffix in the `/opt/zl/nwi/etc/base/`directory:

```
# ls /opt/zl/nwi/etc/base/*.install
/opt/zl/nwi/etc/base/gn-remote-collectors.cfg.install
/opt/zl/nwi/etc/base/gn_session-remote-collectors.cfg.install
/opt/zl/nwi/etc/base/gn_signaling-remote-collectors.cfg.install
/opt/zl/nwi/etc/base/nic_counters-remote-collectors.cfg.install
/opt/zl/nwi/etc/base/remote-collectors.cfg.install
/opt/zl/nwi/etc/base/remote-collectors-session.cfg.install
/opt/zl/nwi/etc/base/thresholds.cfg.install
```

The best way to add the remote collector is to have a unique file in order to place and define all remote collectors, so it is easier to manage. To build this file it must be noticed that the settings on each remote collector should be based on the configuration that is in the ".install" and evaluate if it is going to be installed on a distributed architecture, in this case you must configure the remote collectors to share the load.

Configuration should be also adapted in order to meet deployment requirements. Following example describes a remote-collector with the main parameters:

```
############################################################
# Gn remote collectors
############################################################
remote-collector gn-applevel1
  host              applevel
  user              zhilabs
  password          xxxxxxx
  remote-path       /opt/zl/probe/var/xdrs
  filter            "^A.*Gn-NODE.*.csv$"
  local-path        /opt/zl/nwi/var/data/gn/processed
  local-file-name   ${file_basename}-${host}.${file_extension}
  schedule          /workflow/schedule/every-five-minutes
  keep-remote-file  no
  ignore-last-file  no
  pid-control       on
  use-compression   yes
```

```
  compress-files    yes
  recursive         no
!
```

- remote-collector: Name of the remote-collector.
- host: name of the remote server
- user: user for the connection
- password: Password required for the connection (if needed)
- remote-path: Remote path from where files are collected.
- filter: Pattern of the files that are collected. Regular expressions can be used.
- local-path: contains the name of the local directory to which the files are copied to.
- local-file-name: can be used to rename the name of the local file.
- schedule: Indicates the frequency of the execution of the remote-collector.
- keep-remote-file: Indicates if the remote file has to be kept after copied.
- use-compression: Indicates if compression should be used while transferring the file.
- compress-files: indicates if files have to be compressed locally after been copied.
- recursive: indicates of recursive searches from remote-path should be executed.

Remote-collector in distributed architecture:

To collect the files within a distributed architecture it must be defined one file per server with the configuration of each one. To do this it is used one "filter" to specify the files that the remote-collector is getting from the probe.

The following example shows 50% distribution architecture:

```
############################################################
# Gn Session remote collectors
############################################################
remote-collector gn_session-applevel
  host        applevel
  user        zhilabs
  remote-path /opt/zl/probe/var/V45
  filter      "^A.*Gn-Session-m(0|1|2|3|4|5|6|7|8|9)-.*.csv$"
  local-path  /opt/zl/nwi/var/data/gn_session/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-minute
  keep-remote-file no
  ignore-last-file no
  pid-control on
  use-compression yes
  compress-files yes
  recursive        yes
!
```

```
############################################################
# Gn Session remote collectors
############################################################
remote-collector gn_session-applevel
  host        applevel
  user        zhilabs
  remote-path /opt/zl/probe/var/V45
  filter      "^A.*Gn-Session-m(10|11|12|13|14|15|16)-.*.csv$"
  local-path  /opt/zl/nwi/var/data/gn_session/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-minute
  keep-remote-file no
  ignore-last-file no
  pid-control on
  use-compression yes
  compress-files yes
```

```
  recursive        yes
!
```

Example of 33% distribution architecture with 3 mediation servers:

```
################################################
# PDU Remote data collectors for probe3
################################################
remote-collector gn_probe3_med1
  host        probe3
  user        zhilabs
  remote-path /opt/zl/probe/var/xdrs
  filter      "^A.*Gn-PDU-m(2|3|4)-.*.csv$"
  local-path  /opt/zl/nwi/var/data/probe/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-minute
  use-compression yes
  compress-files yes
  ignore-last-file no
  pid-control on
  keep-remote-file no
  recursive        no
!
```

```
################################################
# PDU Remote data collectors for probe3
################################################
remote-collector gn_probe3_med2
  host        probe3
  user        zhilabs
  remote-path /opt/zl/probe/var/xdrs
  filter      "^A.*Gn-PDU-m(5|6|7)-.*.csv$"
  local-path  /opt/zl/nwi/var/data/probe/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-minute
  use-compression yes
  compress-files yes
  ignore-last-file no
  pid-control on
  keep-remote-file no
  recursive        no
!
```

```
################################################
# PDU Remote data collectors for probe3
################################################
remote-collector gn_probe3_med3
  host        probe3
  user        zhilabs
  remote-path /opt/zl/probe/var/xdrs
  filter      "^A.*Gn-PDU-m(8|9|10)-.*.csv$"
  local-path  /opt/zl/nwi/var/data/probe/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-minute
  use-compression yes
  compress-files yes
  ignore-last-file no
```

```
  pid-control on
  keep-remote-file no
  recursive        no
!
```

The session, http-session and probe files must be distributed always based on the numerical value after “m”, usually this value will be between 1 and 16, but it depends on the configuration of the probe. This is important because these files have user sessions. “mXX” number is calculated based in the user id and all sessions from the same user are processed in the same server.

The signaling files are always generated with “m0” so the distinction has to be done by another method; in this case it is recommended to configure the filter with the minute when the file was generated:

```
############################################################
# Gn signaling remote collectors
############################################################
remote-collector gn_signaling
  host        applevel
  user        zhilabs
  remote-path /opt/zl/probe/var/V45
  filter      "^A.*(5|6|7|8|9)-Gn-signaling.*.csv$"
  local-path  /opt/zl/nwi/var/data/gn_signaling/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-five-minutes
  use-compression yes
  compress-files yes
  ignore-last-file no
  keep-remote-file no
  pid-control on
  recursive        yes
!
```

```
############################################################
# Gn signaling remote collectors
############################################################
remote-collector gn_signaling
  host        applevel
  user        zhilabs
  remote-path /opt/zl/probe/var/V45
  filter      "^A.*(0|1|2|3|4)-Gn-signaling.*.csv$"
  local-path  /opt/zl/nwi/var/data/gn_signaling/collected
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-five-minutes
  use-compression yes
  compress-files yes
  ignore-last-file no
  keep-remote-file no
  pid-control on
  recursive        yes
!
```

Nic-counter files are placed on the GUI server because it does not have strong load:

```
############################################################
# Remote collectors
############################################################
#remote-collector nic_counters-gui
```

```
#  host        gui
#  user        zhilabs
#  remote-path /opt/zl/nwi/var/data/nic_counters/processed
#  filter      "^A.*-201306.*if-stats.*.csv.gz$"
#  local-path  /opt/zl/nwi/var/data/nic_counters/collected
#  local-file-name ${file_basename}-${host}.${file_extension}
#  schedule    /workflow/schedule/every-fifteen-minutes
#  ignore-last-file no
#  pid-control on
#  keep-remote-file yes
#  recursive        yes
#!
```

The NODE files are not used in the v 4.5 but the probe continues generating them, so the procedure is to keep them in a directory for a period of two days. After these two days the files are deleted.

```
################################################
# Remote data collectors
################################################
remote-collector gn_NODE
  host        applevel
  user        zhilabs
  remote-path /opt/zl/probe/var/V45
  filter      "^A.*Gn-NODE.*.csv$"
  local-path  /opt/zl/nwi/var/data/gn/processed
  local-file-name ${file_basename}-${host}.${file_extension}
  schedule    /workflow/schedule/every-minute
  use-compression yes
  compress-files yes
  ignore-last-file no
  pid-control on
  keep-remote-file no
!
```

4.1.11.1 SSH authentication

In order to file transferring mechanism between each pair of servers works properly, it is necessary to authenticate them. Doing this, it is avoided that every file transfer needs manual authentication. Assuming there are two servers, serverA and serverB, the following commands must be executed in each server.

The following command is in charge of generating the ssh public key. This will be interchanged afterwards between servers.

```
# ssh-keygen -t rsa
```

The output of the command below could be something like this:

```
zhilabs@serverA: > ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/zhilabs/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/zhilabs/.ssh/id_rsa.
Your public key has been saved in /home/zhilabs/.ssh/id_rsa.pub.
The key fingerprint is:
28:b3:b5:32:72:84:9d:c9:3a:cd:09:6d:d1:13:25:9b zhilabs@CEM-HP-GUI
The key's randomart image is:
+--[ RSA 2048]----+
|      o..        |
```

```
|      . =        |
|     . E         |
|    = + o        |
|   o @ o S       |
|    B * .        |
|   + O .         |
|    + o          |
|                 |
+-----------------+
```

This command generates the public key in the following path **/home/zhilabs/.ssh/id_rsa.pub**. This key is completely dependent on the user that has executed de command, so that, the key is only valid for the user that executed the command. In this case it is mandatory do it with user zhilabs.

Once the key (for user zhilabs) has been generated in both servers, the following step consist on interchanging this key each other. The following command must be execute in both sides to perform this action:

```
# ssh-copy-id -i /home/zhilabs/.ssh/id_rsa.pub <serverB>
```

```
zhilabs@serverA:~> ssh-copy-id -i /home/zhilabs/.ssh/id_rsa.pub serverB
Warning: Permanently added 'mediation2,10.223.221.165' (RSA) to the list of known
hosts.
Now try logging into the machine, with "ssh 'mediation2'", and check in:

  .ssh/authorized_keys

to make sure we haven't added extra keys that you weren't expecting.
```

Note: parameters serverA and serverB, can be both the host IP or, the name of the server if it is configured in the file /etc/hosts

4.1.12 Reference-files

Before starting the application, it must be checked and configured reference-files.

4.2 Wizard installation

4.2.1 Binary package

```
# zypper install flowsight-bin-wizard-4.5.3-<build_version>.x86_64.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-bin-wizard-4.5.0-40714.x86_64.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-bin-wizard

The following package is not supported by its vendor:
  flowsight-bin-wizard

1 new package to install.
Overall download size: 57.2 MiB. After the operation, additional 238.6 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-bin-wizard-4.5.0-40714.x86_64 (1/1), 57.2 MiB (238.6 MiB unpacked)
Installing: flowsight-bin-wizard-4.5.0-40714 [done]
Additional rpm output:
Reinitializing monit daemon
Modifying /etc/sudoers...
Setting capabilities on zen binary
insserv: warning: script 'S15linuxcoe' missing LSB tags and overrides
insserv: warning: script 'S15LinuxCOE-Bundles' missing LSB tags and overrides
insserv: warning: script 'LinuxCOE-Bundles' missing LSB tags and overrides
insserv: warning: script 'linuxcoe' missing LSB tags and overrides
Monitoring zen-nwi, please wait (it may take a while)
Monitoring mstrsrv-nwi, please wait (it may take a while)

Please install the FlowSight configuration package if it's not installed yet.
```

4.2.2 Configuration package

```
# zypper install flowsight-config-wizard-4.5.3-<build_version>.noarch.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-wizard-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-wizard

The following package is not supported by its vendor:
  flowsight-config-wizard

1 new package to install.
Overall download size: 11.0 KiB. After the operation, additional 29.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-wizard-4.5.0-40714.noarch (1/1), 11.0 KiB (29.0 KiB unpacked)
Installing: flowsight-config-wizard-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
If this is the first time you install the configuration package, please run /opt/zl/wizard/bin/setup before starting zen service
```

