

# BL8x0c i2: Overview, Setup, Troubleshooting, and Various Methods to Install OpenVMS

Aditya B S and Srinivas Pinnika



BL8x0c i2: Overview, Setup, Troubleshooting, and Various Methods to Install OpenVMS .....	1
Intended Audience.....	2
Abbreviations .....	2
Introduction to HP Integrity BL8x0c i2 Server Blade .....	2
BL860c i2 Blade Components .....	4
c-CLASS Enclosures.....	5
Onboard Administrator .....	6
Integrated Lights-Out (iLO) Web Interface .....	9
Prerequisites .....	9
Overview of BL8x0c i2 server blades setup.....	10
Methods to Install OpenVMS.....	13
vMedia .....	13
External or Internal USB DVD Drive .....	13
InfoServer.....	13
VMS Kit Disk on SAS Disk .....	13
VMS Kit Disk on a USB Flash Drive/Disk .....	14
Virtual Connect Technology .....	16
Introduction to Virtual Connect .....	16
HP Virtual Connect Enterprise Manager.....	16
HP Virtual Connect Flex-10 Technology .....	17
Virtual Connect Manager .....	17
Virtual Connect Firmware .....	17
Virtual Connect Ethernet Modules .....	18
Virtual Connect Fiber Channel Modules.....	19
BL8x0c i2 Troubleshooting Tips .....	19
References.....	23

## Intended Audience

This paper is intended for OpenVMS system administrators who are planning to install and run OpenVMS on the BL8x0c i2 hardware. It provides quick reference information, as well as details on how to install and configure various hardware components, troubleshoot, and configure the Integrity i2 server blades.

## Abbreviations

CLI	Command Line Interface
CM	Command Menu
DIMM	Dual-in Line Memory Module
FC	Fiber Channel
GUI	Graphical User Interface
iLO	Integrated Lights Out
ICH	I/O Controller Hub
LOM	LAN On Motherboard
LUN	Logical Unit Number
OA	Onboard Administrator
ORCA	Option ROM Configuration for Arrays
SAS	Serial Attached SCSI
SCSI	Small Computer System Interface
SUV	Serial, USB and VGA
USB	Universal Serial Bus
VC	Virtual Connect
VCM	Virtual Connect Manager

## Introduction to HP Integrity BL8x0c i2 Server Blade

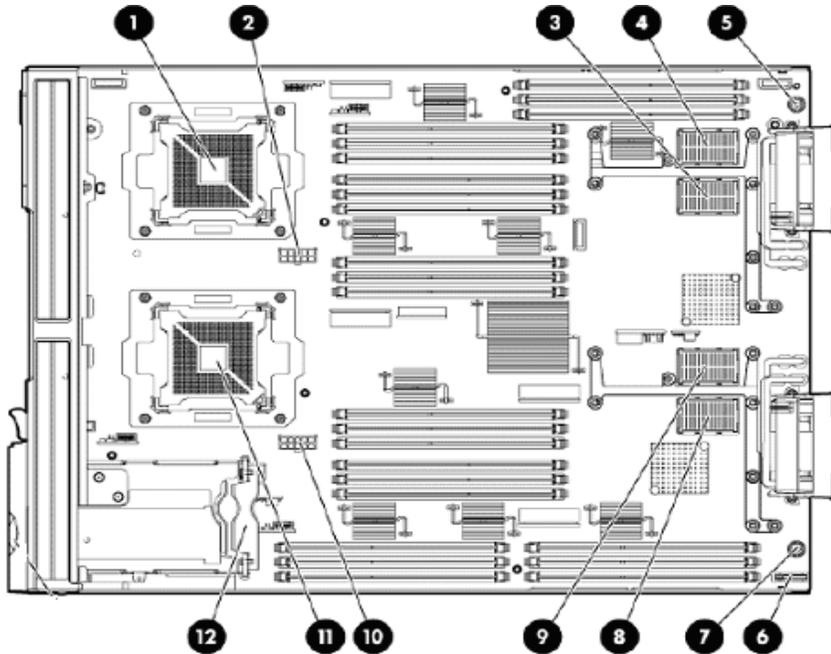
We know that blades have advantages with respect to more processing power in less space, simplified cabling, storage, maintenance and shared resources. A single enclosure can house multiple servers that share power source and other components, and also consolidate related resources, such as storage and networking equipment, into a smaller architecture than would be the case with a farm of regular servers.

BL8x0c i2 is a full-height Integrity server blade with the Intel Itanium 9300 processor series. The family of BL8x0c i2 products includes single blade 2S (BL860c i2), dual blade 4S (BL870c i2), and quad blade 8S (BL890c i2) variants (where S represents the number of CPU sockets), each capable of running a single operating system image across all blades/sockets. The Intel Itanium 9300 processor is available both as quad-core and also as dual-core.



BLADE	SOCKETS (Cores)	DIMM Slots	Max. Memory Support (with 8GB DIMM's)	No of PCIe Mezz Cards	No of SAS Hard Disks
BL860c i2	2S (8 Cores)	24	192 GB	3	2
BL870c i2	4S (16 Cores)	48	384 GB	6	4
BL890c i2	8S (32 Cores)	96	768 GB	12	8

## BL860c i2 Blade Components



- 1 CPU 0
- 2 CPU 0 POWER CONNECTOR
- 3 TYPE 1 MEZZANINE CONNECTOR SLOT 1
- 4 TYPE 1 or 2 MEZZANINE CONNECTOR SLOT 2
- 5 THUMBSCREW 1
- 6 BATTERY
- 7 THUMBSCREW 2
- 8 ICH MEZZANINE CONNECTOR SLOT
- 9 TYPE 1 or 2 MEZZANINE CONNECTOR SLOT 3
- 10 CPU 1 POWER CONNECTOR
- 11 CPU 1
- 12 SAS BACK PLANE

For complete preparation and installation guidelines for the BL8x0c i2 server in the c-class enclosure, see the *HP Integrity BL860c i2, BL870c i2, and BL890c i2 Server Blade User Service Guide*:  
<http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c02110937/c02110937.pdf>

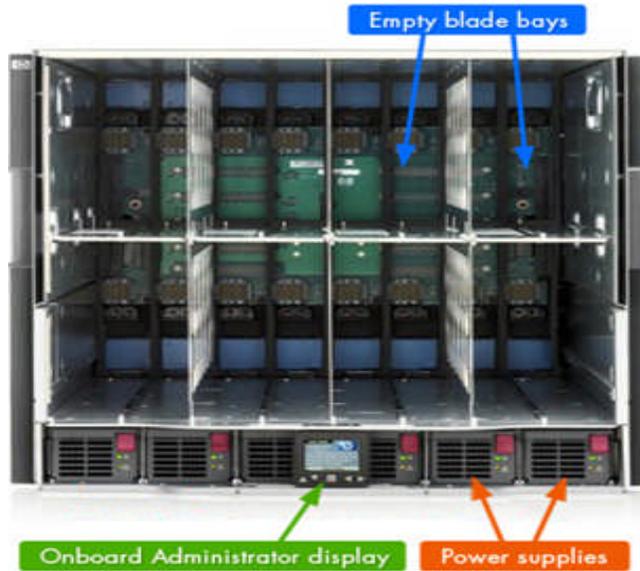
## c-CLASS Enclosures

HP offers two versatile c-Class enclosure models:

- HP Blade System c7000 Enclosure
- HP Blade System c3000 Enclosure

The c7000 provides 16 device bays and eight interconnect module bays in a 10U rack-mount configuration.

