



# Configuration Rules Document

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■ Number : MFG000574

■ Version M.3

## 1. OBJECTIVES

This document provides configuration rules useful for assembly, support and exploitation of MESCA modules.

It currently addresses:

- PCIe slots equipment limitations applying to 4S3U modules housing Nehalem or Westmere processors
- BIOS default settings, and EMM default settings per Business Unit

It comes in complement with module assembly rules, as depicted in Product Sets and Marketing Sets.

Version M : - Max NUMA nodes per module section changes  
- Partitioning enabling section removed: default value is 'enable' and it is OK for bullion and bullx

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## 2. PCIe slots equipment for 4S3U

- There are limitations in the number and the combination of PCI boards that can be used in a system. In order to help defining valid PCI-E configuration, a configuration tool PCI\_Board\_Consumption\_xx.ods (TST000135) is made available on the resource CD. However, this tool can not fully guaranty the configuration validity. .

Therefore, only the PCI-E configurations described in the document bullion\_PCI-E\_ValidatedConfiguration.pdf (VAL000342) or any configuration that would be a subset of one of them are considered valid and can be used for customer shipment.

- PCI-E Slot for LSI Megaraid 9261-8i PCI-E adapter use :

When your configuration includes a LSI Megaraid 9261-8i PCI-E adapter, it should be put either in PCI-E slot 0 or slot 1 of the last module of your system to minimize BIOS resource consumption.

- Emulex LPE PCI-Adapter configuration change when used with a LSI Megaraid 9261-8i adapter.

When the system is built to boot on SAS disks through a LSI megaraid PCI-E adapter, it is necessary to modify the configuration of all LPE PCI adapters present in the system in order to limit BIOS resources consumption. In order to do that, please refer to the following document :

- In quadri-modules configuration, the three slots attached to the eighth IOH cannot be used (the embedded ethernet controller neither)
  - The locking clips of the Ethernet Intel Pro boards are left sided. Avoid mounting these boards in slots 2 or 5, this will make easier the connection / disconnection of the Ethernet cable.
  - The locking clips of the FC Emulex boards are right sided. Avoid mounting these boards in slots 0 and 3, this will make easier the connection / disconnection of the FC cable.
  - 10Gb Myricom dual port boards cannot provide more than 8 Gb. This seems to be due to specific features of the Nehalem EX processor (re. Problem Report 03104).
  - 10 Gb Emulex dual port boards show a performance far lower than expected. This is being investigated.
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### 3. BIOS default settings change

#### ***X2APIC mode***

**Default** : disable.

The BIOS activates automatically the X2APIC mode if there are more than 8 Nehalem or more than 4 Westmere in the partition.

**bullion** : No change

**bullx** : No change

#### ***VT-d mode***

**Default** : enable.

You can disable the VT-d mode but notes that Vt-d must be enabled if the mode X2APIC is activated.

**bullion** : No change

**bullx** : can be changed to disable depending on the number of processors (see X2APIC mode above)

#### ***Max NUMA nodes per module***

This setting defines the max NUMA node number per module.

Possible values are 1, 2 or 4.

**Default**: 4

**bullion multi-module**: must be set to 2 if more than two modules

**bullion mono-module (w/o BCS)**: no change

**bullx** : no change

#### ***Kawela enabling***

**Default**: All Kawela are disabled except Kawela0 of IOH0 which is enabled

A Kawela connected to an IOH can be enabled through the BIOS setup :

Device Manager -> Advanced -> Boxboro Configuration -> General Configuration -> Kawela (Module i IOHj) -> 2 possible values PXE Enable/iSCSI Enable  
**bullion or bullx**: no change unless explicitly requested for a specific customer configuration.

### ***FAX Mode enabling***

**Default**: disable

This mode **must only be enabled to boot RedHat 5.7** in case of a configuration with 2 modules equipped with Westmere processors.

Note that FAX Mode is not supported in case of a 3 or 4 modules configuration

**bullion**: Device Manager -> Advanced -> Processor Configuration -> FAX Mode -> Enable

**bullx**: no change

### ***C-State Settings***

**Default**: Device Manager -> Advanced -> Processor Configuration

CPU C State <Disable>

Package C-State Limit <C3 State>

C3 Auto Demotion <Enable>

NHM C3 report <Enable>

**bullion and bullx**: Device Manager -> Advanced -> Processor Configuration

CPU C State <Enable>

Package C-State Limit: <C1 State>

C3 Auto Demotion <Disable>

NHM C3 report <Disable>

## **4.EMM default settings change**

### ***Hyperthreading***

**Default** : disabled (if EMM 11.10.10 build 002 or later)

The hyperthreading mode can be changed to enable (ie: multi threading) by the configuration WEB page of the EMM (Configuration -> Global Settings -> Functional Profiles) or through IPMI commands.

This command has to be launched on each module

**Bullx** : No change

**Bullion Multimodule** : No change

**Bullion Monomodule** : enable

### ***Configuring the Ultra Capa absence***

**Default** : present

The absence of Ultra Capa in a system can be configured in the EMM by using the following IPMI command :

ipmitool -H xx -U xx -P xx bulloem setcfg bmc.power.uc\_presence no

This avoid to get non significant messages about a failure of an ultra capa which doesn't exist.

This command has to be launched on each module

**bullion and bullx** : to be changed if the ultra capa is not present in the configuration

### ***Power supply redundancy disabling***

**Default** : redundancy enabled

If you have only one power supply in a system, the redundancy control done by the EMM can be disabled by using the following IPMI command :

`ipmitool -H xx -U xx -P xx bulloem setcfg bmc.power.psu_redundancy no`

This avoids to get redundancy warning events and get redundancy sensor in an error state in the WEB Sensors page.

This command has to be launched on each module

**bullion and bullx** : to be changed if there is no PSU for redundancy in the configuration

## **5.Additional recommendations**

### ***Hard Disk Head Parking***

By default, head parking is activated on embedded hard disks. Repetitive parking operation may significantly reduce hard disks MTBF

Therefore, it is recommended to disable head parking. This can be done under Linux Operating System with the following command :

- `hdparm -B 255 /dev/sda`

The current state can be checked with the following command :

- `hdparm -B /dev/sda`

This command is not persistent in case of system power off. It is recommended to add it into the operating system configuration files in order to have it executed at each system power on.

## **6.History**

Version G : - Ultra Capa Presence Configuration  
- Power supply redundancy Disabling

Version H : - Partitioning Enabling

Version I : - Hyperthreading for monomodule

Version J : - Hard Disk Head Parking  
- Internal Cabling Modification  
- FAX Mode activation  
- Patrol Scrubbing disabling

Version K : - C State settings  
- LSI Megaraid 9261-8i PCI-E adapter : slot position

Version L : - Patrol Scrubbing section removed: default value is 'enable' and it is OK for bullion and bullx  
- Reference to [bullion\\_PCI-E\\_ValidatedConfiguration.pdf \(VAL000342\)](#) to define authorised PCI-E configuration for bullion multi-modules systems

**End of document**