MAGNUM-HW
1RU Enterprise Class Server for MAGNUM
User Manual

EVERTZ MICROSYSTEMS LTD.
5292 John Lucas Drive,
Burlington, Ontario,
Canada L7L 5Z9
Phone: +1 905-335-3700
Sales: sales@evertz.com Fax: +1 905-335-3573
Tech Support: service@evertz.com Fax: +1 905-335-7571
Web Page: http://www.evertz.com

Version 2.1, October 2014

This page left intentionally blank

TABLE OF CONTENTS

Figures

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Feb 2014
2.0	Second Release, Information on updated hardware	Aug 2014
2.1	Updates made to Chapter 6	Oct 2014

This page left intentionally blank

1. OVERVIEW

MAGNUM-HW is the dedicated 1RU Enterprise Class Server hardware that runs the Magnum Control System. There are two generations of hardware in the field, Generation 1 and Generation 2.

Software Pre-installed:

- MAGNUM, requiring only license purchase to activate the MAGNUM modules

Key Features and Benefits (Generation 1):

- 1RU Enterprise Class Server
- Redundant power supplies
- Linux Operating System
- Supports all MAGNUM Software module configurations
- Four Ethernet ports
- RAID 1 / RAID 10 Drive Configuration

Figure 1-1: MAGNUM-HW (Generation 1) Front and Rear View

Key Features and Benefits (Generation 2):

- 1RU Enterprise Class Server
- Redundant power supplies
- Linux Operating System
- Supports all MAGNUM Software module configurations
- Six Ethernet ports
- RAID 10 Drive Configuration

Figure 1-2: MAGNUM-HW (Generation 2) Front and Rear View

2. SPECIFICATION (GENERATION 1)

Chassis:
- Form Factor
- 1U Rackmount

Dimensions:
- Height 1.7" (43mm)
- Width 17.2" (437mm)
- Depth 26.6" (676mm)
- Gross Weight 43 lbs (19.45 kg)

Front Panel:
- Buttons
  - Power On/Off Button
  - System Reset Button
  - UID Button

LEDs:
- Power LED
- Hard drive activity LED
- 2x Network activity LEDs
- System Overheat LED
- Universal Information (UID) LED

System Cooling:
- 5x Cooling Fans
- 1x Air Shroud

Power Supply:
- 700W AC-DC high-efficiency power supply with PMBus and I2C
- AC Input: 700W: 100-140 V, 50-60 Hz, 8.5-6 Amp
- DC Output +5V standby: 3 Amp
- DC Output +12V: 58 Amp @ 100-140V

Environmental:
- Operating Temperature: 10° to 35°C (50° to 95°F)
- Non-operating Temperature: -40° to 70°C (-40° to 158°F)
- Operating Relative Humidity: 8% to 90% (non-condensing)
- Non-operating Relative Humidity: 5 to 95% (non-condensing)

LAN:
- 4x RJ45 LAN ports
- 2x SFP+ LAN port
- 1x RJ45 Dedicated IPMI LAN port

USB:
- 2x USB rear ports

VGA:

- 1x VGA Port

Keyboard / Mouse:

- PS/2 keyboard and mouse ports

3. CONNECTIONS (GENERATION 1)

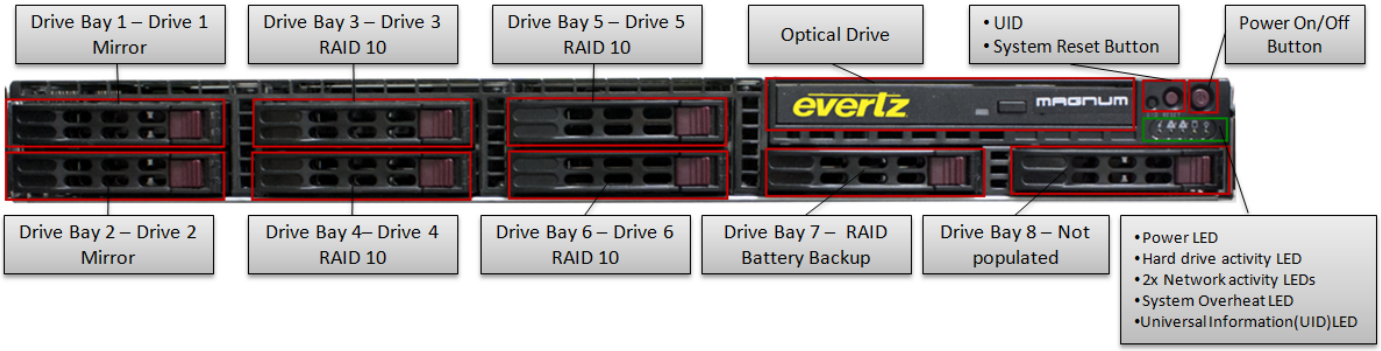

Figure 3-1: MAGNUM-HW (Generation 1) Connections - Front View

Front:

- Drive Bay 1 – Drive 1 Mirror
- Drive Bay 2 – Drive 2 Mirror
- Drive Bay 3 – Drive 3 RAID 10
- Drive Bay 4 – Drive 4 RAID 10
- Drive Bay 5 – Drive 5 RAID 10
- Drive Bay 6 – Drive 6 RADI 10
- Drive Bay 7 – RAID Battery Backup
- Drive Bay 8 – Not populated
- Optical Drive

Front Panel Buttons*:*

- Power On/Off Button
- System Reset Button
- UID Button

Front Panel Status:

- Power LED
- Hard drive activity LED
- 2x Network activity LEDs
- System Overheat LED
- Universal Information (UID) LED

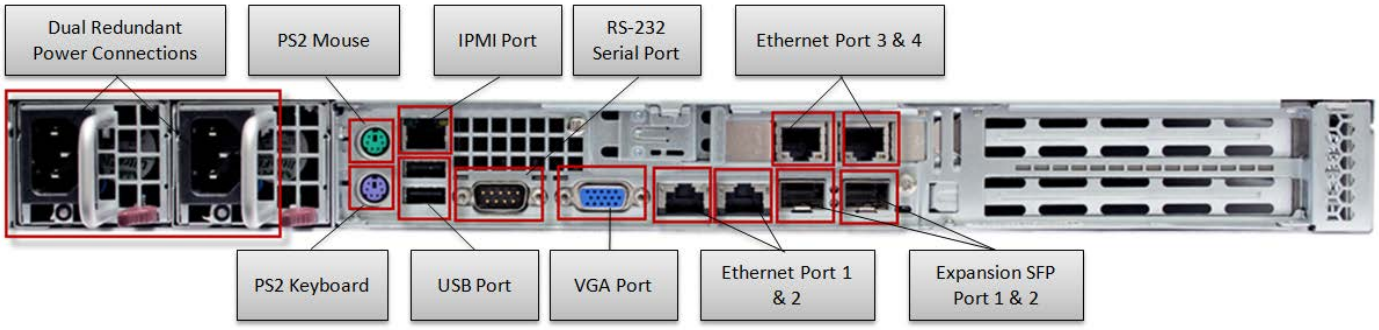

Figure 3-2: MAGNUM-HW (Generation 1) Connections - Front View

Rear:

- Dual Redundant Power Connections
- PS2 Mouse
- PS2 Keyboard
- IPMI Port
- USB Port
- USB Port
- RS-232 Serial Port
- VGA Port
- Ethernet Port 1
- Ethernet Port 2
- Ethernet Port 3
- Ethernet Port 4
- Expansion SFP Port 1
- Expansion SFP Port 2

4. SPECIFICATION (GENERATION 2)

Chassis:

- Form Factor
- 1U Rackmount

Dimensions:

- Height 1.7" (43mm)
- Width 17.2" (437mm)
- Depth 26.6" (676mm)
- Gross Weight 43 lbs (19.45 kg)

Front Panel:

- Buttons
    - Power On/Off Button
    - System Reset Button
    - UID Button

LEDs:

- Power LED
- Hard drive activity LED
- 2x Network activity LEDs
- System Overheat LED
- Universal Information (UID) LED

System Cooling:

- 5x Cooling Fans
- 1x Air Shroud

Power Supply:

- 700W AC-DC high-efficiency power supply with PMBus and I2C
- AC Input: 700W: 100-140 V, 50-60 Hz, 8.5-6 Amp
- DC Output +5V standby: 3 Amp
- DC Output +12V: 58 Amp @ 100-140V

Environmental:

- Operating Temperature: 10° to 35°C (50° to 95°F)
- Non-operating Temperature: -40° to 70°C (-40° to 158°F)
- Operating Relative Humidity: 8% to 90% (non-condensing)
- Non-operating Relative Humidity: 5 to 95% (non-condensing)

LAN:

- 6x RJ45 LAN ports
- 2x SFP+ LAN port
- 1x RJ45 Dedicated IPMI LAN port

USB:

- 2x USB rear ports

VGA:

- 1x VGA Port

Keyboard / Mouse:

- PS/2 keyboard and mouse ports

5. CONNECTIONS (GENERATION 2)

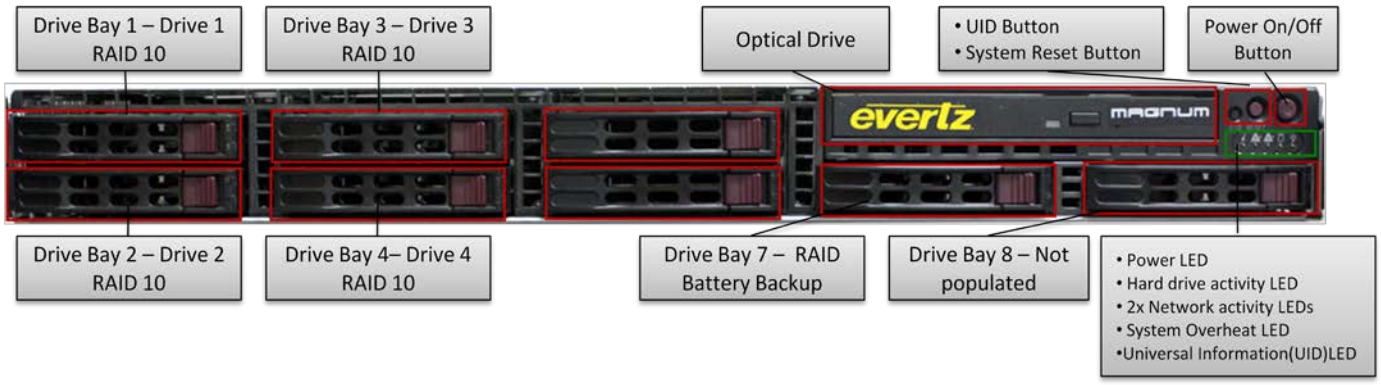

Figure 5-1: MAGNUM-HW (Generation 2) Connections - Front View

Front:

- Drive Bay 1 – Drive 1 RAID 10
- Drive Bay 2 – Drive 2 RAID 10
- Drive Bay 3 – Drive 3 RAID 10
- Drive Bay 4 – Drive 4 RAID 10
- Drive Bay 5 – Not populated
- Drive Bay 6 – Not populated
- Drive Bay 7 – RAID Battery Backup
- Drive Bay 8 – Not populated
- Optical Drive

Front Panel Buttons*:*

- Power On/Off Button
- System Reset Button
- UID Button

Front Panel Status:

- Power LED
- Hard drive activity LED
- 2x Network activity LEDs
- System Overheat LED
- Universal Information (UID) LED

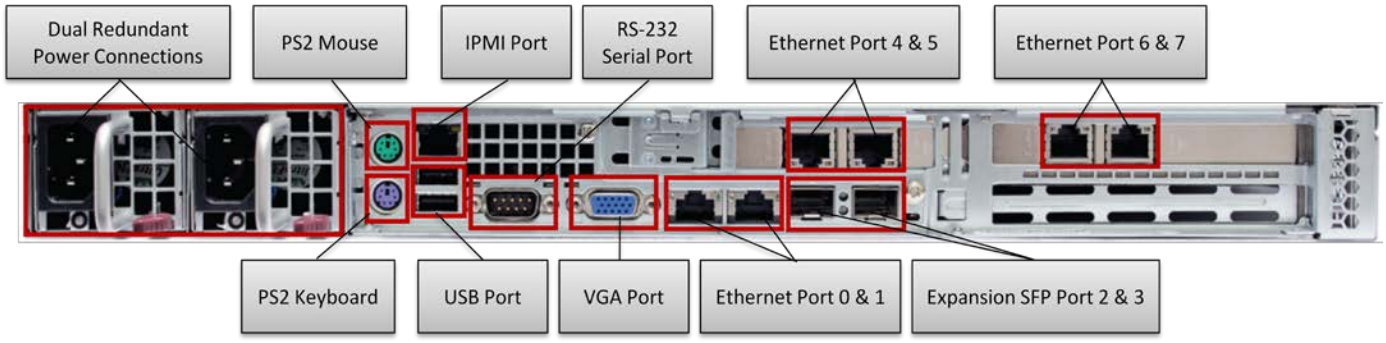

Figure 5-2: MAGNUM-HW (Generation 2) Connections - Rear View

Rear:

- Dual Redundant Power Connections
- PS2 Mouse
- PS2 Keyboard
- IPMI Port
- USB Port
- USB Port
- RS-232 Serial Port
- VGA Port
- Ethernet Port 0
- Ethernet Port 1
- Ethernet Port 4
- Ethernet Port 5
- Ethernet Port 6
- Ethernet Port 7
- Expansion SFP Port 1
- Expansion SFP Port 2

6. MAGNUM SERVER CONFIGURATION SHELL

The server control tool enables the user to set up the MAGNUM server parameters. Launching the MAGNUM Server Configuration tool will reveal a number of operations that can be performed in order to properly set up your server. For more detailed information on the MAGNUM Server Configuration Shell please refer to the MAGNUM manual. This section outlines the minimum configuration required.

Tip: Changes that affect the operation of the MAGNUM Server or admin level actions will cause an authentication prompt to be displayed.

To login to the MAGNUM Server Configuration Shell, the user will have to enter the following information at the login screen. The login screen is accessed by hitting “ctrl+alt+F2” to switch terminals. At the login prompt use the following default credentials.

- Enter *admin* as the username and then press <*enter*>
- Enter *admin* as the password and then press <*enter*>

Figure 6-1 displays the main setup menu. Section 6.1 to 6.3 will guide you through the process of setting up your server and identifying the function of each configuration tool.

You will use the arrow keys, tab, and enter keys to navigate through the MAGNUM Server Configuration Shell.