C7000 Enclosure Front View



C7000 Enclosure Rear View



## C3000 Enclosure Front View

The c3000 provides eight device bays and four interconnect module bays in a 6U rack-mount or tower configuration.



## C3000 Enclosure Rear View



Both enclosure models also include the Onboard Administrator and the Insight Display diagnostic panel. They use the same hardware, software, and processes for management.

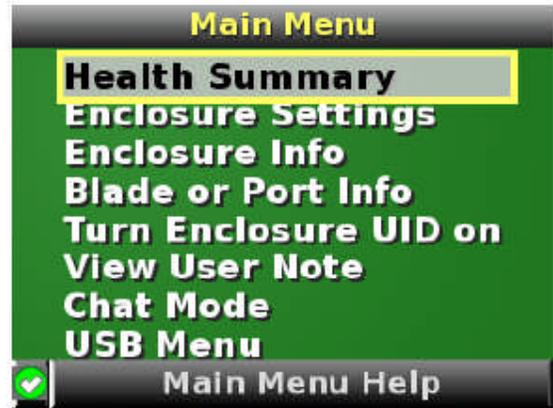
## Onboard Administrator

The core of c-class enclosure management is the Blade System Onboard Administrator module. It performs four management functions for the entire enclosure:

- Detect component insertion and removal
- Identify components and required connectivity
- Manage power and cooling
- Control components

The following methods are different ways for technicians and administrators to access the Onboard Administrator:

An Insight Display screen on each HP Blade System c-class enclosure provides ready access for quick setup and daily maintenance.



## Onboard Administrator Command Line Interface (CLI)

The Onboard Administrator CLI allows administrators to use serial, telnet, or SSH connections to control enclosure and device operation, including the use of scripts for automation. CLI commands include commands to connect to the iLO on each compute blade and to any supported interconnect module management processors such as Virtual Connect.

```
c7k1-oa2> show oa info
Onboard Administrator #1 information:
  Product Name   : BladeSystem c7000 Onboard Administrator
  Part Number    : 412142-B21
  Spare Part No. : 414055-001
  Serial Number  : 12345678901234
  UID           : 0912345678901234
  Manufacturer   : HP
  Firmware Ver. : 3.00 Mar 19 2010
  Hw Board Type  : 0
  Hw Version     : A0

c7k1-oa2> show enclosure status
Enclosure:
  Status: OK
  Unit Identification LED: On
  Diagnostic Status:
    Internal Data      OK

Onboard Administrator:
  Status: OK

Power Subsystem:
  Status: OK
  Power Mode: Not Redundant
  Power Capacity: 13500 Watts DC
  Power Available: 9785 Watts DC
  Present Power: 2755 Watts AC

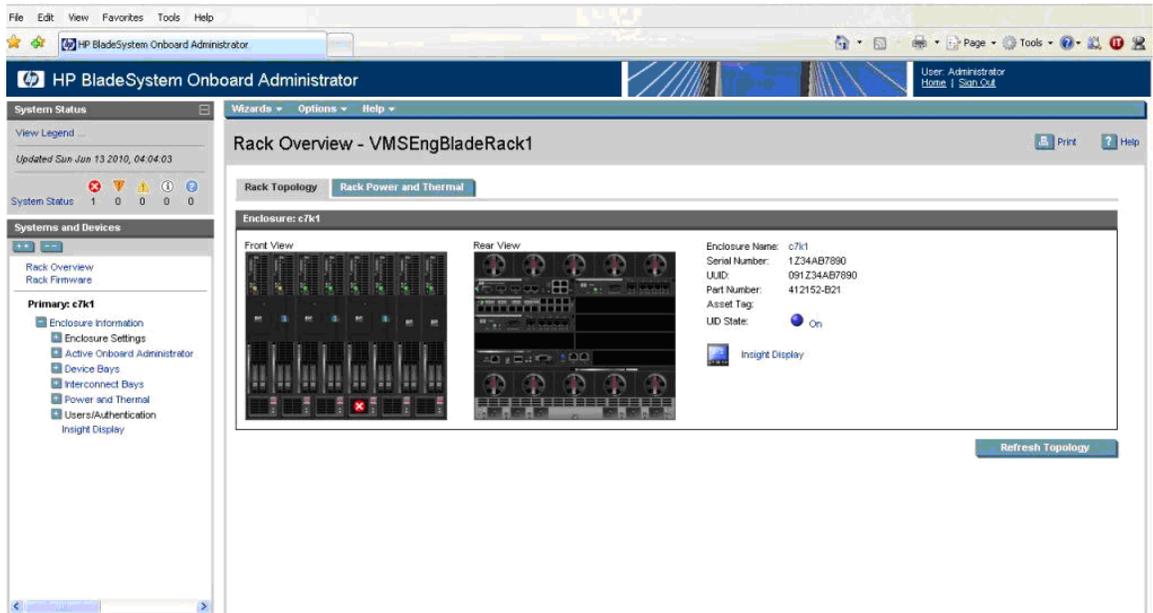
Cooling Subsystem:
  Status: OK
  Fans Good/Wanted/Needed: 10/10/9
  Fan 1: 6658 RPM (37%)
  Fan 2: 6649 RPM (37%)
  Fan 3: 7706 RPM (43%)
  Fan 4: 7694 RPM (43%)
  Fan 5: 7696 RPM (43%)
  Fan 6: 6648 RPM (37%)
  Fan 7: 6652 RPM (37%)
  Fan 8: 7700 RPM (43%)
  Fan 9: 7698 RPM (43%)
  Fan 10: 7703 RPM (43%)

c7k1-oa2>
```

## Onboard Administrator Graphical User Interface

The GUI provides remote administration capabilities from a desktop web browser. The GUI allows administrators to simplify tasks such as managing users and network settings, virtual power control, boot order control, and enclosure DVD attachment to one or more blades. The GUI can also simplify administrative tasks when identical operations are performed on multiple compute blades.