4.2.3 Scripts package

```
# zypper install flowsight-scripts-wizard-4.5.3-<build_version>.noarch.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-scripts-wizard-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-scripts-wizard

The following package is not supported by its vendor:
  flowsight-scripts-wizard

1 new package to install.
Overall download size: 59.0 KiB. After the operation, additional 157.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-scripts-wizard-4.5.0-40714.noarch (1/1), 59.0 KiB (157.0 KiB unpacked)
Installing: flowsight-scripts-wizard-4.5.0-40714 [done]
You have new mail in /var/mail/zhilabs
```

4.2.4 Configuration

In order to finish the installation, the wizard setup must be executed, answering the default options to all questions, **but changing the server in which the GUI is installed**. The script must be executed as user **zhilabs**.
Depending on the installition type (centralized or distributed) the script should be executed as follows:

Centralized installation – Wizards run in a unique server.

```
/opt/zl/wizard/bin/setup -c <host>
#centralised: wizard configs are imported and executed in <host>
```

Distributed installation – Wizard run on several mediation servers. The script must be executed in all the servers running wizard.

```
/opt/zl/wizard/bin/setup -g <host> -w "wizard-host1 wizard-host2"
#distributed:
         -g <host>: gui host (default: localhost)
         -w "wizard-host1 wizard-host2...": hosts where there are the wizard
             configs (default: localhost)
```

```
zhilabs@atchoumv1:/opt/zl/wizard/bin>  /opt/zl/wizard/bin/setup -g atchoumv1 -w atchoumv1
 Is this root zen?: "yes"
 Local peer name: "/mwizard/zen0"
 Local IP address: "127.0.0.2"
 Local port: "7000"
 Config file: "/opt/zl/wizard/etc/flowsight-standalone.cfg"
 Flowsight installation path: "/opt/zl/nwi"
 Flowsight gui machine: "atchoumv1"
System ready. Configuration written into /etc/sysconfig/zen-wizard file.
```

After configuring HP *CEA*, HP *CEA's* `zen-wizard` service for the installed instance can be started by using its own initscript, as follows:

```
# /etc/init.d/zen-wizard start

/etc/init.d/zen-wizard start
/etc/init.d/zen-wizard stop
/etc/init.d/zen-wizard restart
```

4.2.5 Output server configuration

In some deployments it may be required to configure an output-server. An output-server is a sever running wizard reports only. Basic requirement for this type of server is to have a large capacity to store all the XDRs used for the generation of the reports. These XDRs are collected from the normal mediations servers, so it is needed to configure remote-collectors for this purpose.

In case of having several mediation servers it is recommended to define additional schedulers to alloy the execution of these remote-collectors separately.

Additional schedulers are defined in configuration files deployed in /opt/zl/nwi/etc/base directory.
An example to define a new scheduler can be as follows:

```
 workflow-schedule /workflow/schedule/every-15-minutes-A
  minute 0,15,30,45
!
```

4.3 GUI installation

4.3.1 Uninstalling previous HP CEA software

Refer to point 4.1.1.4.

4.3.2 GUI packages

For the installation of a GUI type server the following HP CEA packages should be installed.

4.3.2.1 Base package

```
# zypper install flowsight-base-nwi-standard-4.5.3-<build_version>.noarch.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-base-nwi-standard-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-base-nwi-standard

The following package is not supported by its vendor:
  flowsight-base-nwi-standard

1 new package to install.
Overall download size: 16.0 KiB. After the operation, additional 21.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-base-nwi-standard-4.5.0-40714.noarch (1/1), 16.0 KiB (21.0 KiB unpacked)
Installing: flowsight-base-nwi-standard-4.5.0-40714 [done]
Additional rpm output:
Updating user zhilabs
Updating user oper
Modifying /etc/sudoers...
Reload service monit ..done
Setting up SSH...
Modifying /etc/sysctl.conf...
```

4.3.2.2 Binary package

```
# zypper install flowsight-bin-nwi-4.5.3-<build_version>.x86_64.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-bin-nwi-4.5.0-40714.x86_64.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-bin-nwi

The following package is not supported by its vendor:
  flowsight-bin-nwi

1 new package to install.
Overall download size: 56.9 MiB. After the operation, additional 237.4 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-bin-nwi-4.5.0-40714.x86_64 (1/1), 56.9 MiB (237.4 MiB unpacked)
Installing: flowsight-bin-nwi-4.5.0-40714 [done]
Additional rpm output:
/etc/monitrc:249: Warning: include files not found '/etc/monit.d/*.monit'
Reinitializing monit daemon
Modifying /etc/sudoers...
Setting capabilities on zen binary
insserv: warning: script 'S15linuxcoe' missing LSB tags and overrides
insserv: warning: script 'S15LinuxCOE-Bundles' missing LSB tags and overrides
insserv: warning: script 'LinuxCOE-Bundles' missing LSB tags and overrides
insserv: warning: script 'linuxcoe' missing LSB tags and overrides

Please install the FlowSight configuration package if it's not installed yet.
```

4.3.2.3 Device-db package

```
# zypper install flowsight-device-db-nwi-4.5.3-<build_version>.noarch.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-device-db-nwi-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-device-db-nwi

The following package is not supported by its vendor:
  flowsight-device-db-nwi

1 new package to install.
Overall download size: 18.2 MiB. After the operation, additional 17.9 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-device-db-nwi-4.5.0-40714.noarch (1/1), 18.2 MiB (17.9 MiB unpacked)
Installing: flowsight-device-db-nwi-4.5.0-40714 [done]
```

4.3.2.4 Configuration packages

```
# zypper install flowsight-config-pkg-mbbqoe-base-4.5.3-<build_version>.noarch.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-base-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-base

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-base

1 new package to install.
Overall download size: 43.0 KiB. After the operation, additional 72.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-base-4.5.0-40714.noarch (1/1), 43.0 KiB (72.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-base-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

```
# zypper install flowsight-config-pkg-mbbqoe-gui-4.5.3-<build_version>.noarch.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-config-pkg-mbbqoe-gui-4.5.0-40714.noarch.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-config-pkg-mbbqoe-gui

The following package is not supported by its vendor:
  flowsight-config-pkg-mbbqoe-gui

1 new package to install.
Overall download size: 6.0 KiB. After the operation, additional 10.0 KiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-config-pkg-mbbqoe-gui-4.5.0-40714.noarch (1/1), 6.0 KiB (10.0 KiB unpacked)
Installing: flowsight-config-pkg-mbbqoe-gui-4.5.0-40714 [done]
Additional rpm output:
Shutting down CRON daemon..done
Starting CRON daemon..done
```

4.3.2.5 GUI package

```
# zypper install flowsight-gui-standard-4.5.3-<build_version>.x86_64.rpm
```

```
atchoumv1:/home/zhilabs/software/4.5_SP4-40714 # zypper install flowsight-gui-standard-4.5.0-40714.x86_64.rpm
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
  flowsight-gui-standard

The following package is not supported by its vendor:
  flowsight-gui-standard

1 new package to install.
Overall download size: 29.1 MiB. After the operation, additional 30.5 MiB will be used.
Continue? [y/n/?] (y): y
Retrieving package flowsight-gui-standard-4.5.0-40714.x86_64 (1/1), 29.1 MiB (30.5 MiB unpacked)
Installing: flowsight-gui-standard-4.5.0-40714 [done]
Additional rpm output:
Modifying /etc/sudoers...
Modifying /etc/sysconfig/cron...
Reinitializing monit daemon
please run /opt/zl/gui/bin/setup-gui before starting the application server.
```

4.3.3 Configuration

4.3.3.1 Setting up Zen service

Refer to point 4.1.10.1.

4.3.3.2 Setting up master-server service for preconfigured reports

In order to configure the master-server it is mandatory to create a file: `/opt/zl/nwi/etc/base/mstrsrv.cfg` in which all the URLs of the servers must be defined. File `/opt/zl/nwi/etc/base/strsrv.cfg.example` can be used to help creating the configuration file.

Basically the configuration file should contain the following:

- Inside the `jdbc-mstrsrv server` structure there should be specified a url for every mediation server from which it is needed to extract information.
- It is necessary to define the listening port, normally the 1999.
- Connection parameters, normally keeping as defined in the example file.

In the following example the Master-Server is defined to connect to 3 mediation servers:

```
#
# (c) 2008-2012 Zhilabs
#
# mstrsrv configuration example
#
# $Id: mstrsrv.cfg.example 39500 2013-05-22 17:42:06Z $
#
jdbc-mstrsrv server
   jdbc-url      jdbc:zstore://<mediation-host1>:1974//m0/zen5/zstore-frontend
   jdbc-url      jdbc:zstore://<mediation-host2>:1974//m0/zen5/zstore-frontend
   jdbc-url      jdbc:zstore://<mediation-host3>:1974//m0/zen5/zstore-frontend

   connection-timeout 20000
   transaction-timeout 300000
   connection-inactivity 300000

   port 1999
   log-level     info
!
```

After creating the configuration file the *master-server* service can be operated by using its own initscript, as follows:

```
/etc/init.d/mstrsrv-nwi start
/etc/init.d/mstrsrv-nwi stop
/etc/init.d/mstrsrv-nwi restart
```

4.3.3.3 Setting up master-server service for wizard reports

Additionally in case of using the master-server service for the wizard reports it is also needed to create the `/opt/zl/wizard/etc/base/mstrsrv.cfg` configuration file, containing the servers running the offline reports.

Syntax is similar as for preconfigured reports:

- Inside the `jdbc-mstrsrv server` structure there should be one entry defined for every server running off-line reports.
- It is necessary to define the listening port, normally the 19990.

In the following example the Master-Server is defined to connect to 2 wizard servers:

```
-------------------------------------------------------------------------
jdbc-mstrsrv server
   …
   jdbc-url      jdbc:zstore://<host1>:19740//mwizard/zen5/zstore-frontend
   jdbc-url      jdbc:zstore://<host2>:19740//mwizard/zen5/zstore-frontend

   connection-timeout 30000
   transaction-timeout 300000
   connection-inactivity 300000

   port 19990
   log-level     info
…
!
-------------------------------------------------------------------------
```

The *wizard master-server* service can be operated by using its own initscript, as follows:

```
/etc/init.d/mstrsrv-wizard start
/etc/init.d/mstrsrv-wizard stop
/etc/init.d/mstrsrv-wizard restart
```

4.3.3.4 Adding the Google-Maps Key

It is necessary to create the file that is going to contain the Google-Maps Key.

In case there is not a Google license from a previous installation, a new one has to be created. It is mandatory to create it as root user:

```
# touch /opt/zl/gui/google-maps.key

# And the key is added:
echo <GOOGLE_MAPS_KEY> > /opt/zl/gui/google-maps.key
```

If there is a Google-license from a previous HP CEA installation it can be used:

```
# cp /home/zhilabs/google-maps.key.bck /opt/zl/gui/google-maps.key
```

4.3.3.5 Adding the possibility to download large files

It is needed to download large csv files from the GUI. Modify the file /etc/tomcat6/server.xml and change:

```
    <Connector port="8080" protocol="HTTP/1.1"
        connectionTimeout="20000"
```

```
        redirectPort="8443" />
```

Adding the parameter:

```
    <Connector port="8080" protocol="HTTP/1.1"
        connectionTimeout="20000"
        redirectPort="8443" maxPostSize="0" />
```

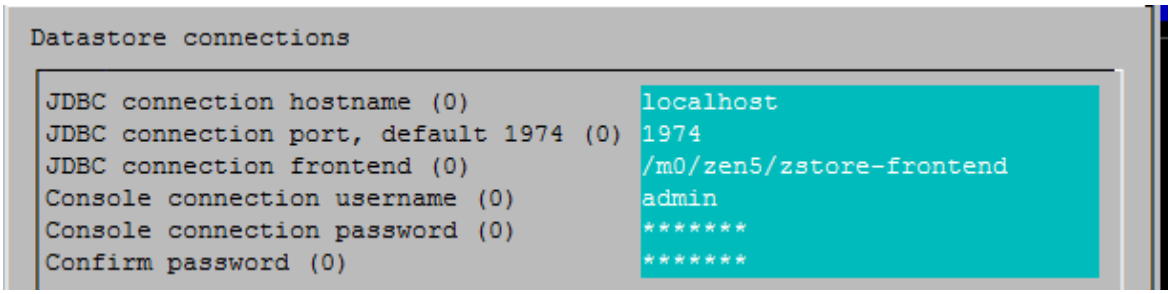
4.3.3.6 Setting up GUI

Once the installation of the rpms have been done on the GUI server, then using the **zhilabs** user it is necessary to execute the following script in order to configure the GUI:

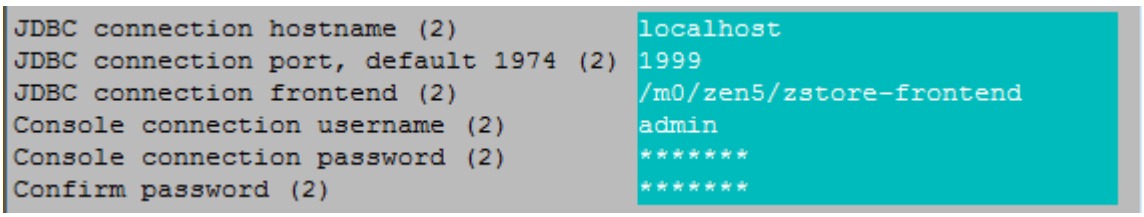
```
/opt/zl/gui/bin/setup-gui
```

Following points have to be taken into consideration:

- It has to be configured the GUI host database. The default port for the frontend is `1974`. The frontend runs in `/m0/zen5/zstore-frontend`. Credentials are admin/zhilabs:



- In case master-server functionality is used for preconfigured reports then it should be added to the GUI.
  Hostname should contain the name of the host running the master-server service. The default port for the frontend is the one defined in the `/opt/zl/nwi/etc/base/mstrsrv.cfg` file, normally `1999`. The frontend runs in /m0/zen5/zstore-frontend. Credentials are admin/zhilabs:



  In master-server is not used then it has to be configured every mediation host. In this case the default port for the frontend is `1974`. The frontend runs in `/m0/zen5/zstore-frontend`. Credentials are admin/zhilabs.

- The information concerning the wizard has to be also configured in the GUI.
  In case master-server functionality is used for the off-line reports then it has be added to the GUI.
  Hostname should contain the name of the host running the master-server service for off-line reports. The default port for the frontend is the one defined in the `/opt/zl/nwi/etc/base/mstrsrv.cfg` file, normally `19990`. The frontend runs in `/mwizard/zen5/zstore-frontend`. Credentials are admin/zhilabs:

```
JDBC connection hostname (1)            localhost
JDBC connection port, default 1974 (1)  19990
JDBC connection frontend (1)            /mwizard/zen5/zstore-frontend
Console connection username (1)         admin
Console connection password (1)         *******
Confirm password (1)                    *******
```

Also it has to be configured every machine running the wizard. For the wizard the frontend is in `/mwizard/zen5/zstore-frontend`, on port `19740`. Credentials are admin/zhilabs.

In master-server is not used then it has to be configured every machine running the wizard. For the wizard the frontend is in `/mwizard/zen5/zstore-frontend`, on port `19740`. Credentials are admin/zhilabs.

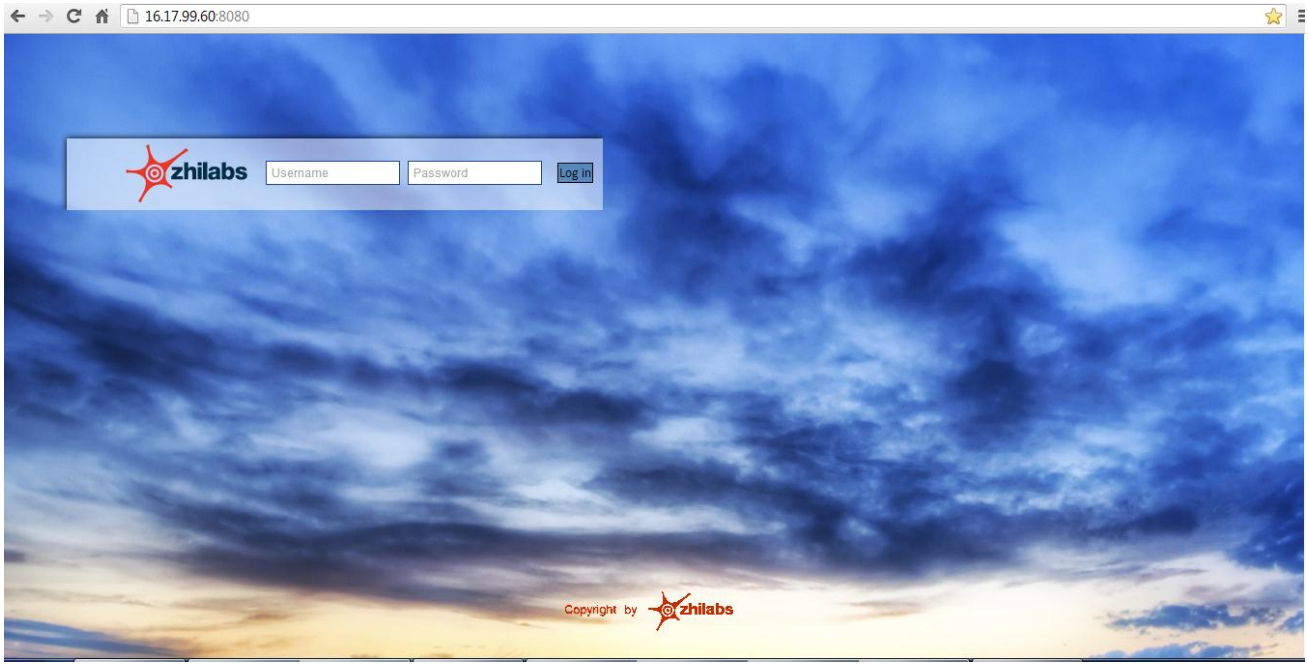
- On the second page check that the path of the installation points to `/opt/zl/nwi`.
- Check that the Google key is correctly configured: `/opt/zl/gui/google-maps.key`
- Check the persist-preferences switch if you want your preferences to remain between executions.
- Configure the Authentication. Possible options are `console` or `table`. If `console` is selected users and roles are defined in the `/opt/zl/nwi/etc/base/authentication.cfg` file.
  In our case "**`table`**" option should be selected.
  When setting "table" mode, it will be requested to change the password in the first connection. Only users with admin profile can do this. If new password is not set options in the menu bar will not be seen.
- Available permissions: Configure the permissions that can be assigned to the users in the Application. Possible values are:
  - gui-search-all: Enables search box.
  - gui-event-viewer: Enable access to event (-fact) tables.
  - gui-subscriber-all: Enables subscriber tables accessibility.
  - gui-reports-all: Enables report menu accessibility.
  - gui-report-definition-all: Enables wizard.
  - gui-formula-report-definition-all: Enables SDDT formula report creator.
  - gui-mgmt-all: Enables management screen.
  - gui-composer-all: Enables dashboard composer screen.
  - gui-formula-viewer-all: Enables report select-fields visibility.
  - gui-all-reports-viewer-all: Enables all reports visibility (including private ones).
  - gui-denominator-shared-viewer-all: Enables denominator and shared buttons in SDDT.
  - gui-pdf-cdf-viewer: Enables pdf and cdf functions.

Once all the parameters are entered pressing <ENTER> the application will save the configuration and will restart the tomcat in order the changes to take effect.

4.3.4 Testing HP CEA GUI (Application Servers only)

Once the system is fully installed and configured, HP CEA GUI can be accessed using a browser pointing to its configured URL, by default: **http://<GUI_host_ip>:8080**

In case of a correct installation the following screen should appear (picture may vary):



The default credentials to access FlowSight GUI are:

```
Username: admin
Password: zhilabs
```

4.4 RAID Configuration

The recommended methodology is to perform the write test and the read test simultaneously. The read test and the write test are described below. For each iteration it's necessary to write down each result when a parameter change, and perform systematic and continuous tests.

The result set in each iteration shall be written down. In some scenarios it's necessary to perform more than one iteration to achieve a local performance maximum.

Some of the configurable can be set from the bash shell, other parameters shall be set in the bios or in the ILO. One of the parameter can be set only during the disk formatting and is not possible to change.

- strip size: Unfortunately this parameter can be modified only during the disk formatting. There is no recommended value for it.
- RAID cache. It's a HW that shall be buy separately. It gives a throughput necessary in the most demanding scenarios. Recommended size of 1GB.
- BIOS settings
    - Power Management Power Optimized
    - Power Regulator Static High performance
    - Energy Performance Bias Max Performance
    - Collaborative Power Ctrl Disabled
    - Dimm Voltage Optimized for Performance
    - Memory Power Savin Max Performance
    - 1300 MHz supp enabled .
- Kernel settings
    - blockdev --setra 65536 /dev/sdb
    - echo 512 > /sys/block/sdb/queue/nr_requests
    - vm.dirty_background_ratio = 5
    - echo noop > /sys/block/sdb/queue/scheduler
    - vm.swappiness = 1
    - vm.dirty_ratio = 5
    - vm.overcommit_ratio = 50

4.4.1 Kernel settings, Parameters to tune

4.4.1.1 swappiness

The swappiness is a sysctl parameter that defines when the swap will take place. The lower the value, the more the kernel will wait to send a process memory to the swap area. Recommended value for this is to put a low value like 0 or 1

This value shall be set in /etc/sysctl.conf and be loaded with sysctl -p

vm.swappiness = 1

4.4.1.2 vm.dirty_background_ratio and vm.dirty_ratio

The dirty_ratio are sysctl parameters that define when modified memory page will be updated into disk. The lower the value, the more the kernel will wait to sync the memory. Recommended value for this is to put a low value like 5. Lower values than 5 had an adverse effect. (Quite minimal and maybe this effect is due to the experiment noise).

This value shall be set in /etc/sysctl.conf and be loaded with sysctl -p

vm.dirty_ratio = 5

vm.dirty_background_ratio = 5

4.4.1.3 vm.overcommit_ratio

This value shall be set in /etc/sysctl.conf and be loaded with sysctl -p

```
vm.overcommit_ratio = 50
```

4.4.1.4 read ahead

The read ahead set how many blocks the system shall read. This parameter can be set with a command or writing to the sys file system. The effect is not the same and the blockdev offer better results for the same value. It's clear the blockdev command do something more under the hood.

This parameter is set from the shell as user root.

```
blockdev --setra 65536 /dev/sd
```

4.4.1.5 nr_requestst

This parameter defines the queue number of request

This parameter is set from the shell as user root.

```
echo 512 > /sys/block/sdb/queue/nr_requests
```

4.4.1.6 scheduler

The scheduler defines the strategies to send the data blocks to disk. The ARRAY in O2 Germany has an attached cache memory of 1Gbyte. In this scenario is best to don't define a strategy at kernel level and let the raid define the best strategy based on its internal state.