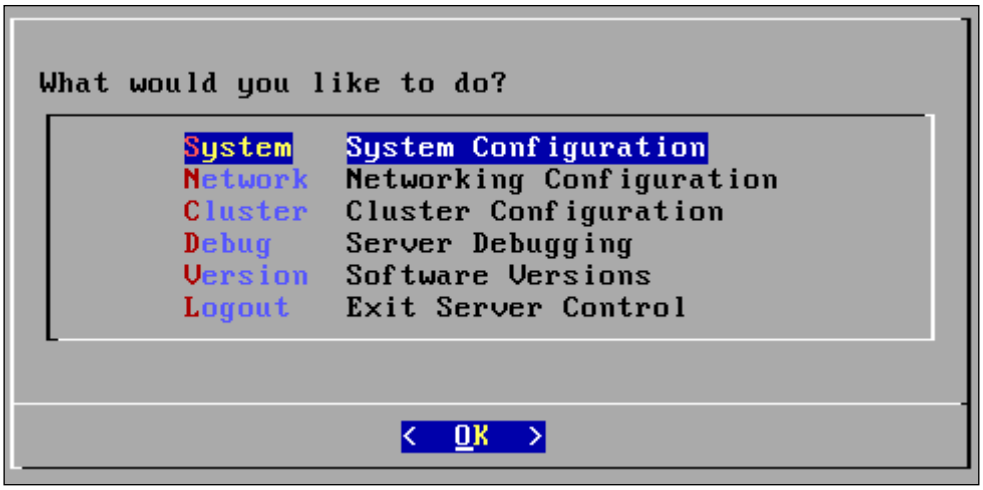

Figure 6-1: Main Server Control Menu

6.1. SYSTEM CONFIGURATION

Selecting the **System Configuration** option will reveal the screen displayed in Figure 6-2. The main function of the system configuration menu is to complete the set up of the server configuration. The System Configuration Menu allows the user to verify or change system level configuration, such as Date/Time, Hostname, etc; or to perform system level operations such as changing the admin password, upgrading, rebooting, etc.

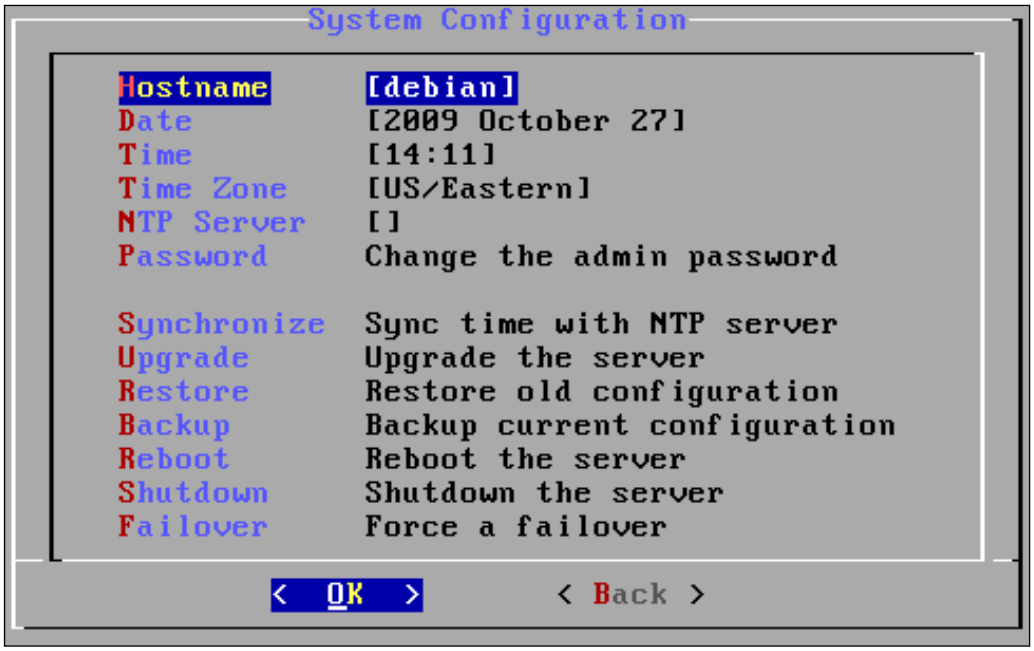

Figure 6-2: System Configuration Menu

6.1.1. Setting the Host Name

Selecting the **Hostname** option from the System Configuration menu will enable the user to set the host name for the server. The dialog box in Figure 6-3 will appear when this option is selected. The user will be prompted to enter the desired name for the host into the "S*et current host name:*" field. This name was set during initial installation but can be changed using this menu option.