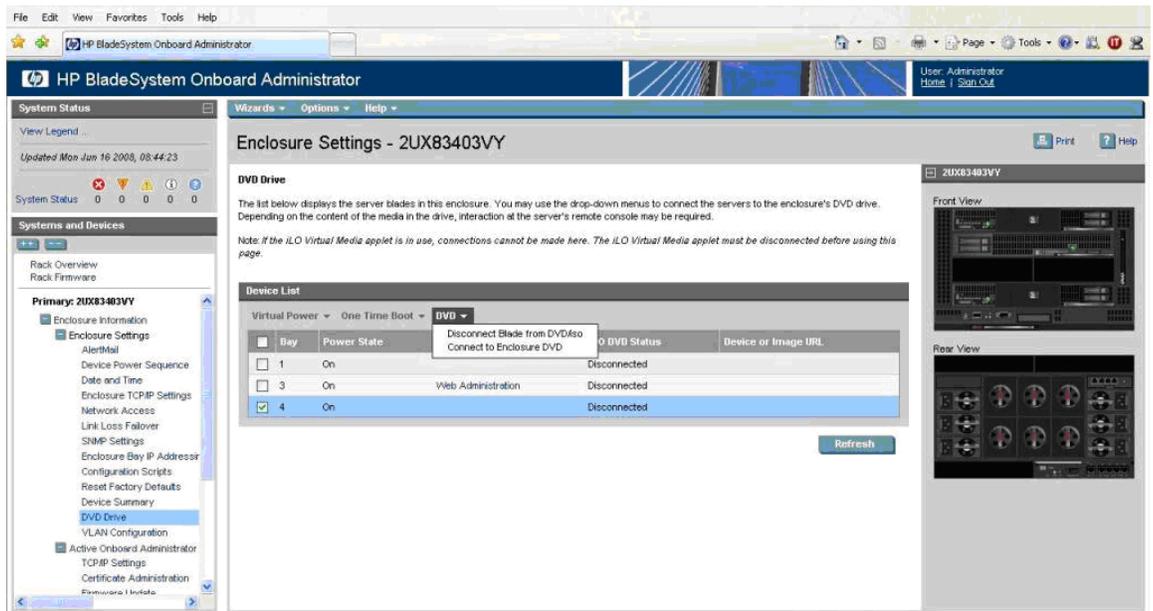
The GUI contains graphical views for server-to-interconnect port mapping, zone cooling measurements, and power use history. At a glance, the administrator can tell if any devices in the enclosure need attention. If multiple enclosures in a rack are connected using the enclosure links, the administrator can view and control one or more enclosures from a single GUI.



## Enclosure DVD

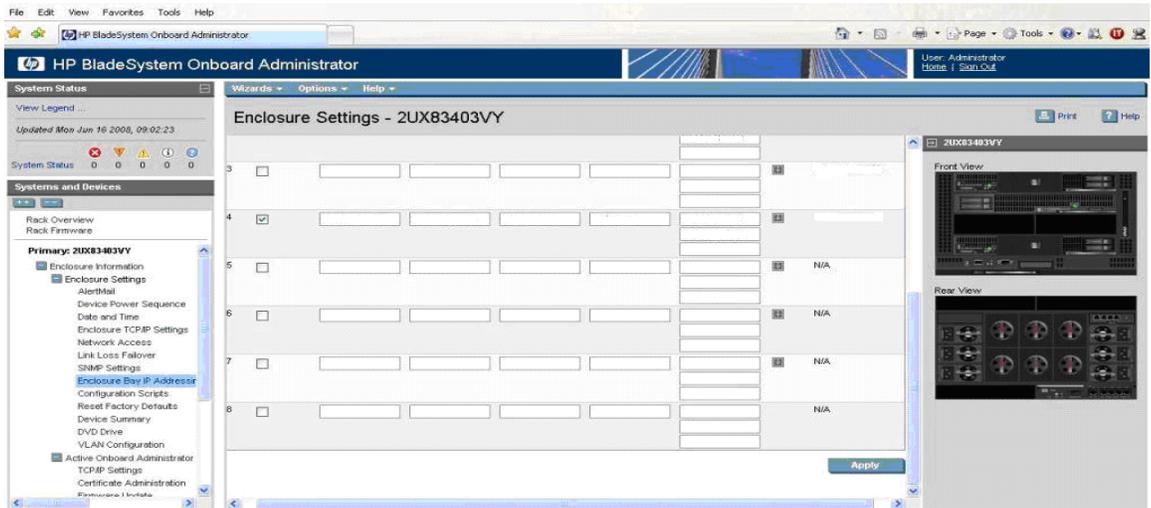
The Onboard Administrator (OA) can provide USB CD/DVD drive connectivity to one or more servers in an enclosure with the enclosure DVD feature. In addition, with a USB key plugged into the Onboard Administrator, ISO files can be connected to one or more servers, the OA firmware can be updated from a file, and the enclosure configuration can be saved or restored from a file on the USB key. This feature can dramatically simplify the firmware update of all servers, the Onboard Administrator modules, or initial setup of an enclosure from a custom configuration file.

## DVD window access from OA Web Interface



## Enclosure Bay IP Addressing

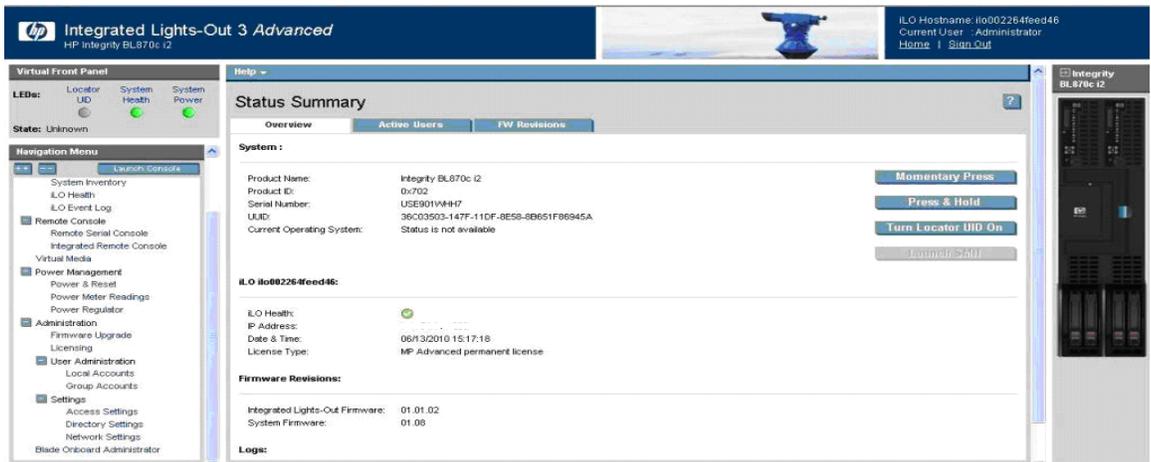
The Onboard Administrator significantly enhances the management network infrastructure by offering a single point to assign IP addresses to the compute blade iLO management ports and the interconnect module management ports.



## Integrated Lights-Out (iLO) Web Interface

HP Integrity Integrated Lights-Out (iLO) simplifies remote management of your Integrity servers from anywhere in the world.

Shown below is the iLO web interface:



iLO can be used to connect to system serial console using “remote serial console” option and also install the operating system using vMedia option. iLO also supports Integrated Remote Console which provides a high-performance graphical remote console.

## Prerequisites

To setup or to configure the HP Integrity BL8x0c i2 server blades, the following prerequisites for hardware, firmware and software must be met:

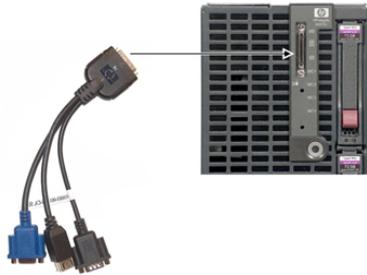
- C7000 and/or C3000 c-class enclosures.
- Onboard Administrator firmware – recommended version.

- BL8x0c i2 Blade and required/necessary IO cards have to be updated with the latest supported firmware version.
- SUV Cable for Serial, USB and VGA connectivity.
- Respective IP's (OA, MP LAN) have to be configured.
- OpenVMS V8.4 for Integrity server kit in ISO or BCK format.
- HP DVD burnt with OpenVMS V8.4 ISO.
- Update kits for OpenVMS V8.4 for Integrity servers.