```
echo noop > /sys/block/sdb/queue/scheduler
```

4.4.1.7 Enable Direct Write

First of all, install the tool hpacucli to see the hardware configuration. If the parameter "Drive Write Cache" is disabled, execute the next 2 commands:

- # hpacucli ctrl slot=1 show detail
- # hpacucli ctrl slot=1 logicaldrive 1 show

4.4.2 Make changes permanent

In order to make changes permanent, following files shall be modified.

- Grub
- Sysctl
- Start up scripts

4.4.3 Testing

4.4.3.1 Testing read speed

The read speed can be tested directly with the command hpparm. The test option will give an approach of the read speed, take into account there can be estrange effects due to raid cache. A good practice is to run the command a few times and do an average.

```
hdparm -tT /dev/sda5

/dev/sda5:

Timing cached reads:   19420 MB in  2.00 seconds = 9721.44 MB/sec

Timing buffered disk reads:  396 MB in  3.00 seconds = 131.98 MB/sec

MUN1BKP1-app:~ # hdparm -tT /dev/sdb1

/dev/sdb1:
```

Timing cached reads: 19416 MB in 2.00 seconds = 9717.32 MB/sec

Timing buffered disk reads: 1842 MB in 3.00 seconds = 613.40 MB/sec

4.4.3.2 Testing write speed

The write speed can be test using the dd command. Note that due to raid optimization and the "strip" size the result are different for different block sizes. The best results are those that have a block size similar to the strip size.

The raid cache plays an important role in this case, so it's best to run with total transfer sizes higher than the cache size, otherwise the test will be measuring the write speed to memory not the write speed to disk.

Following command runs the same command.

dd if=/dev/zero of=/opt/zl/output.img bs=8k count=256k

dd if=/dev/zero of=/opt/zl/output.img bs=4k count=256k

dd if=/dev/zero of=/opt/zl/output.img bs=2k count=256k

4.5 Code Signing

This Software Product from HP is digitally signed and accompanied by Gnu Privacy Guard (GnuPG) key.

On SUSE Linux platform

Below mentioned procedure* allows you to assess the integrity of the delivered Product before installing it, by verifying the signature of the software packages.

Pick the signature (.sig) file shipped along with the product and use following GPG command

gpg --verify <product.sig> <product>
Example: gpg --verify VPNSVP-X51-3A.zip.sig VPNSVP-X51-3A.zip

Note: Look for the comments shown below in the command output
Good signature from "Hewlett-Packard Company (HP Code signing Service)"

==========

Note: If you are not familiar with signature verification using GPG and intended to verify HP Product signature, follow the steps given below.

1. Check whether gnupg gpg is installed on the system. If no, install gnupg gpg

2. Configure GPG for accepting HP signature. The steps are the following:
   a. Log as root on your system
   b. Get the hpPublicKey from following location:
      https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=HPLinuxCodeSigning
      and save it as hpPublicKey.pub
      Note that the hpPublicKey file will be located in the root's home directory.
   c. Follow the instruction found at above URL in the "Verification using GPG" section.

**HP strongly recommends using signature verification on its products, but there is no obligation. Customers will have the choice of running this verification or not as per their IT Policies.*

5 Reference-files

The following command shows reference comma separated files used by HP CEA:

```
ls -la /opt/zl/nwi/var | grep .csv
```

These files are located under `/opt/zl/{server}/var`.

There are two different types of this csv files:

- Product reference files:

  They are part of the HP CEA application and do not need to be updated frequently. These files are used to complete the information shown at HP CEA website.

- Client reference files

  They are updated by the client (Operator). These files store information related to the network devices and other useful information about the client.

  To update these files, the client must upload them to the following path of the target machine and open a request to HP Support CEA team:

```
/home/operator/interchange
```

When client files are available on previous path, there is a script running periodically that process client files and validate them. Once the validation is correct, client files are copied to all mediation servers.

5.1 Decoration elements

This section is aimed at providing a detailed description of the external data sources to be provided for HP CEA 4.5 in order to properly decorate the information coming from the network.

Figure 1 depicts the different decoration element families to be provided:

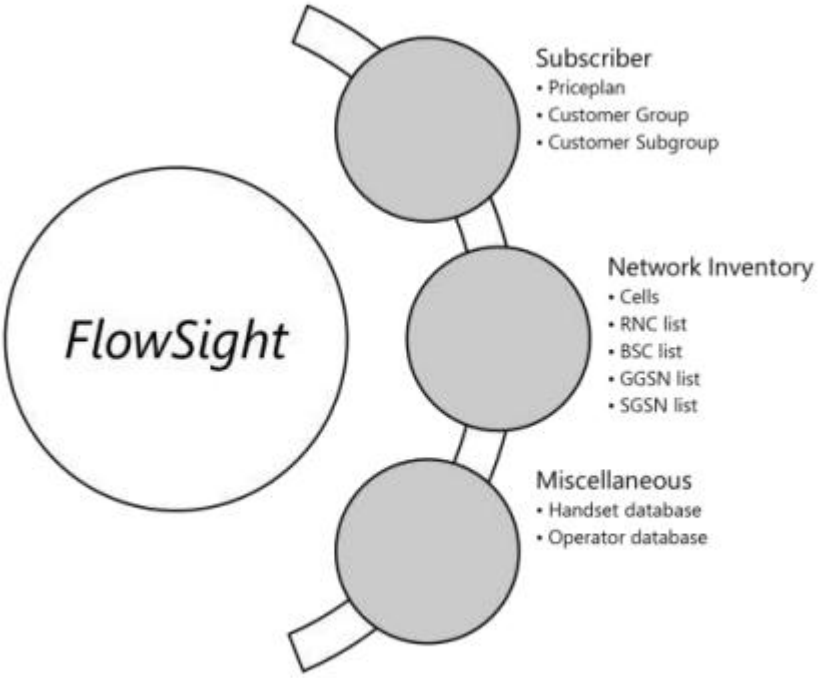


Figure 1. Decoration Elements.

1. Subscriber information. This information is mandatory and must be provided for customer segmentation.

2. Network Inventory. This information is mandatory. It provides mappings of cells to names, IP addresses to node names and valid country prefixes.

3. Miscellaneous. The information in this section is not mandatory as it is provided as a bundle in HP CEA. However, the Operator may decide to use other databases for handsets and roaming Operators worldwide. Setting these data sources is outside the scope of this document.

5.1.1 Format

All files will be provided strictly following the requirements below:

1. CSV files.
   a. Separated by semicolons.
   b. Containing a header denoting the name of each of the fields.
   c. The number and order of the fields must be the ones specified in each section of this document.
   d. Empty fields are allowed as long as they are not mandatory.

2. Text file encoding must be UTF-8. Otherwise Unicode characters may come up as weird strings in the graphical user interface.

3. Floating point numbers must be represented with the dot as separator between the decimal and the integer parts.

5.1.2 File locations

All decoration files shall be distributed to all mediation servers and located in their corresponding locations. They are all specified in the following sections. For the rest of the document, consider the following environment variable as defined. If it is not defined yet, it must be set:

```
FS_DECORATION_ROOT=/opt/zl/nwi/var/decoration
```

Please note that this directory is not created during the installation of HP CEA, so it has to be created manually with the following command:

```
mkdir /opt/zl/nwi/var/decoration
```

5.2 Subscriber information

The information provided on a subscriber basis consists mainly of the subscriber's price plan and two additional fields which may provide additional segmentation capabilities (group and subgroup).

5.2.1 Subscriber decoration file

The file is located in the following path.

```
$FS_DECORATION_ROOT/subscriber-groups.csv
```

5.3 Network inventory

The information related to network inventory contains mainly:

1. Cell inventory. Provides information for each LAC-SAC/CI and its related information:
    a) MCC-MNC. Operator Mobile Country Code and Mobile Network Code.
    b) Geographical information. Azimuth and geo-location coordinates.
    c) Geopolitical information:
        i) Region.
        ii) City.
    d) Associated controller. RNC or BSC.
    e) Technology. 2G or 3G.
    f) Region.
2. Node names. Provides mappings of IP addresses into descriptive human names.

5.3.1 Cell decoration file

The file is located in the following path:

```
$FS_DECORATION_ROOT/cells.csv
```

5.3.2 Node decoration file

The file is located in the following path:

```
$FS_DECORATION_ROOT/nodes.csv
```

6 Changing for HP logos

Untar at “/root” location the file Logos4_5.tar taken from the “Binaries” directory of HP CEA 4.5 Media or kit.

Execute custo.sh, restart Tomcat and HP CEA. HP logos will take place in the GUI.

After new configuration using setup-gui command, this operation should be executed to keep the HP logos.

7 Installing *Ganglia* software

Together with HP CEA, Ganglia monitoring software can be[1] installed. Ganglia is a distributed system monitor tool for high-performance computing systems such as clusters and grids. It allows the user to remotely view live or historical statistics (such as CPU load averages or network utilization) for all machines that are being monitored.

In this point it is covered the installation of Ganglia application. It is assumed that the system has been properly installed and configured according to the previous instructions.

All the rpms must be installed as root user.

In the Ganglia GUI machine there must be installed the processes apache2, gmond and gmetad. In the other servers, the only process to be installed is gmond.

We must install the following dependencies before installing ganglia gmond:

```
# zypper install libconfuse0-2.7-2.1.x86_64.rpm
# zypper install libganglia-3_1_0-3.1.2-zl_2.x86_64.rpm
```

Installing Ganglia gmond:

```
# zypper install ganglia-gmond-3.1.2-zl_2.x86_64.rpm
# zypper install ganglia-gmond-modules-python-3.1.2-zl_2.x86_64.rpm
```

In other to install gmetad process we must install before its dependency:

```
# zypper install rrdtool-1.3.6-3.1.x86_64.rpm
```

```
# zypper install ganglia-gmetad-3.1.2-zl_2.x86_64.rpm
```

Before installing the web application rpms, we must first install its dependencies:

```
# zypper install libmm14-1.4.2-92.1.x86_64.rpm
# zypper install php5-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-json-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-tokenizer-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-suhosin-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-dom-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-xmlreader-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-xmlwriter-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-gd-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-iconv-5.2.6-50.24.1.x86_64.rpm
# zypper install php5-hash-5.2.6-50.24.1.x86_64.rpm
```

```
# zypper install ganglia-web-3.1.2-zl_2.noarch.rpm
```

[1] Ganglia is not part of deployment of HP CEA Software. It is useful for monitoring the solution, but the installation and use of Ganglia is responsibility of the customer

```
# zypper install ganglia-zhilabs-template-3.1.2.1-zl_3.noarch.rpm
```

If apache2 is not installed in the server, we must install it:

```
# zypper install libapr-util1-1.3.4-12.20.2.x86_64.rpm
# zypper install apache2-utils-2.2.10-2.24.5.x86_64.rpm
# zypper install apache2-prefork-2.2.10-2.24.5.x86_64.rpm
# zypper install apache2-2.2.10-2.24.5.x86_64.rpm
# zypper install apache2-mod_php5-5.2.6-50.24.1.x86_64.rpm
```

7.1.1 Monitoring Daemon Configuration (Common to all machines in the cluster)

The following lines depict the process of configuring each machine in the cluster to allow Ganglia monitoring. It is assumed that one Application Server will be used as the centralized node for monitoring; this machine will be referred as Central Monitoring Node.

Every machine in the cluster needs to have the monitoring daemon configured. To do that:

1. Open the monitoring daemon configuration file: in a terminal, enter the following command

```
# vim /etc/ganglia/gmond.conf
```

2. Edit cluster information: the URL needs to match the application server where the gmetad daemon is running:

```
cluster {
  name = "cluster"
  owner = "Zhilabs SL"
  latlong = "unspecified"
  url = "http://applicationserver/ganglia"
}
```

4. Edit udp_send_channel information: the host information should point to the Application Server in charge of centralized monitoring. This can be done by using a name if possible, or the IP address can be specified too. Make sure that TTL value is enough for the network in which the system is being deployed.