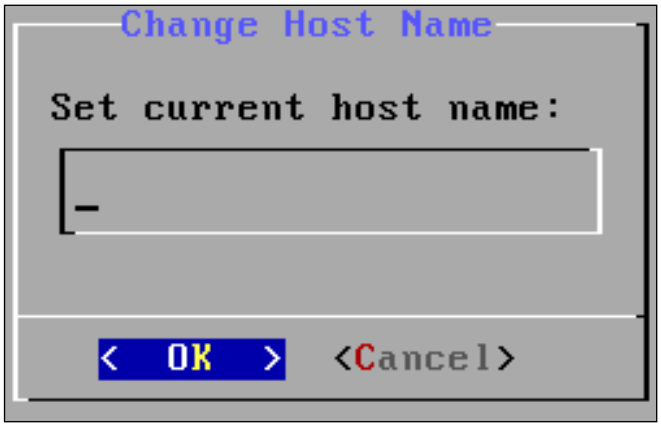

Figure 6-3: Change Host Name

6.1.2. Setting the Server Date

Selecting **Date** from the System Configuration menu will enable the user to set the date for which the server will reference. Select the current day, month and year from the calendar identified in Figure 6-4.

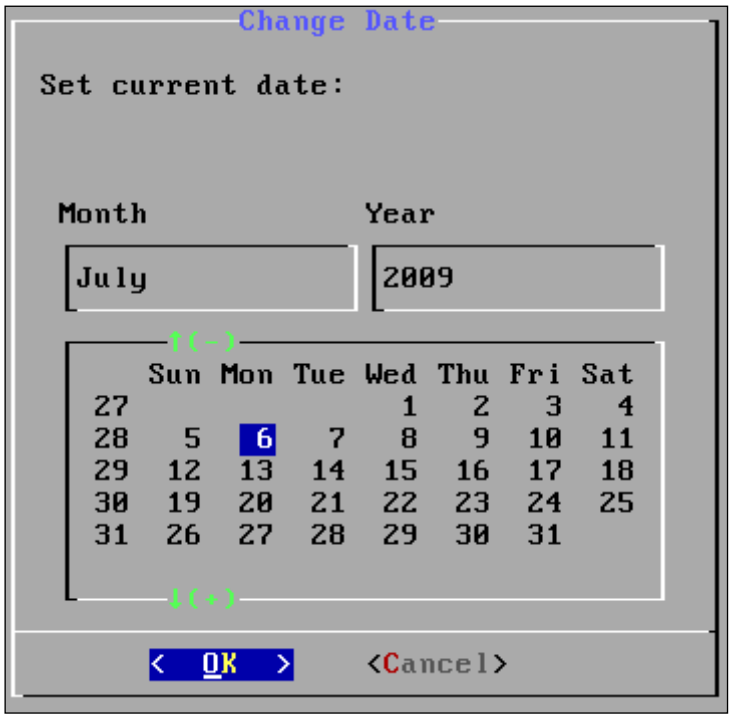

Figure 6-4: Change Date

6.1.3. Setting the Server Time

Selecting **Time** from the System Configuration menu will enable you to set the current time for which the server will reference. Select the hour, minute and second identified in the **Change Time** dialog box as shown in Figure 6-5. Use the up and down arrow keys to set the values and tab to switch boxes.

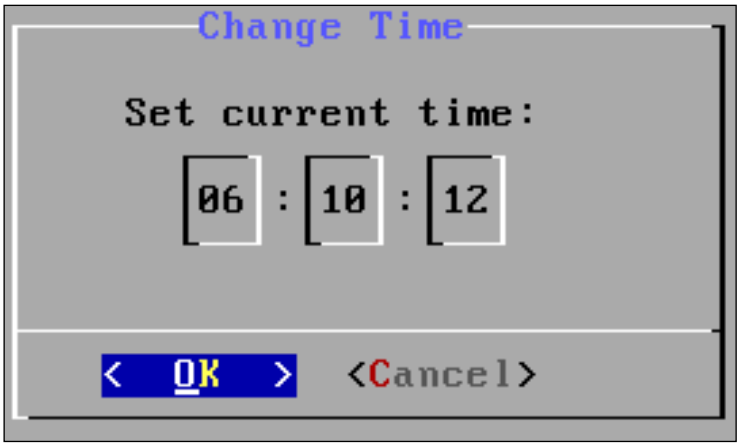

Figure 6-5: Change Time

6.1.4. Setting the Server Time Zone

Selecting **Time Zone** from the System Configuration menu will enable you to set the current time zone for the region you are in. Toggle through the list of countries and zones to select your region. Refer to Figure 6-6.