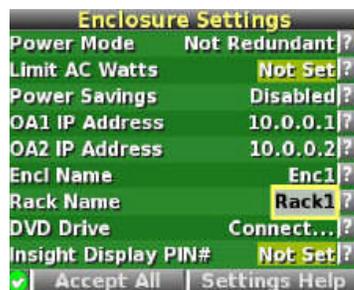
## Overview of BL8x0c i2 server blades setup

To setup the BL8x0c i2 server blades, follow these steps regarding logging into OA and upgrading OA firmware:

1. Plug the BL8x0c i2 blade to the C7000 or C3000 enclosure.
2. Connect the SUV cable to the SUV port on the Server Blade. Access the blade using the serial port (RS232 port) on the SUV cable, which is the cable with 3 ports or serial, USB and VGA.



3. Assign the Onboard Administrator (OA) IP address on the OA console present on c-Class enclosure.
4. Enter the username and password from the tag supplied with the OA module to access the remote OA web interface and complete the OA first-time installation wizard.



5. The enclosure information screen displays information about the enclosure, including the following details:
  - Active OA IP address
  - Active OA service IP address
  - Current health status of the enclosure
  - Current enclosure ambient temperature
  - Current AC input power to the enclosure
  - Enclosure name
  - Rack name

For detailed procedure, see the *HP BladeSystem c7000/c3000 Enclosure Setup and Installation Guide*:

**C7000:**

<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00698286/c00698286.pdf>

**C3000:**

<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01167165/c01167165.pdf>

6. OA firmware version can be obtained either from the web interface of the OA or from the OA's Command Line Interface (TELNET session) using the SHOW OA INFO command.
7. Based on the information displayed, it can be upgraded to the recommended firmware version. For more information about OA firmware and installation instructions, see the following website:  
<http://h20000.www2.hp.com/bizsupport/TechSupport/SoftwareIndex.jsp?lang=en&cc=us&prodNameId=4204753&prodTypeId=3709945&prodSeriesId=4186428&swLang=13&taskId=135&swEnvOID=4094>

Logging into MP and configuring MP LAN:

1. Login to the blade MP using the username and password present on the blade server tag. Type CM to reach the MP command menu and create a new user with the necessary access setting.
2. From the MP command menu issue the command LC (LAN Configuration) to configure the MP LAN. If you do not have a DHCP server on your local network, and are assigning a static IP address to the server blade, you must disable DHCP on the server blade. To add static IP address, subnet masks, and gateway address, follow these steps:  
NOTE: Obtain the required addresses from a system administrator.
  - a. From the MP Main Menu, enter the "CM" command, which brings up the MP command menu screen is displayed.
  - b. Enter the "LC" command, LC Menu screen is displayed. At each prompt you may type DEFAULT to set the default configuration or Q to Quit.

*Default LAN Configuration:*

```
- - MAC Address           : 0x00110aa50058
D - DHCP Status          : Disabled
I - IP Address           : 0.0.0.0
M - MP Host Name         : ilob5122
S - Subnet Mask           : 0.0.0.0
G - Gateway Address      : 0.0.0.0
L - Link State           : Auto Negotiate
O - Duplex Option        : n/a
R - Remote Serial Console Port : 2023
H - SSH Access Port      : 22
```

Enter parameter(s) to change. A to modify All. Or (Q) to Quit:

- c. From the LC Menu, you can select any of the options as follows:
  - Enter "d" to access the DHCP status screen and follow the onscreen instructions to change the DHCP status from Enabled to Disabled.
  - Enter "Y" to confirm the DHCP status change.
  - Enter "I" to access the IP Address screen and follow the onscreen instructions to add static IP address obtained from the system administrator.

- Enter "S" to access the subnet mask screen and follow the onscreen instructions to add subnet mask address obtained from the system administrator.
  - Enter "G" to access the gateway address screen and follow the onscreen instructions to add gateway address obtained from system administrator.
  - Verify the configuration and confirm the changes.
  - The server blade is now set up for remote access with static IP address.
3. Enable TELNET access using the "SA" command.

```
[ilo002264fef14d] CM:hpiLO-> sa

SA

This command allows you to modify MP access configuration.

Current Set Access Configuration:
  T - Telnet      : Enabled
  W - Web SSL    : Enabled
  H - SSH        : Enabled

Enter parameter(s) to change, A to modify All, or [Q] to Quit:
```

4. Reset the MP using the XD -R -NC command. You can access MP/iLO by using the web interface and also by using the TELNET session on the Remote console.

#### Upgrading MP firmware:

1. From the MP Command Menu (CM), check the blade firmware version using the command "SR" or "SYSREV" command. Upgrade the firmware to the recommended version and also ensure that the firmware for the respective IO Cards (LOM, SAS and so on) are the latest versions.
2. For the steps to obtain and update the firmware, see:  
<http://h20000.www2.hp.com/bizsupport/TechSupport/SoftwareIndex.jsp?lang=en&cc=us&prodNameId=4204753&prodTypeId=3709945&prodSeriesId=4186428&swLang=13&taskId=135&swEnvOID=54>

#### Getting to EFI and configuring LUN:

1. POWER ON the system and get to the SHELL prompt.
2. MAP -R command on the Shell> provides the list of disks (BLKx device). If no disks are detected, the LUNs are not created.
3. To create LUNs use the DRVCFG command provided by ORCA utility. For a detailed procedure on how to use DRVCFG command, see section "*BL8x0c i2 Troubleshooting Methods.*"
4. After the LUN's are created, and the controller is restarted, the shell "MAP -R" command must display the BLKx devices.
5. Install OpenVMS using one of the following methods as described in Section "*Methods to Install OpenVMS.*"

## Methods to Install OpenVMS

OpenVMS can be installed on an Integrity server system using any one of the method as explained below.

### vMedia

For a detailed description on how to install OpenVMS using vMedia, see the *HP OpenVMS Version 8.4 Upgrade and Installation Manual* at:

[http://h71000.www7.hp.com/doc/84final/ba322\\_90087/ba322\\_90087.pdf](http://h71000.www7.hp.com/doc/84final/ba322_90087/ba322_90087.pdf).

### External or Internal USB DVD Drive

Note: C3000 enclosure has an internal USB DVD Drive which can be connected to a particular blade using the Onboard Administrator.

The C7000 enclosure does not have an internal DVD drive, but an external USB DVD drive can be connected to a USB port via a SUV cable. This method can be used on C3000 enclosure as well.

Insert the OpenVMS V8.4 DVD into the respective DVD drive and boot the system with the DVD, which provides the options to install or upgrade OpenVMS.

### InfoServer

For a detailed description on how to setup the InfoServer and install OpenVMS using InfoServer, see the *HP OpenVMS Version 8.4 Upgrade and Installation Manual* at:

[http://h71000.www7.hp.com/doc/84final/ba322\\_90087/ba322\\_90087.pdf](http://h71000.www7.hp.com/doc/84final/ba322_90087/ba322_90087.pdf)

The following examples below explain how to perform the InfoServer boot.