```
udp_send_channel {
  host = applicationserver
  port = 8650
  ttl = 64
}
```

7.1.2 Collection Configuration (Central Monitoring Node only)

To configure the collection of the information provided by all the machines in the cluster, the following procedure must be completed:

1. Open the collection daemon configuration file: in a terminal, enter the following command

```
# vim /etc/ganglia/gmetad.conf
```

2. Configure the available data sources. In the sample configuration depicted above, assuming that every machine's cluster is named "mycluster", the following line should be added to gmetad.conf:

```
data_source "mycluster" localhost
```

3. In order to allow ganglia to show the name of each machine, make sure that all of them are properly covered in /etc/hosts. Otherwise, the machines in the cluster will be named according to their IP address.

```
gridname "name of de grid"
```

7.1.3 Starting Processes

It is necessary to start gmond process in all the servers.

```
# /etc/init.d/gmond start

/etc/init.d/gmond start
/etc/init.d/gmond stop
/etc/init.d/gmond restart
```

It is necessary to start gmetad process in the gui server.

```
# /etc/init.d/gmetad start

/etc/init.d/gmetad start
/etc/init.d/gmetad stop
/etc/init.d/gmetad restart
```

It is necessary to start apache2 process in the gui server.

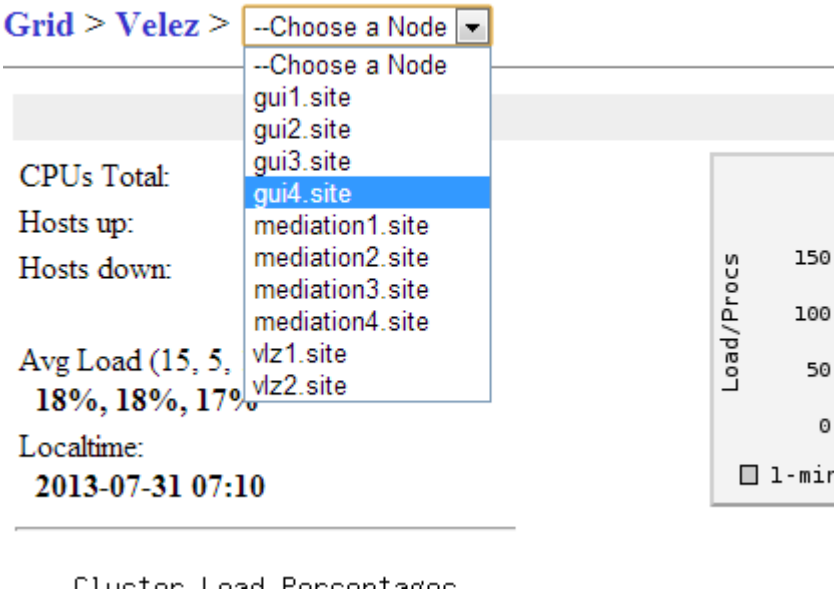
```
# /etc/init.d/apache2 start

/etc/init.d/apache2 start
/etc/init.d/apache2 stop
/etc/init.d/apache2 restart
```

7.1.4 Testing Ganglia GUI

Once the system is fully installed and configured, Ganglia GUI can be accessed using a browser pointing to its configured URL, by default: **http://<GUI_host_ip>:80/ganglia**

In case of a correct installation the following screen should appear (picture may vary):

Ganglia uses the names of the hosts from the file /etc/hosts. In order to change the name appearing in the application, it is necessary to review and modify the file /etc/hosts in each of the server to change the name of the host.



8 Alarm system configuration

Alarm system must be configured, if applicable in the gui server. This system sends traps to a central machine in order to alert if there are any controlled parameter with a failure.

8.1.1 Configuring Alarm System

It has to be configured two parts for the alarm system; cront and snmp.

A new file must be created on /etc/cron.d folder, named crontab_platforms_alarm.[hostname], containing the information of the servers that send traps to our central server (gui server, typically), and the execution of the snmp command that send the traps to the central node. Will look like this:

```
#SNMP Probe interfaces monitor
5 * * * * root [ `hostname` = gui1 ] && /opt/zl/nwi/bin/zenhealth --output
/opt/zl/nwi/var/traps/zen-snmp.dat --output-format snmp --base /opt/zl/probe sis1.pe lav1.pe


#SNMP Monitor zenhealth
5 * * * * root [ `hostname` = gui1 ] && /opt/zl/nwi/bin/zenhealth --output
/opt/zl/nwi/var/traps/zen-snmp.dat --output-format snmp mediation1 mediation2 gui1
5 * * * * root [ `hostname` = gui1 ] && /opt/zl/nwi/bin/snmptrap
```

Also it must be checked that the zenhealth configuration sends the traps info to an Apache webapp, accessible in http://gui:80/zenhealth. This is configured also in crontab, in a file named zenhealth.html:

```
  # Flowsight SNMP Monitor zenhealth
  0 0-23/4 * * *  zhilabs  [ -w /srv/www/htdocs/zenhealth/ ] &&  /opt/zl/nwi/bin/zenhealth --
output /srv/www/htdocs/zenhealth/index.html --output-format html gui1.pe mediation1.pe
mediation2.pe >>/tmp/zenhealth.html.log 2>&1
```

Now, it is configured the url and protocol of the Operator central node that will receive the traps. This will be added in /opt/zl/nwi/etc/base/snmp.cfg file. It must be checked that there are not more files with snmp configuration like snmptrapsender.cfg:

```
snmp-trap peru
    snmp-uri      snmp://v1v2Config@10.10.79.71:162/2c
!
```

Where the IP is the central Operator node and 2c/1c is the protocol of the snmp. Tipically is 2c.

With this two steps system is able to send traps to the central node, always from the gui machine, who centralize all the process

8.1.2 Testing Alarm System

Alarm system can be tested manually by sending alarms created manually. For this, it is executed the next commands:

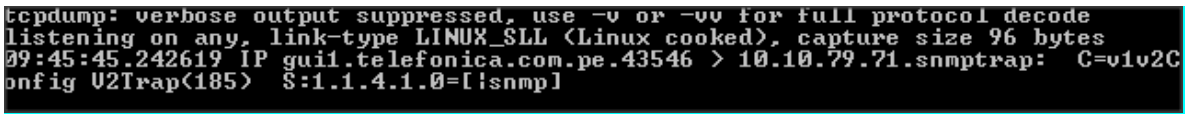
```
      # /opt/zl/nwi/bin/zenalarms set alarm zenMemory equipmentAlarm thresholdCrossed
warning "TEST_alarm1"
      # /opt/zl/nwi/bin/zenalarms set alarm zenDisk equipmentAlarm thresholdCrossed
warning "TEST_alarm2"
      # /opt/zl/nwi/bin/snmptrap
```

The last snmptrap command sends the traps generated; before it, it can be checked those traps in the /opt/zl/nwi/var/traps/ folder.

Meanwhile, it can be checked if they are sent by monitoring the UDP and TCP port, following the next instruction:

```
sudo /usr/sbin/tcpdump -i any -f "udp and port 162"
```

In the above image it is shown how the alarms are sent by this port:



Now it is necessary to wait for the operator's confirmation about receiving the traps on their machine.

Appendix A – Software repositories

Once the operating system has been installed, it is mandatory to add all the necessary installation media as local Yast software repositories. For added convenience, it is necessary to create ISO images of the physical installation media if the ISO has not been created previously, and use those ISO images as software repositories.

Also the default repository created by SLES installation can be deleted. Run the following command as root to delete SLES's standard repository:

```
# zypper removerepo N (N--> Repository number):
# zypper lr:
#  |  Alias                                                                    |  Name
--+-------------------------------------------------+-----------------------------------
1 | SUSE-Linux-Enterprise-Server-11-SP1_11.1.1-1.152 | SUSE-Linux-Enterprise-Server-11-SP1
```

Regardless of the HP CEA installation type, the `SLES-11-SP2-DVD-x86_64-GM-DVD1.iso` should be added as Yast repositories.

Adding a repository using Yast

The procedure to add a repository using Yast is the following:

1. Execute the yast command.
2. Use the Software/Software Repositories to add the repositories:

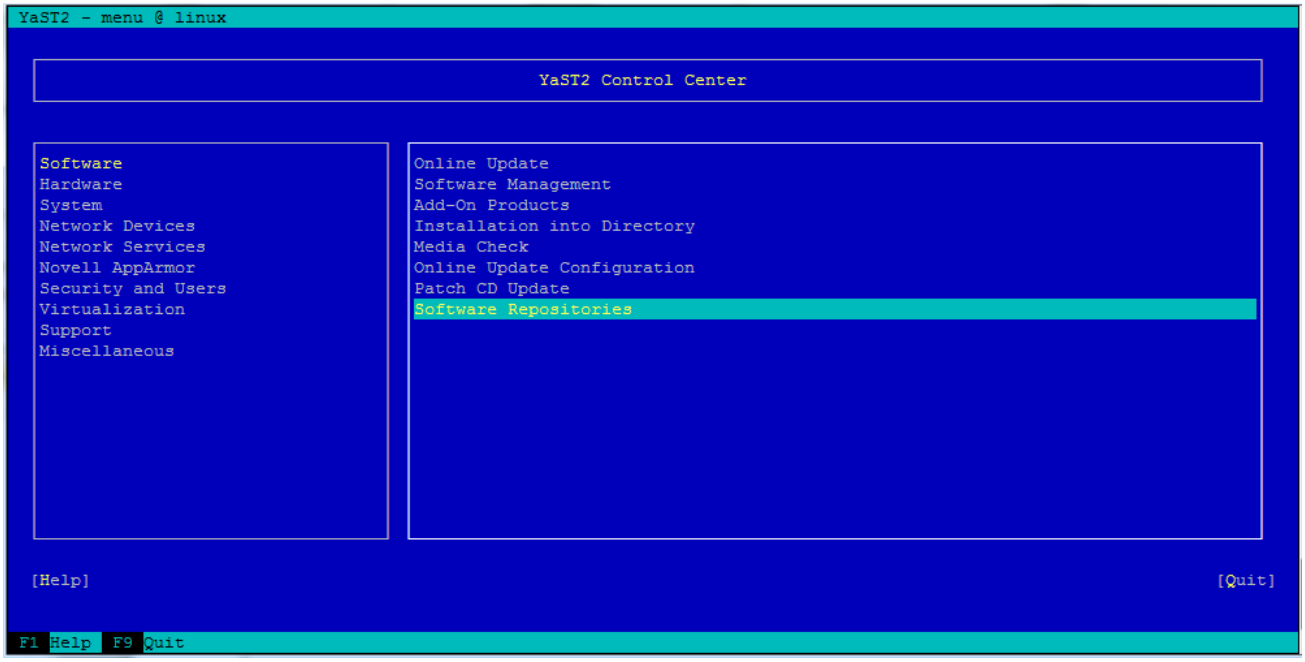
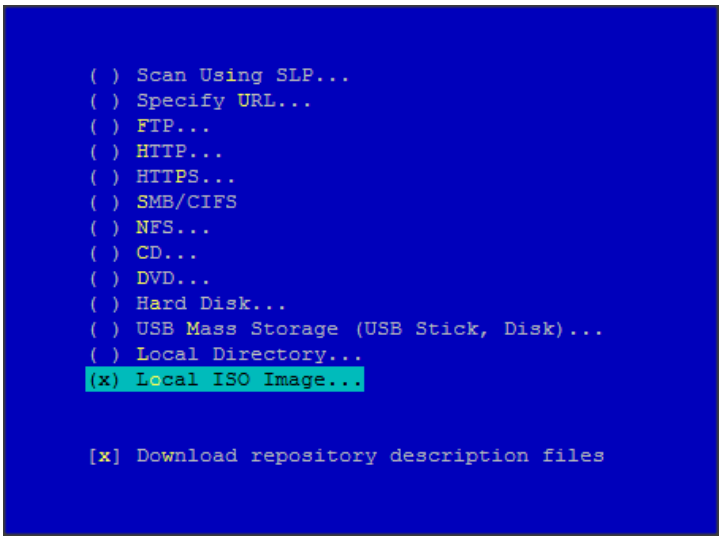
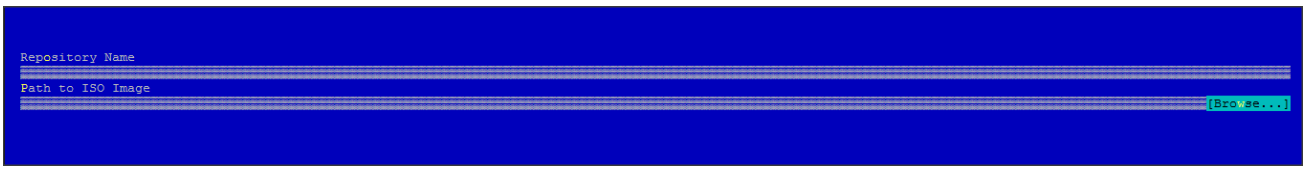


Figure 1 – Yast- Software Repositories screen.

1) Press [*Alt + A*] to **Add** a new Repository
2) Mark the option "*Local ISO Image…*".

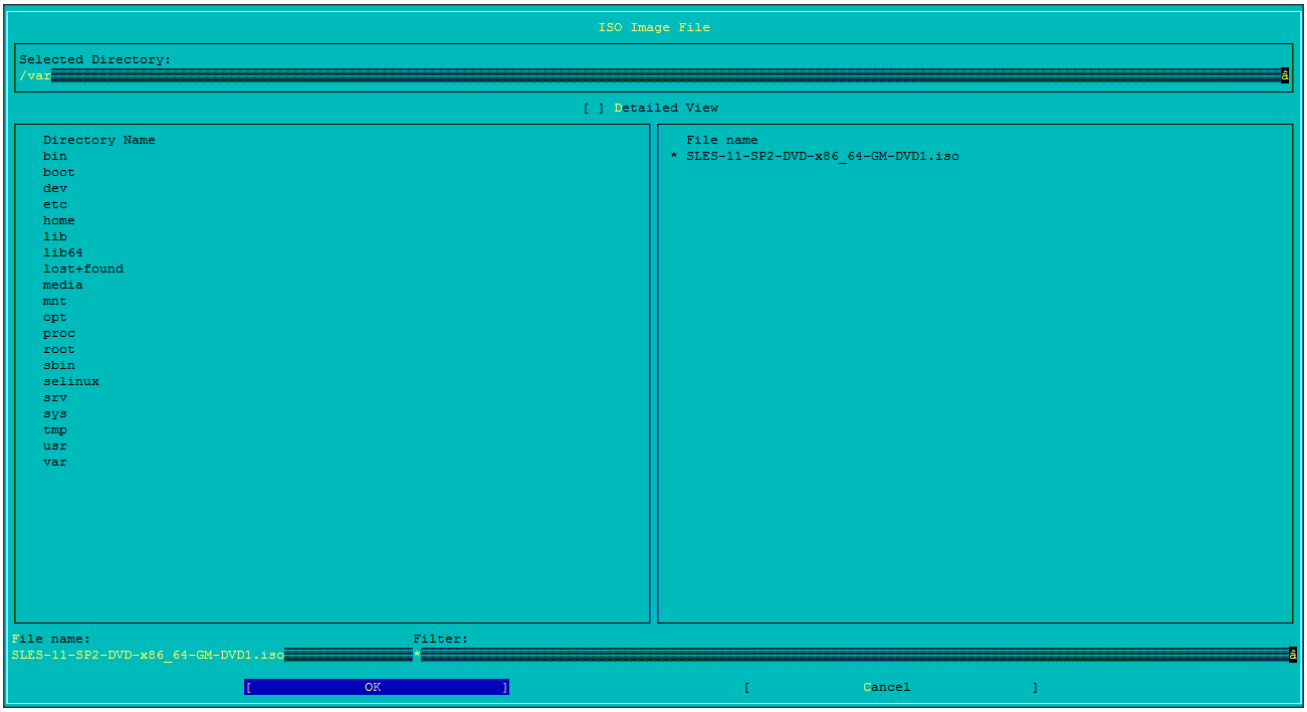


3) Press [*Alt+x*] for **Next** step
4) Press [*Alt+w*] for **Browsing** the location of the iso file.

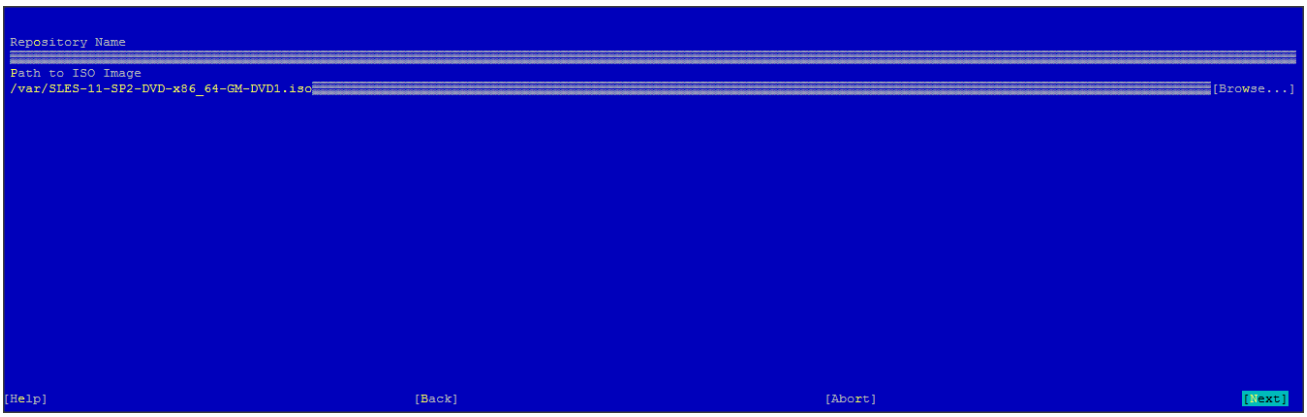


5) Search the path and select the corresponding iso file:

```
SLES-11-SP2-DVD-x86_64-GM-DVD1.iso
```



6) Press [*Alt + O*] to confirm the file **OK**



7) Press [*Alt+N*] for **Next** step

8) Press [*Alt + O*] to confirm the repository **OK**
9) Press [*Alt + Q*] to exit *yast* menu **Quit**

Once all the repositories have been added it is possible to check the result. The following command lists all the configured repositories:

```
# zypper lr
```

Adding a repository from an optical drive

Assuming the server's optical drive is seen as `/dev/cdrom` by the operating system (Actual value should be used):

SLES11 SP1 DVD :

Insert the SLES 11 SP1 x86_64 DVD 1 in the server's optical unit and run the following commands as root:

```
# mkdir /srv/repo
# dd if=/dev/cdrom of=/srv/repo/SLES_11_SP1_DVD1.iso
5930304+0 records in
5930304+0 records out
3036315648 bytes (3.0 GB) copied, 445.916 s, 6.8 MB/s
######### modprobe loop
######### mount -o loop /srv/repo/SLES_11_SP1_DVD1.iso /mnt/
# zypper addrepo -c -t yast2 "iso:/?iso=/srv/repo/SLES_11_SP1_DVD1.iso" "SLES_11_SP1_DVD1"
```

Application Servers:

On application servers only, the SLES 11 SDK1 DVD 1 needs to be added as a repository in addition to the other sources. Follow these instructions:

1. Insert the SLES 11 SDK1 DVD 1 in the optical drive and enter the following commands as root:

```
# dd if=/dev/cdrom of=/srv/repo/SLES_11_SDK_DVD1.iso
…
# zypper addrepo -c -t yast2 "iso:/?iso=/srv/repo/SLES_11_SDK_DVD1.iso" "SLES_11_SDK_DVD1"
```

After all the repositories have been added, refresh them with the following command (please answer “yes” to any question that asks you to accept an unsigned repository):

```
# zypper refresh
```

Appendix B – Introduction to the concept of hugepage

The greater the amount of RAM available, the server's overall performance should be higher. However on servers with large amounts of RAM may be the paradox that the performance decreases as the amount of RAM increases could even reached to the point that the processes must wait indefinitely until the kernel assigns RAM.

How can a server with many gigs of RAM have worse performance than one with fewer gigs of RAM? Because the larger the RAM memory is, more pages should be cached. For example, a server with 12GiB of RAM with the default page size (4KiB) would have a page table with 3,145,728 pages. Hugepages allows larger pages, 2MiB default on Linux x86_64 and x86-PAE, and 4MiB on Linux x86. Thus, for example, a Linux x86_64 hugepages 12GiB of RAM and paging would have a table with only 6,144 pages.

Hugepages therefore allows paging smaller tables and less use of CPU cycles on the management of memory pages. This results in an increase in server performance.

The way to book hugepages to use Intel DPDK allocation is to hugepages at boot. To book hugepages at boot is necessary to pass the following parameter to the kernel line (menu.lst file).

Adding only the following parameter: hugepage = 1024, it would be reserving 1024 2MB pages (default). If we want a different size eg 1G pages, then it should explicitly specify the size and also specify the default size for the system. For Intel and dpdk probes will configure the following:

```
hugepagesz default_hugepagesz = 1G = 1G hugepages = 4
```

Appendix C – Introduction to the grub menu file: menu.lst

This file specifies which system starts when booting the pc (it may be more than one operating system). The modification of this file has to be done with root. Normally in this file are different options on how to boot the operating system, such as:

- Start in normal mode.
- Start in recovery mode.
- Start mode memory test.

When configuring each boot option must specify the following parameters:

- title: boot name for this mode will appear in the Grub menu.
- root: (hard drive, partition) where the system is installed.
- kernel: this option has various parameters. It is explained some kernel option settings to get an idea.

- It is needed to know the number of kernels. To know the number of kernels: type in terminal:

```
uname-r
```

Once we know the number of kernels it is possible to configure the system. The first part of the command would be as follows:

```
kernel / vmlinuz-<number_of_kernel>
```

If the number of kernel we have obtained with the above command is 2.6.32.12-0.7-default, then it would be as follows:

```
kernel / vmlinuz-2.6.32.12-0.7-default
```

- It is needed to know the partition UUID (unique identification label partition) on which operating system is installed. For this value you type in the following command:

```
ls-l /dev/disk/by-uuid/
```

Although in our probes files really it is taken the output of the command

```
ls-l /dev/disk/by-id/
```

So the result must be the same with both commands. It would be chosen the number shown on the partition where the system is installed. Eg:

```
lav1:/boot/grub # ls -l /dev/disk/by-id/
total 0
lrwxrwxrwx 1 root root 16 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0 ->
../../cciss/c0d0
```

```
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part1 -
> ../../cciss/c0d0p1
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part2 -
> ../../cciss/c0d0p2
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part3 -
> ../../cciss/c0d0p3
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part4 -
> ../../cciss/c0d0p4
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part5 -
> ../../cciss/c0d0p5
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part6 -
> ../../cciss/c0d0p6
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001cab930436e66475d330a0-part7 -
> ../../cciss/c0d0p7
lrwxrwxrwx 1 root root 16 2013-01-16 00:06 cciss-3600508b1001ce973667f625a3cb8bb38 ->
../../cciss/c0d1
lrwxrwxrwx 1 root root 18 2013-01-16 00:06 cciss-3600508b1001ce973667f625a3cb8bb38-part1 -
> ../../cciss/c0d1p1
```

Parameter should therefore be as follows:

```
root = /dev/disk/by-id/cciss-3600508b1001cab930436e66475d330a0-part2
```

- file_caps = 1: informs Linux kernel that it should enable the filesystem options at boot time.

- initdr: in this parameter it must be filled

```
/initrd-<number of kernel>
```

With the number it has been obtained above it is get the following:

```
/initrd/initrd-2.6.32.12-0.7-default
```

Other important options of this menu file "menu.lst" are:

- default 0: Indicates that the default to load is the 1st option that appears in the Grub menu (if it is wanted the default to be the 2nd option, it would be written default 1).

- timeout: indicates the time that Grub will wait before starting the default (if you do not press any keys).

Appendix D – Troubleshooting

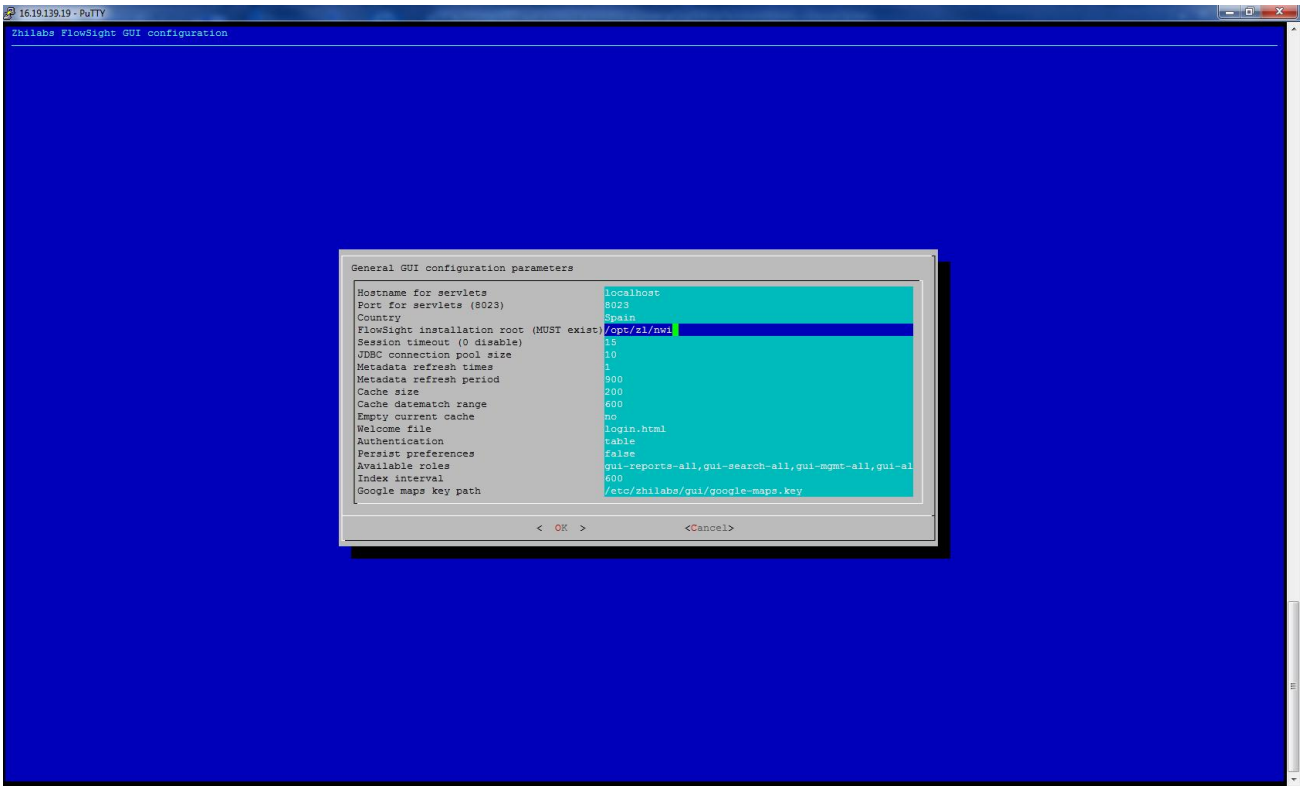
Google API key

When launching HP CEA GUI an error can be displayed because of the Google Api Key, it will be an alert like this:

In order to resolve this, there is information in the web.xml file of GUI, located at /etc/zhilabs/gui/WEB-INF/web.xml and the google api key path definition:

```
<servlet>
  <servlet-name>getgooglemaps</servlet-name>
  <servlet-class>com.zhilabs.webgui.server.misc.GoogleMapsHelperImpl</servlet-class>
  <init-param>
    <param-name>maps-key-path</param-name>
    <param-value>/etc/zhilabs/gui/google-maps.key</param-value>
  </init-param>
  <load-on-startup>1</load-on-startup>
</servlet>
```

This path was defined into the gui-setup assistant, in the second screen



The google-maps.key must be included in this folder. Having a Google account, it can be generated a new Google Maps API browser Key v2 (despite it is deprecated and must use v3) in the Google API Console. It is generated the key for our server IP.

If it is generated an invalid key, the application will show an advertisement at startup

GUI Tomcat errors

For any GUI error related to Tomcat Server, it can be consulted the Catalina and HP CEA log files located in /usr/shared/tomcat6/logs. Here there are all the log files related to the application server.

WEB.XML

Maybe there can be problems while writing to web.xml with the setup_gui application, caused by server encoding

```
<param-name>db-url</param-name>
<param-value>jdbc:zstore://Ã¿localhost:1974//m0/zen5/zstore-frontend</param-value></init-param>
```

Jdbc console does not start

When starting /opt/zl/{server}/bin/jdbcnsl the following java error is shown:

```
zhilabs@nwi4:/opt/zl/nwi/bin> ./jdbcnsl
Exception in thread "main" java.lang.NoClassDefFoundError: com/zhilabs/jdbc/console/C
onsole
Caused by: java.lang.ClassNotFoundException: com.zhilabs.jdbc.console.Console
        at java.net.URLClassLoader$1.run(URLClassLoader.java:217)
        at java.security.AccessController.doPrivileged(Native Method)
        at java.net.URLClassLoader.findClass(URLClassLoader.java:205)
        at java.lang.ClassLoader.loadClass(ClassLoader.java:321)
        at sun.misc.Launcher$AppClassLoader.loadClass(Launcher.java:294)
        at java.lang.ClassLoader.loadClass(ClassLoader.java:266)
Could not find the main class: com.zhilabs.jdbc.console.Console. Program will exit.
```

It is caused because Jdbcnsl needs set the environment variable ZE_ROOT to the current HP CEA installation path.

Solution:

To solve this ZE_ROOT variable must be defined. It could be through CLI:

> export ZE_ROOT=/opt/zl/nwi

Server performance

It is detected in laboratory servers a descent in the performance; some zen process can take all the resources, consuming all the memory or CPU.

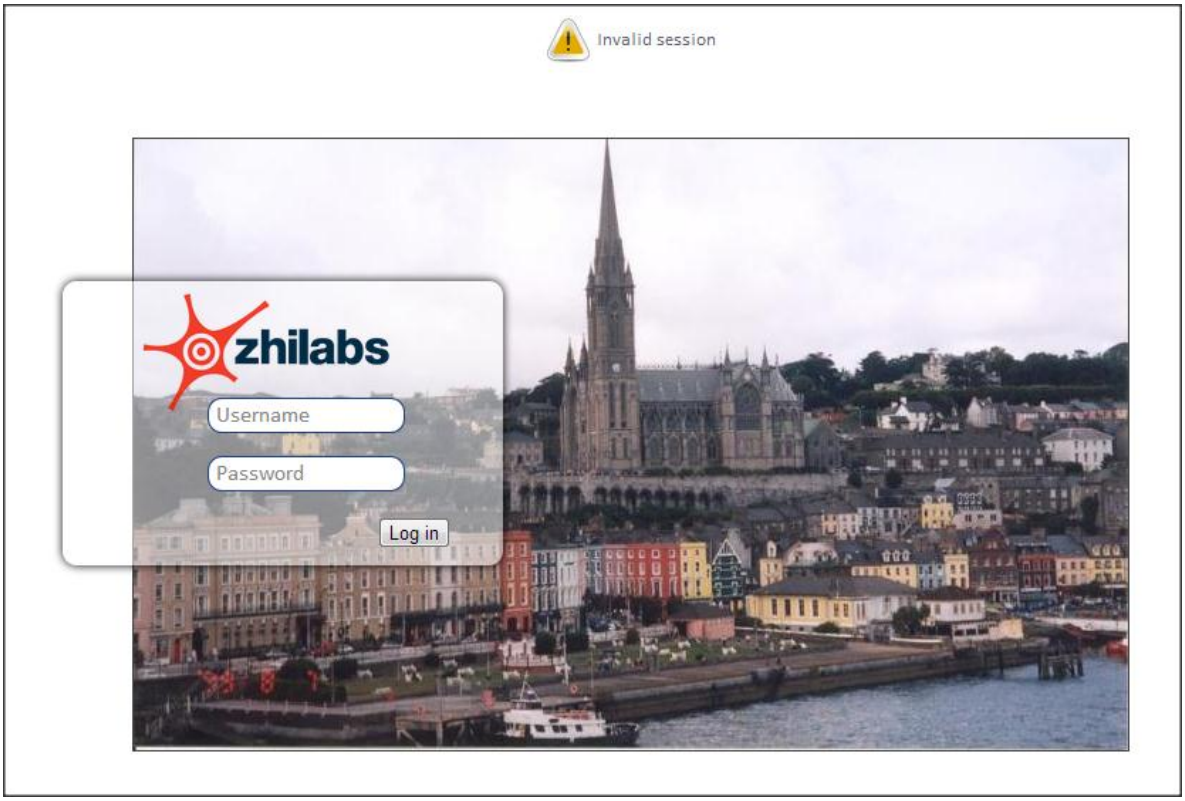
Those processes can be stopped manually by renaming the config files (*.cfg), located at /opt/zl/nwi/etc/base, and restarting zen-nwi service.