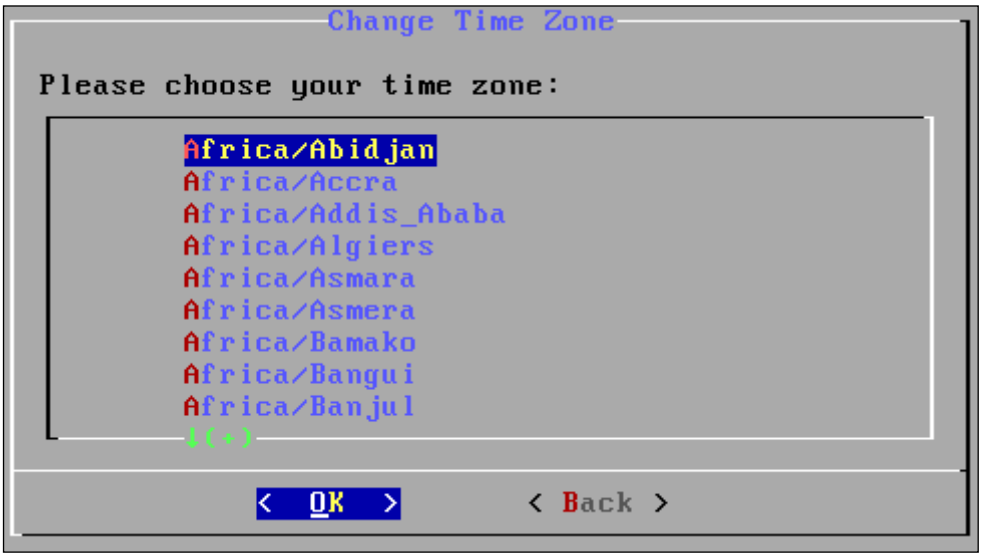

Figure 6-6: Change Time Zone

6.2. NETWORKING CONFIGURATION

The **Networking Configuration** menu will enable the user to set the network information (IP, Netmask, Gateway, and Broadcast).

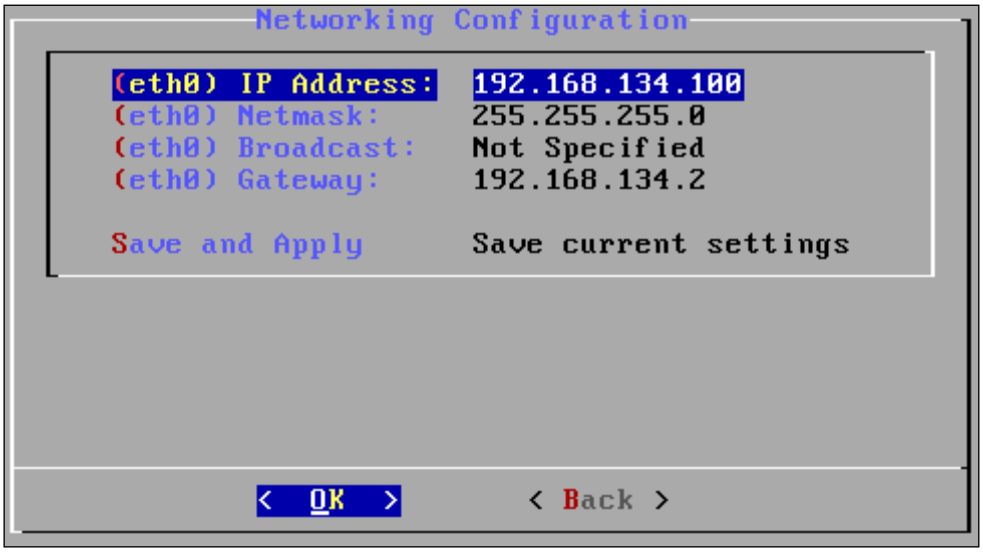

Figure 6-7: Network Configuration Menu

6.2.1. Assigning an IP Address for eth1

To assign an IP Address, select the **(eth1) IP Address** option from the Networking Configuration menu. The dialog box in Figure 6-8 will appear when this option is selected. The user will be prompted to enter the desired IP address into the "New IP address for eth1" field and then select the **OK** button. Please note that the settings must be saved using the **Save and Apply** option from the Networking Configuration menu. Please note that DHCP is NOT recommended at any time.

Figure 6-8: Enter New IP Address for eth1

6.2.2. Assigning a Subnet Mask for eth1

To assign a subnet mask for eth1, select the **(eth1) Netmask** option from the Networking Configuration menu. The dialog box in Figure 6-9 will appear when this option is selected. The user will be prompted to enter the desired subnet mask into the "New subnet mask for eth1" field and then select the **OK** button. Please note that the settings must be saved using the **Save and Apply** option from the Networking Configuration menu.

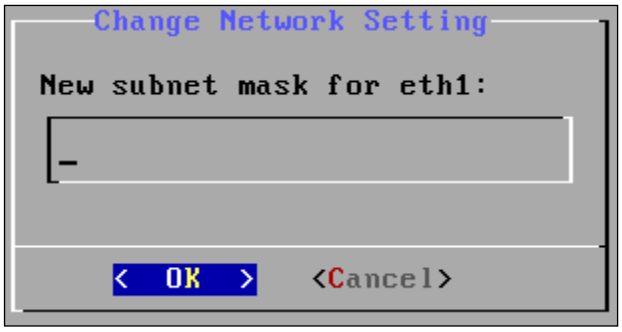

Figure 6-9: Enter New Subnet Mask for eth1

6.2.3. Assigning a Gateway Address for eth1

To assign a gateway for eth1, select the **(eth1) Gateway** option from the Networking Configuration menu. The dialog box in Figure 6-10 will appear when this option is selected. The user will be prompted to enter the desired gateway into the "New gateway address for eth1" field and then select the **OK** button. Please note that the settings must be saved using the **Save and Apply** option from the Networking Configuration menu.