Example 1: InfoServer boot with memory disk and directed lanboot and without DBPROFILE:

```
SHELL> LANBOOT SELECT -SIP <SERVER IP> -CIP <CLIENT IP> -GIP <GATEWAY IP>
-M <SUBNET_MASK> -B "<FULL PATH TO THE BOOT FILE ON THE BOOT SERVER>" -OD
"-FL 0,200400 -SERVICE <SERVICE NAME>"
```

Example 2: InfoServer boot without memory disk and with directed lanboot (by choosing services)

```
SHELL> LANBOOT SELECT -SIP <SERVER IP> -CIP <CLIENT IP> -GIP <GATEWAY IP>
-M <SUBNET MASK> -B "<FULL PATH TO THE BOOT FILE ON THE BOOT SERVER>"
```

### VMS Kit Disk on SAS Disk

Copy the OpenVMS saveset on to BL8x0c i2 server blade running OpenVMS and perform the following steps. For example, let us assume DKA0: as a target device (VMS kit disk).

NOTE: This method can be used on a system that already has OpenVMS installed and running.

1. Foreign mount the target disk on which the kit disk has to be created using the following command:  
\$ MOUNT /FOREIGN DKA0:
2. Take a back up of the OpenVMS V8.4 saveset onto the target disk using the following command:  
\$ BACKUP /IMAGE I64V84.BCK /SAVE DKA0:

3. After the backup is complete, dismount the target disk using:  
`$ DISMOUNT DKA0`

Now the target disk is ready to be used as a kit disk. Boot the system with the newly created kit disk, which provides the options to install or upgrade OpenVMS.

## VMS Kit Disk on a USB Flash Drive/Disk

Note: USB flash drives/disks are not supported on OpenVMS. However, some makes of flash drives are found to work with OpenVMS. The minimum size of the USB flash drive/disk required for this procedure must be 5 GB. HP recommends using this method if none of the above options are feasible.

To create a VMS kit disk on a USB flash drive/disk, you can use one of the following methods:

### Method 1

Copy the OpenVMS V8.4 saveset onto system running OpenVMS and perform the following steps. Plug the USB flash drive/disk to the USB port. This device will be configured as DNxx device.

NOTE: This is only possible on a system that already has OpenVMS installed and running. If this method needs to be used on a fresh system, then the kit disk needs to be created on another system running OpenVMS.

For example, let us assume DNA0: as a target device (VMS kit disk).

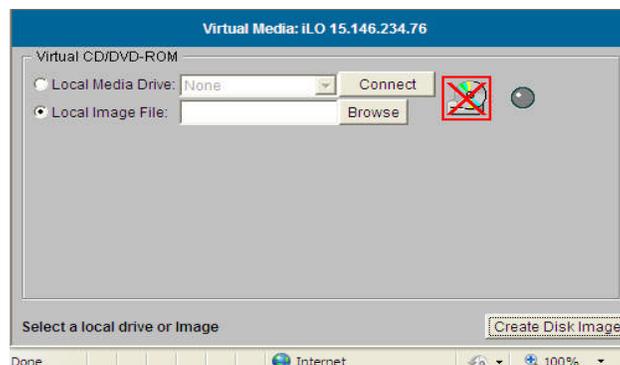
1. Mount the USB flash drive/disk (DNA0:) which can be made bootable (kit disk) as foreign, using the following command:  
`$ MOUNT /FOREIGN DNA0:`
2. Take the back up onto the target disk by using the following command:  
`$ BACKUP /IMAGE I64V84.BCK /SAVE DNA0:`
3. After the backup is complete, dismount the target disk using:  
`$ DISMOUNT DNA0`

Now USB kit disk is ready. Plug the USB flash drive/disk (kit disk) to the USB port on the SUV of the target BL8x0c i2 system. Boot the system using the USB flash drive/disk (kit disk), which provides the options to install or upgrade OpenVMS.

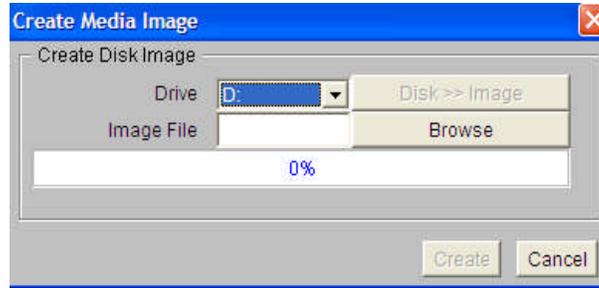
### Method 2

Place the OpenVMS V8.4 ISO on the Windows desktop and then plug in the USB flash drive/disk and perform the following steps:

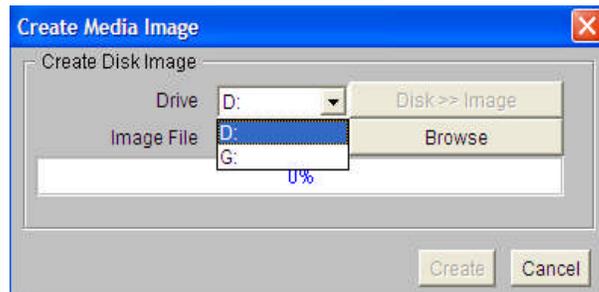
1. Login to the iLO web interface and launch vMedia.
2. Click Create Disk Image on the vMedia window.



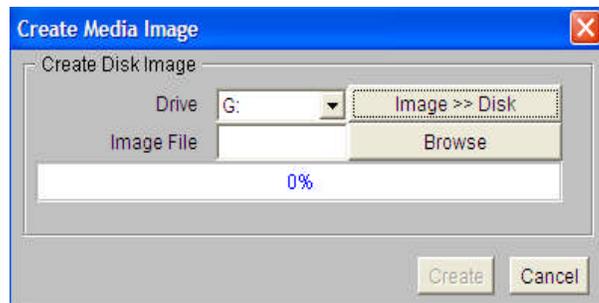
The Create Media Image window appears:



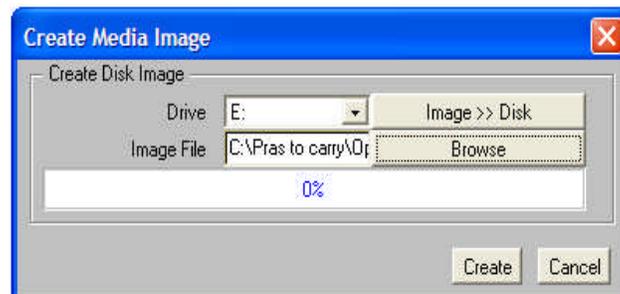
3. Click Drive menu and select the USB Drive as shown below, where, G: is the USB flash drive/disk.



4. To create VMS kit disk on a USB flash drive/disk from an OpenVMS V8.4 ISO image file, click the Disk>>Image to change it to Image>>Disk.
5. Click Browse and specify the location of the OpenVMS V8.4 ISO image file.



6. Click Create to start the preparation of VMS kit disk on a USB flash drive/disk.



7. Plug the USB (kit disk) to the BL8x0c i2 and boot the system, which provides options to install or upgrade OpenVMS.

NOTE: Booting the system either with VMS kit disk or DVD or vMedia or InfoServer – as explained above – provides the following options to install or upgrade the OpenVMS.

You can install or upgrade the OpenVMS Integrity server's operating system or you can install or upgrade layered products that are included on the OpenVMS Integrity server's distribution media (CD/DVD).