```
-rw-r--r-- 1 zhilabs zhilabs  12655 2013-02-11 10:04 gn_app.cfg
-rw-r--r-- 1 zhilabs zhilabs  11710 2013-02-08 16:44 gn-kpi.cfg
-rw-r--r-- 1 zhilabs zhilabs 138442 2013-02-08 16:44 gn_pdu_browsing-kpi.cfg-bak
-rw-r--r-- 1 zhilabs zhilabs  18917 2013-02-08 16:44 gn_pdu_dns-kpi.cfg-bak
-rw-r--r-- 1 zhilabs zhilabs  90904 2013-02-08 16:44 gn_pdu_email-kpi.cfg-bak
-rw-r--r-- 1 zhilabs zhilabs  90669 2013-02-08 16:44 gn_pdu_file_sharing-kpi.cfg-bak
-rw-r--r-- 1 zhilabs zhilabs  80686 2013-02-08 16:44 gn_pdu_streaming-kpi.cfg-bak
-rw-r--r-- 1 zhilabs zhilabs  37112 2013-02-08 16:44 gn_session-kpi.cfg-bak
-rw-r--r-- 1 zhilabs zhilabs  60467 2013-03-01 14:19 gn_signaling-kpi.cfg
-rw-r--r-- 1 zhilabs zhilabs   8989 2013-02-08 16:44 gn_subscriber.cfg
-rw-r--r-- 1 zhilabs zhilabs   6841 2013-02-08 16:44 gn_subscriber_vips.cfg-bak
```

It is necessary to be especially careful with gn_subscriber.cfg file, because if it is stopped this the zen services will not start. Also, there are dependencies between collectors, and stopping one may cause bad functionality of another not relevant.

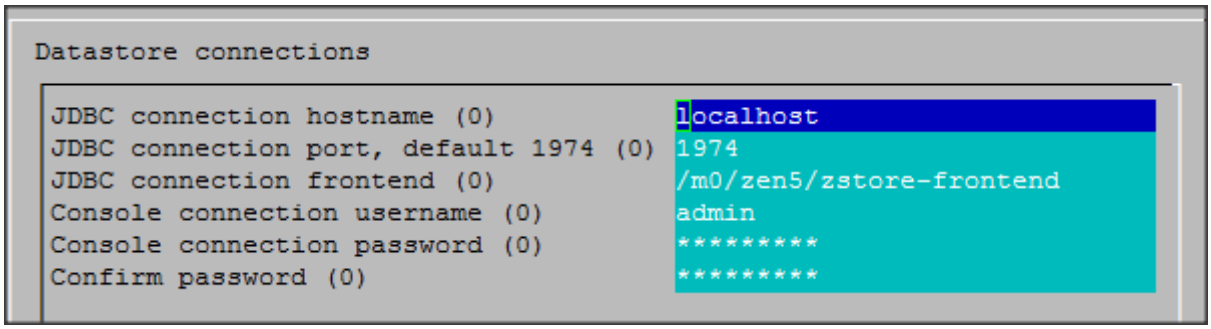
Invalid Session

If we are attempting to login in the application and it is shown an “Invalid session” error, like this:



There are two kind of incidents related with this message, log files /var/log/warn and /var/log/tomcat6/app.log must be read to determine which is the problem:

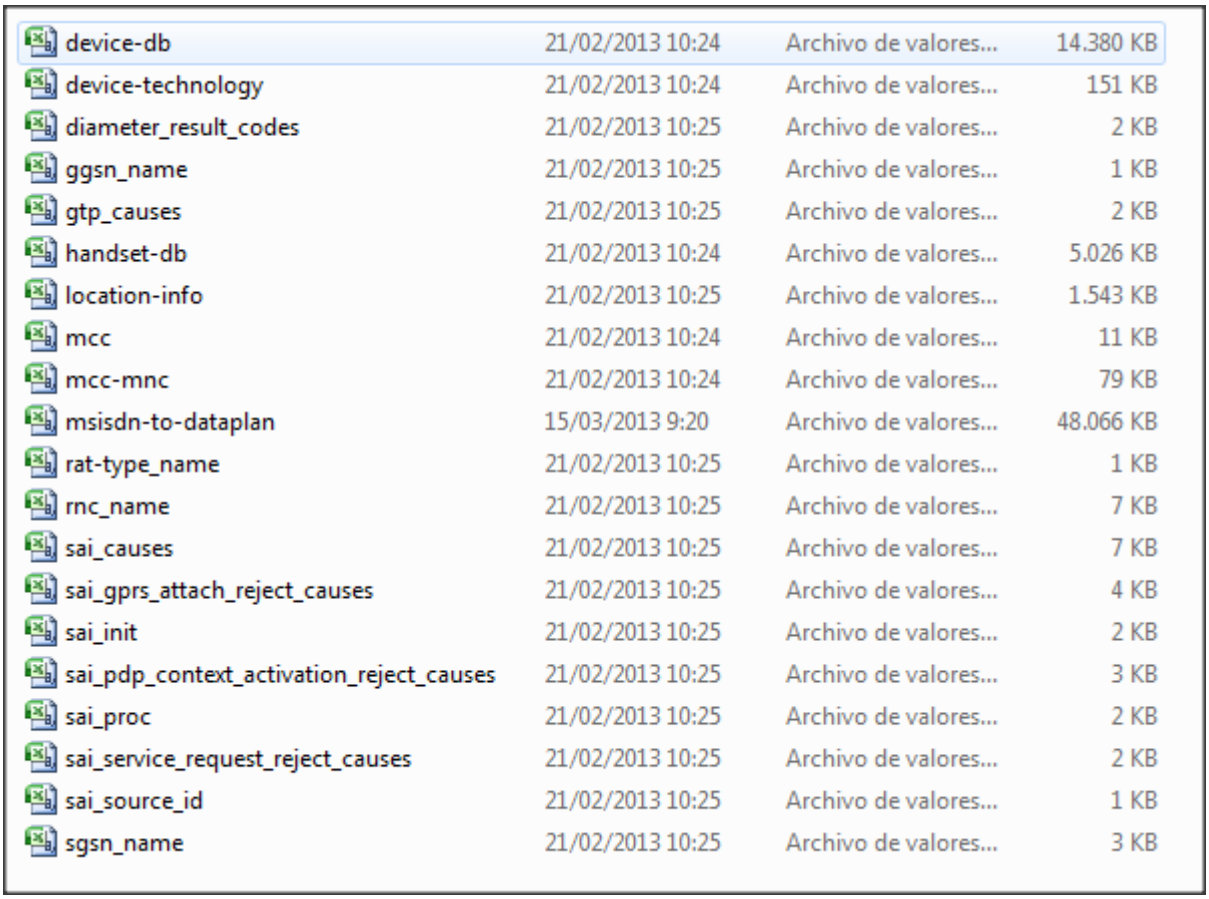
1. There are problems with the normal or wizard ZStore connection (URL, password…)
2. Check if the /opt/zl/nwi/etc/base folder contains all the correct cfg’s (gui-metedata.cfg, for example, was deleted while installing wizard one time)
3. Check if the password written in “/opt/zl/gui/bin/setup gui” is zhilabs12 or the stored password in the zstore for admin user:



Reference files

There is an error in warn log, it cannot find decorator files. So it is necessary to copy decorator files from Colombia server to ours.

```
Mar 15 11:00:30 arcadiev4 /opt/zl/nwi/bin/zen-nwi[32010]:
[ERROR][zl::rules::DSVArrayDecoratorActionTask::readDSVFile][/m0/zenwft_380_0:/m0/zenwft_380_0/2_2
_probe-node-device-and-dataplan]: Cannot open DSV file (/opt/zl/nwi/var/msisdn-to-dataplan.csv)
```



Data not processed or not stored in ZStore

If the data is not passing from Collected to Processed or processing folder, it must be cheked the cfg files into /opt/zl/nwi/etc/base path. This configuration must cause data stops. After changing it, zen services must be restarted.

If data is being processed, but not stored in zstore, the process must be forced, executing the next command:

```
# /opt/zl/nwi/bin/update-tables --datastore=report-summary --select=0 --add-table=gn_app-site-900-
timeline --from=yesterday --to=now --zstore=/m0/zen5/zstore-frontend
```

Or wait until the programmed night scripts are executed.

Error in wizards

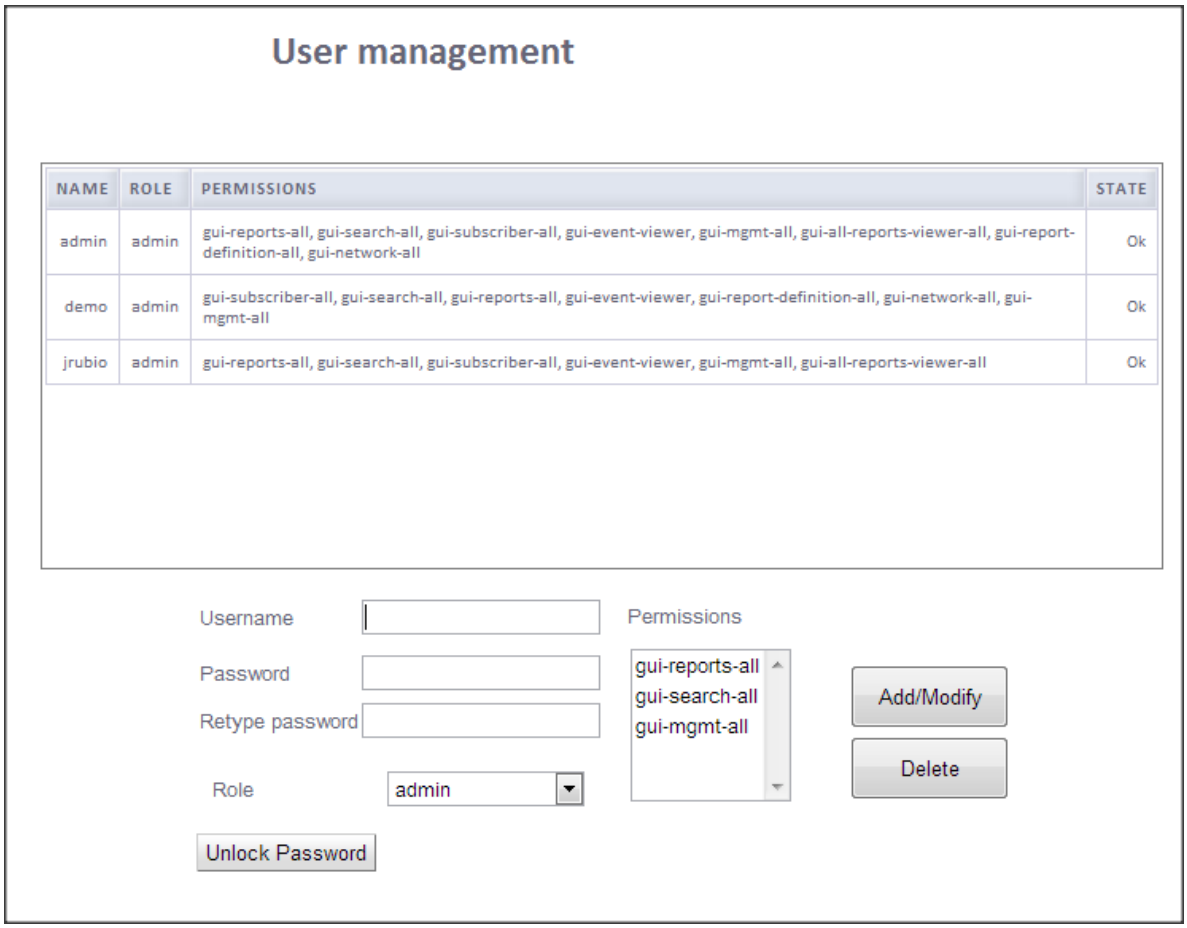
If wizards cannot be launched, it can be reviewed the next step:

1. Look if the rdefs files of all the machines are copied to the correct path in the GUI machine (/opt/zl/etc/wizard/rdefs).

Missing HP CEA GUI options

You can acces to the GUI with an user that can authenticate, and check that there are missing options in the screen, like Dataflow Console and Network Inspector.

This is caused by the permissions assigned to the user. It can be checked into the administration console. When it is accessed, it can be seen the list of permissions that can be assigned to the user, and the list of users and permissions:



It can be seen the list of available permissions looking into the file:

```
#/opt/zl/nwi/etc/base/authentication.cfg
```

It can be seen the list of permissions that are available in the GUI:

```
permissions /permissions/admin
   permission gui-subscriber-all
   permission gui-search-all
   permission gui-reports-all
   permission gui-event-viewer
   permission gui-report-definition-all
   #permission gui-capture-all
   permission gui-network-all
   permission gui-mgmt-all
!
```

If it is needed to have new permissions available in the GUI administrator, they must be added to the second screen of setup-GUI, in the list of “Available permissions”

.

There are available the next permissions:

- gui-reports-all
- gui-search-all
- gui-subscriber-all
- gui-event-viewer
- gui-mgmt-all
- gui-all-reports-viewer-all
- gui-report-definition-all: Dataflow console
- gui-network-all: Network inspector