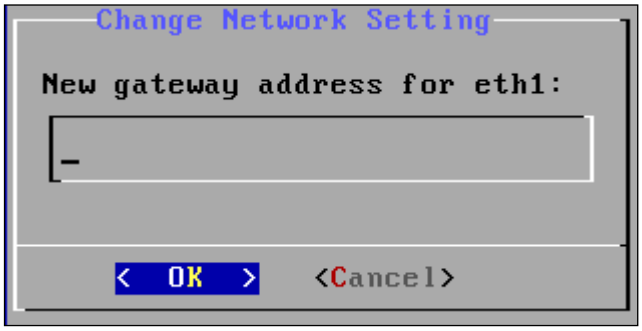

Figure 6-10: Enter New Gateway Address for eth1

6.2.4. Assigning a Broadcast Address for eth1

To assign a broadcast address for eth1, select the **(eth1) Broadcast** option from the Networking Configuration menu. The dialog box in Figure 6-11 will appear when this option is selected. The user will be prompted to enter the desired subnet mask into the "New broadcast address for eth1" field and then select the **OK** button. Please note that the settings must be saved using the **Save and Apply** option from the Networking Configuration menu.

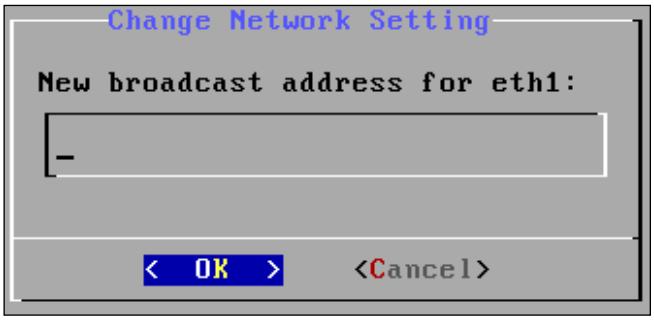

Figure 6-11: Enter New Broadcast Address for eth1

This page left intentionally blank

7. MAGNUM SERVER SERIAL HEARTBEAT

7.1. OVERVIEW

Some MAGNUM Server configurations use a serial heartbeat between the servers in the cluster to ensure that there is an active server in the cluster.

The serial heartbeat requires server hardware with a serial port, by default /dev/ttyS0.

7.2. TESTING THE SERIAL PORT ON A RUNNING SERVER

7.2.1. Using Configshell

From the Configshell login (Username: admin, Password admin), go to Debug > Cluster Status. The Cluster Status page will show the Serial and Ethernet Link Status. All Servers in the Cluster should report the status as UP for both Serial and Ethernet.

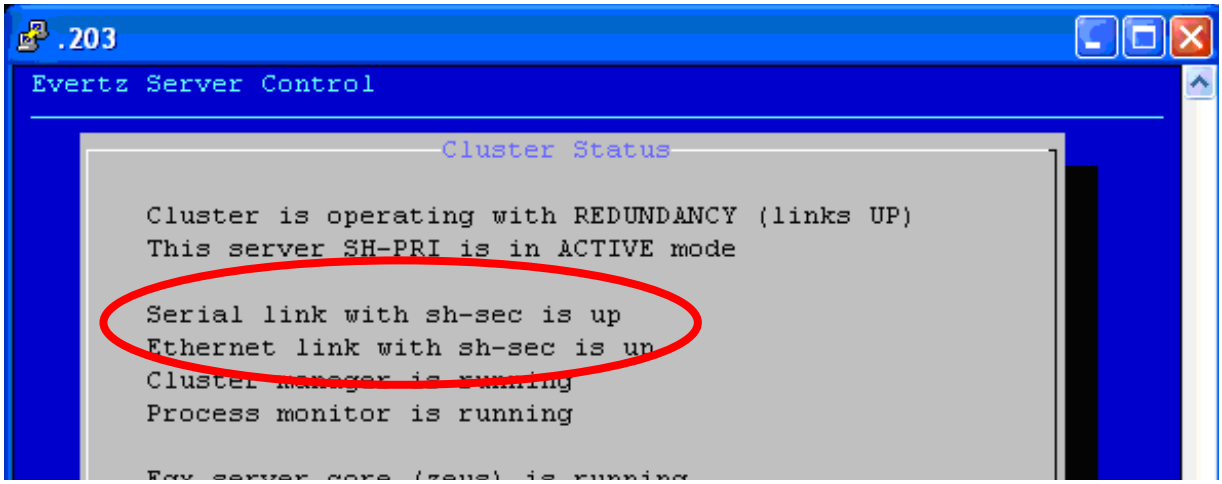

Figure 7-1: Serial and Ethernet Links

7.2.2. Using the Command Line

From the command prompt of a running server, use cat to view the contents of the /proc/tty/driver/serial file. The Serial info will show the number of packets transmitted and received by the serial port. On a server with the Heartbeat operating correctly you should see the tx and rx numbers increasing with each read.