You can also execute DCL commands and procedures to perform "stand-alone" tasks, such as backing up the system disk.

Choose one of the following:

1. Upgrade, install, or reconfigure OpenVMS Integrity servers Version 8.4
2. Display layered products that this procedure can install
3. Install or upgrade layered products
4. Show installed products
5. Reconfigure installed products
6. Remove installed products
7. Find, install, or undo patches, as well as show or delete recovery data
8. Execute DCL commands and procedures
9. Shut down this system

Enter CHOICE or? for help: (1/2/3/4/5/6/7/8/9/?)

For a detailed installation or upgrade procedure information, see the *HP OpenVMS Version 8.4 Upgrade and Installation Manual* at:

[http://h71000.www7.hp.com/doc/84final/ba322\\_90087/ba322\\_90087.pdf](http://h71000.www7.hp.com/doc/84final/ba322_90087/ba322_90087.pdf)

## Virtual Connect Technology

### Introduction to Virtual Connect

Virtual Connect is the next step in virtualization that extends the benefits of virtualization beyond the server to other infrastructure.

Virtual Connect accomplishes this by defining a server connection profile for each server in the enclosure before the server is installed. These defined profiles establish MAC addresses for all the network adapters, world wide numbers for all the host bus adapters and SAN boot parameters.

Previously, network administrators only had two options to connect each of the servers to the outside world, either through pass-through or switches. With HP Virtual Connect Architecture, they will be able to manage the entire blade architecture, thereby reducing the burden of managing hundreds of switches and cables and thus reducing the cost.

### HP Virtual Connect Enterprise Manager

HP Virtual Connect Enterprise Manager (VCEM) is a management option for multiple BladeSystem enclosures configured with Virtual Connect. VCEM provides a central console that aggregates Virtual Connect resources, improves productivity, and enables faster response to changing data center workload demands. It also provides a single console to manage up to 800 BladeSystem enclosures and runs on Virtual Connect Enet Module.

## HP Virtual Connect Flex-10 Technology

Virtual Connect Flex-10 technology builds even more flexibility into each server blade to add up to 4 times as many NIC connections, fine tuning the bandwidth for each connection. It helps remove up to 75 percent of server edge infrastructure, lower purchase costs by up to 66 percent, and reduce power consumption up to 50 percent. It also enables you to transform your infrastructure and uncover its full potential.

## Virtual Connect Manager

The VC Manager contains utilities and profile wizards that allows the system administrators to create and allocate server connection profiles to servers. The server profiles include the Ethernet MAC addresses and Fiber Channel HBA world wide names or WWNs and SAN boot configurations.

Here is the sample screen shot of the VCM:

The screenshot displays the 'Define a Server Profile' wizard in the HP Virtual Connect Manager. The profile is named 'WebServer2'. It shows two Ethernet network connections (Physical ports) and two FC SAN connections (Physical ports). The Ethernet connections are 'Alpha' and 'Beta', both with status 'OK' and 'Enabled'. The FC SAN connections are 'Bay 5' and 'Bay 6', both with status 'OK' and 'Auto' port speed. Below the FC SAN connections, there is a section for 'Show Fibre Channel Boot Parameters' with two rows: 'Primary' and 'Secondary'. At the bottom, there is an 'Assign Profile to Server Bay' section with a 'Power' button set to 'On' and a 'Server Bay Assignment' section with a 'Select Location' dropdown. The interface includes a navigation pane on the left with options like 'View Legend', 'Events and Events', and 'Server Profiles'. The top right shows the user 'Administrator' and the date '2008 / 2008 / 01'.

## Virtual Connect Firmware

For more information about Virtual Connect firmware and upgrade procedures, see the following website:

<http://h20000.www2.hp.com/bizsupport/TechSupport/SoftwareIndex.jsp?lang=en&cc=us&prodNameId=4204762&prodTypeId=3709945&prodSeriesId=4186432&swLang=13&taskId=135&swEnvOID=4001#29154>

## Virtual Connect Ethernet Modules

This section provides a list of various VC Ethernet modules and their specifications.



	HP Virtual Connect Flex-10 10Gb Ethernet Module	HP 1/10Gb-F Virtual Connect Ethernet Module	HP Virtual Connect 4Gb Fibre Channel Module
<b>Blade type</b>	Single bay	Single bay	Single bay
<b>Network connections</b>	16 x 10Gb downlinks midplane 2 x 10Gb cross connect 1 x 10Gb copper uplinks CX-4 8 x 10Gb SR, LR, or LRM fiber uplinks SFP+ 1 management USB port 1 internal interface to c-Class Onboard Administrator Module	16 x 1Gb downlinks midplane 1 x 10Gb cross connect 1 x 10Gb copper uplinks CX-4 2 x 10Gb SR or LR fiber uplinks XFP 2 x 1Gb SX or RJ-45 fiber uplinks SFP 4 x 1Gb 1000/100/10Gb copper uplinks RJ-45 1 management USB port 1 internal interface to c-Class Onboard Administrator Module	16 internal 4Gb downlinks presented as F-Ports 4 external 4Gb uplinks presented as N-Ports
<b>Media types</b>	SFP+ SR, LR, LRM SFP SX, RJ-45 SFP + Copper Twinax CX-4 (IB4x)	SFP SX, RJ-45 FX SR and LR Copper RJ-45 100 Ohm 2-pair Cat5 UTP Twinax CX-4 (IB4x)	Small form-factor pluggable (SFP) laser 1/2/4Gb short wave up to 500 m (1,640 ft) 1/2/4Gb long wave up to 10 km
<b>Performance</b>	Line Rate, full-duplex 240Gbps bridging fabric Less than 2µs latency	Line Rate, full-duplex 62Gbps bridging fabric Less than 4µs latency	4Gbps line speed, full duplex 1.2 µ sec latency Maximum frame size 2112-byte payload Buffer-to-buffer flow control management Packet prioritization
<b>Protocol support</b>	802.1AB, 802.1D, 802.1Q, IEEE 802.2, 802.3ad	802.1AB, 802.1D, 802.1Q, IEEE 802.2, 802.3ad	NCITS T11 N_Port ID Virtualization (NPIV)
<b>Management</b>	Simple and intuitive Graphical User Interface and Setup Wizards Embedded SNMP v1, v2 Command Line Interface Port Mirroring—Any uplink port can be used as a dedicated mirrored port from the server port(s)	Simple and intuitive Graphical User Interface and Setup Wizards Embedded SNMP v1, v2 Command Line Interface Port Mirroring—Any uplink port can be used as a dedicated mirrored port from the server port(s)	Simple and intuitive Graphical User Interface and Setup Wizards accessible through VC Ethernet module Command Line Interface accessible through VC Ethernet module Embedded SNMP v1 and v2 SMI-S
<b>Extended management features</b>	Virtual Connect Enterprise Manager (VCEM) supports PXE, WOL, port VLAN, VLAN Tagging, VLAN pass through, IGMP Snooping, NIC Teaming Integrated with Onboard Administrator HP Systems Insight Manager Telnet, SNMP	Virtual Connect Enterprise Manager (VCEM) supports PXE, WOL, port VLAN, VLAN Tagging, VLAN pass through, IGMP Snooping, NIC Teaming Integrated with Onboard Administrator HP Systems Insight Manager Telnet, SNMP	Virtual Connect Enterprise Manager (VCEM) support HP Storage Essentials (FC Management MIB)
<b>High availability features</b>	Link Aggregation Protocol Automatic loop protection Mirrored profile database Multi-path heartbeat between redundant modules	Link Aggregation Protocol Automatic loop protection Mirrored profile database Multi-path heartbeat between redundant modules	Link Aggregation Protocol Automatic loop protection Mirrored profile database Multi-path heartbeat between redundant modules
<b>Security</b>	LDAP, SSL, role-based management	LDAP, SSL, role-based management	LDAP, SSL, role-based management
<b>Maximum per enclosure</b>	8	8	6

## Virtual Connect Fiber Channel Modules

This section provides a list of various VC Fiber Channel modules and their specifications.



	HP 8Gb Virtual Connect 20-Port Fibre Channel Module for BladeSystem	HP Virtual Connect 8Gb 24-Port Fibre Channel Module
<b>Blade type</b>	Single bay	Single bay
<b>Network connections</b>	16 internal 4Gb downlinks presented as F-Ports 4 external 4Gb uplinks presented as N-Ports	16 internal 8Gb downlinks presented as F-Ports 8 external 8Gb uplinks presented as N-Ports
<b>Media types</b>	Small form-factor pluggable (SFP) laser 2/4/8Gb short wave up to 500 m (1,640 ft) 1/2/4Gb long wave up to 10 km	Small form-factor pluggable (SFP) laser 1/2/4Gb short wave, long wave SFP+ 8/4/2Gb short wave, long wave
<b>Performance</b>	8Gbps line speed, full duplex 1.2 $\mu$ sec latency Maximum frame size 2112-byte payload Buffer-to-buffer flow control management Packet prioritization	8Gbps line speed, full duplex .74 $\mu$ sec latency Maximum frame size 2148 bytes (2112 byte payload)
<b>Protocol support</b>	NCITS T11 N_Port ID Virtualization (NPIV)	NCITS T11 N_Port ID Virtualization (NPIV)
<b>Management</b>	Simple and intuitive Graphical User Interface and Setup Wizards accessible through VC Ethernet module Command Line Interface accessible through VC Ethernet module Embedded SNMP v1 and v2 SMI-S	Simple and intuitive Graphical User Interface and Setup Wizards accessible through VC Ethernet module Command Line Interface accessible through VC Ethernet module Embedded SNMP v1 and v2 SMI-S
<b>Extended management features</b>	Virtual Connect Enterprise Manager (VCEM) supports HP Storage Essentials (FC Management MIB)	Virtual Connect Enterprise Manager (VCEM) supports HP Storage Essentials (FC Management MIB)
<b>High availability features</b>	Link Aggregation Protocol Automatic loop protection Mirrored profile database Multi-path heartbeat between redundant modules	Link Aggregation Protocol Automatic loop protection Mirrored profile database Multi-path heartbeat between redundant modules
<b>Security</b>	LDAP, SSL, role-based management	LDAP, SSL, role-based management
<b>Maximum per enclosure</b>	6	6

## BL8x0c i2 Troubleshooting Tips

This section provides the BL8x0c i2 troubleshooting tips.

### 1. Connecting power cables to C7000 enclosure

The order in which the power cables are connected to the C7000 enclosure is important. If the order is not followed properly, it results in powering up only a few power modules.

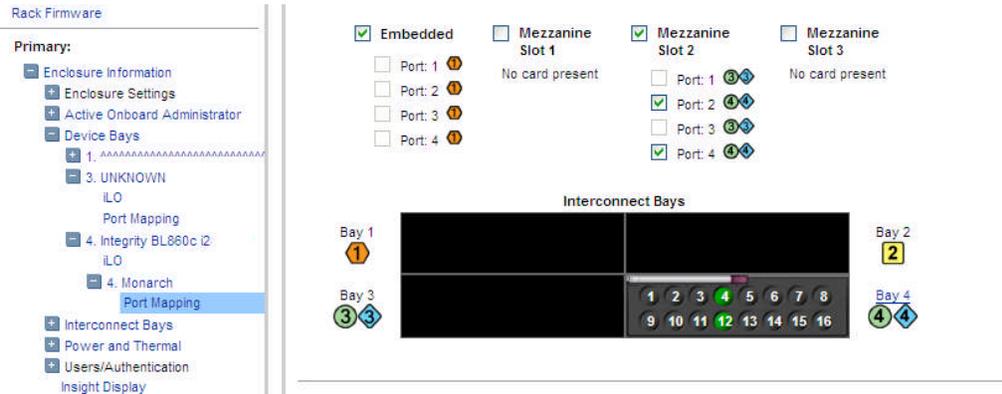
There are 6 power ports and the power cables must be connected in the following order:

- Power SLOT 1 and Power SLOT 4
- Power SLOT 2 and Power SLOT 5
- Power SLOT 3 and Power SLOT 6

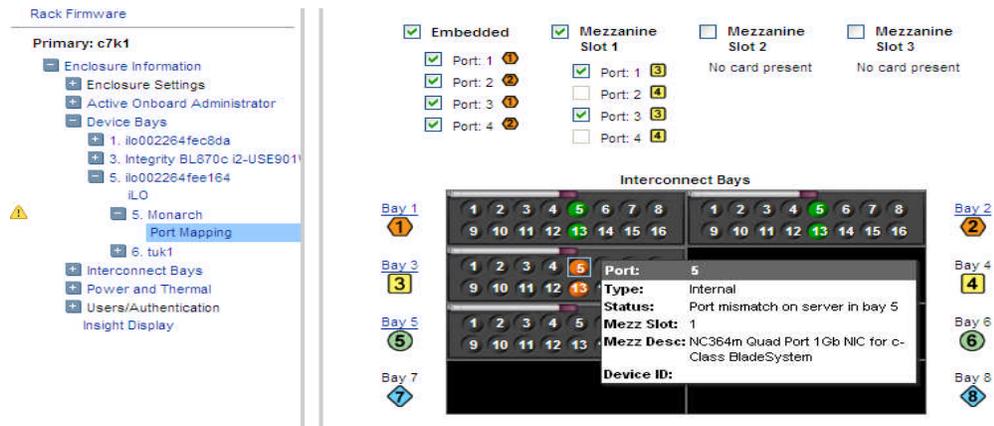
### 2. Port mapping of server blade to interconnect module

Ensure correct port mapping for proper operation of blades. If there is any mismatch in port mapping, it results in server blade degradation.

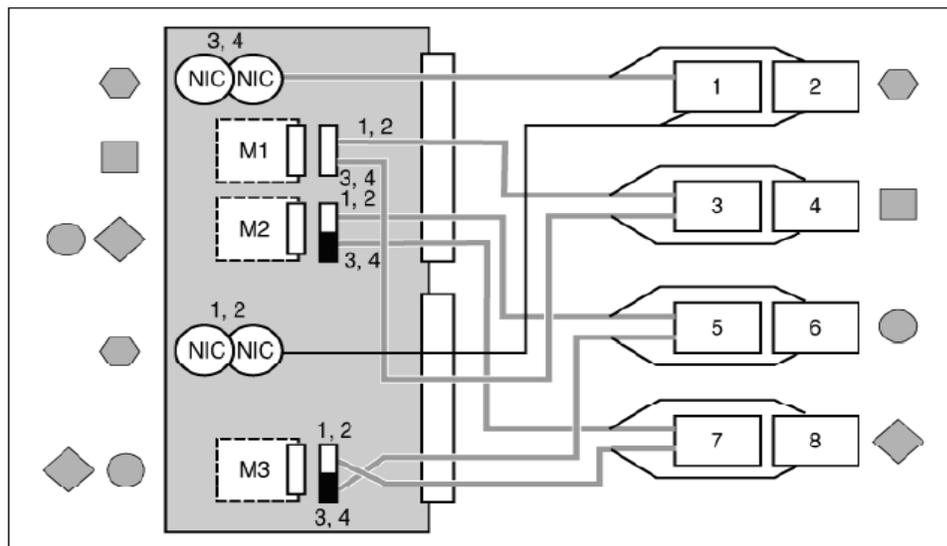
Port mapping of each server blade to interconnect module in the back plane can be viewed from the Onboard Administrator (OA) web interface. The figure below captured from the OA depicts the port mapping of the mezzanine cards in the server blade to the interconnect module in the interconnect bay with appropriate status.



If there is any mismatch in the port mapping, it will be highlighted in the OA web interface as shown below:

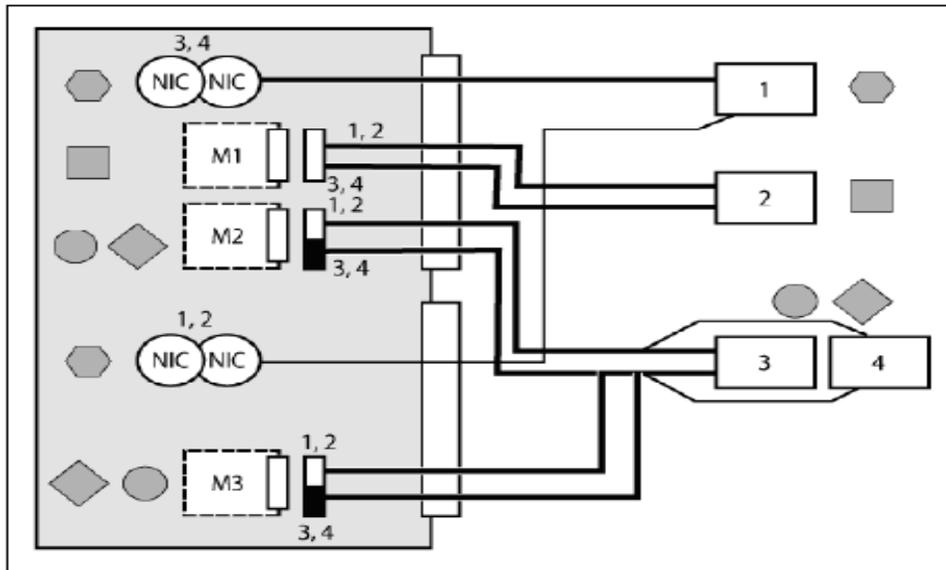


Proper port mappings on C7000 enclosure is as shown:



For detailed procedure, see the *HP BladeSystem c7000 Enclosure Setup and Installation Guide* at <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00698286/c00698286.pdf>

Proper port mappings on C3000 enclosure is as shown:



For detailed procedure, see the *HP BladeSystem c3000 Enclosure Setup and Installation Guide* at:

<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01167165/c01167165.pdf>

3. 4S (BL870c i2) and 8S (BL890c i2) setup

If you want to configure your blades as required to scale up/down needs, the following tip is useful:

**4-Socket configuration (BL870c i2):** Connect the two 2S blades (BL860c i2) using scalable blade link. The left most blade will always be the monarch and the other blade will be the auxiliary. Reset the monarch from the Onboard Administrator, and this will setup the 4S configuration.

**8-Socket configuration (BL890c i2):** Connect the four 2S blades (BL860c i2) using scalable blade link. The left most blade will always be the monarch and the other blades will be the auxiliaries. Reset the monarch from the Onboard Administrator, and this will setup the 8S configuration.

NOTE: Upgrading the firmware on the monarch will automatically upgrade the firmware on the auxiliary as well.

4. Creating LUNs using ORCA utility

If LUNs are not created, then the respective SAS disk devices cannot be detected.

- a. Create LUNs using the DRVCFG command from EFI (SHELL>)
- b. Find the "SAS driver ID" using the following command:  
SHELL> drivers

,  
,  
,  
,

**A4** 00000318 B X X 1 2 Smart Array SAS Driver v3.18  
MemoryMapped(0xB,0x

Where:  
'A4' is the SAS driver ID

- c. Obtain the respective "controller ID" using the following command:

```
SHELL> DRVCFG
```

This command lists a series of SAS driver IDs and their respective controller IDs as shown in the figure:

```
Shell> drvcfg
Configurable Components
Drv[A7] Ctrl[A6] Lang[en-US;eng]
Drv[A9] Ctrl[A8] Lang[en-US;eng]
Drv[B2] Ctrl[B1] Lang[en-US;eng]
Drv[B4] Ctrl[B3] Lang[en-US;eng]
Drv[A4] Ctrl[A3] Lang[eng]
```

In this example, 'A4' is the "SAS Driver ID" and its "controller ID" is 'A3.'

- d. Launch the ORCA utility using the respective driver ID and controller ID obtained from above steps:

```
SHELL> DRVCFG A4 A3 -s
```

```
Option Rom Configuration for Arrays, version 3.18
Copyright 2009 Hewlett-Packard Development Company, L.P.
Controller: HP Smart Array P410i

-----Main Menu-----
| Create Logical Drive |
| View Logical Drive  |
| Delete Logical Drive|
-----

<Enter> to create a new logical drive
<UP/DOWN ARROW> to select main menu option; <ESC> to exit
```

- e. Select Create Logical Drive option and then create the LUNs.
- f. Click Yes to restart the controller.  
From the SHELL> execute the MAP -R command to list the devices.

- 5. AUTOGEN unable to create page, swap, and dump files of appropriate sizes  
On systems with large physical memory, sometimes AUTOGEN does not create page, swap and dump files of appropriate size. HP recommends that the system manager review the AUTOGEN feedback report named SYS\$SYSTEM:AGEN\$PARAMS.REPORT and create the page, swap, and dump files of required sizes manually once the system boots up. See the AGEN\$FEEDBACK.REPORT for any AUTOGEN error messages and take appropriate actions.
- 6. Ensure to assign MP IP to monarch and its auxiliaries in 4S/8S configuration  
The firmware upgrade fails if the MP IP is assigned only to monarch but not to auxiliaries. To ensure proper firmware upgrade, it is necessary to assign the MP IP's to the auxiliaries as well.

## References

- HP BladeSystem c7000 Enclosure Quick Setup Instructions  
<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00698534/c00698534.pdf>
- HP BladeSystem c3000 Enclosure Quick Setup Instructions  
<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01167169/c01167169.pdf>
- BL8x0c i2 White Paper  
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA1-1295ENW.pdf>
- HP Integrity BL860c i2, BL870c i2 & BL890c i2 Server Blade User Service Guide  
<http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c02110937/c02110937.pdf>