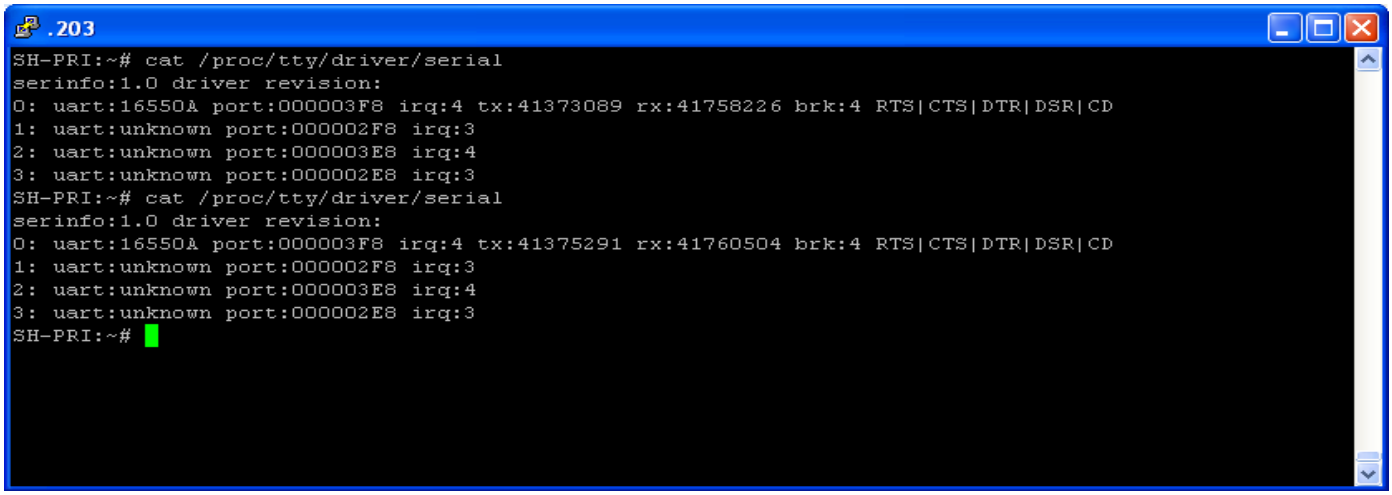

Figure 7-2: Command Line

7.3. SERIAL PORT CABLE

The null-modem serial port cable requires the CTS/RTS pins to be connected. A data-only (Tx/Rx/GND) cable will not work for the serial heartbeat. Most pre-made cables will work since they connect all required pins. For customers who wish to make their own cable, the following pinout has been proven in the field.

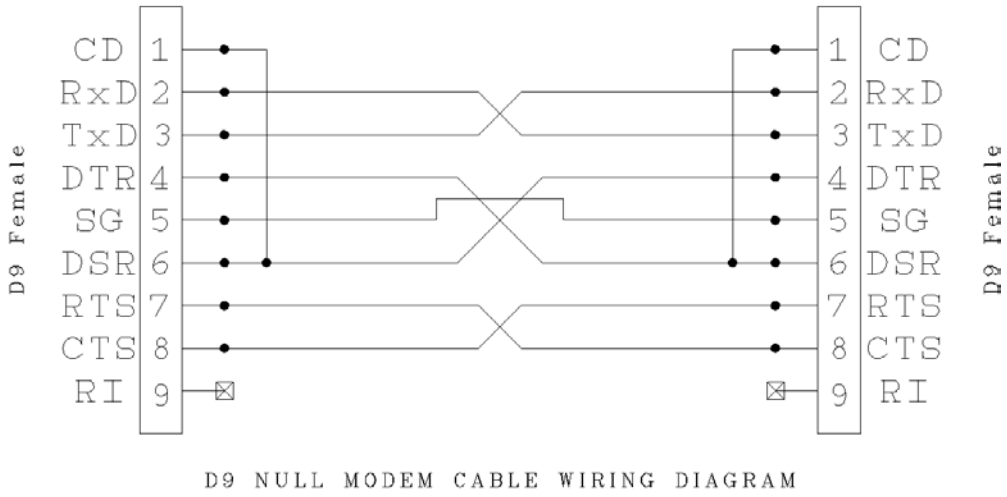

Figure 7-3: Null Modem Cable Wiring

8. APPENDIX

8.1. FAQ

- If the Magnum installer screen is not viewable, switch to other terminals back and forth. For example, [Ctrl] + [Alt] + [F2] will switch to the command line, and [Ctrl] + [Alt] + [F1] will switch back to the installer screen.

- After a clean shutdown from the USB stick, the USB stick must be physically removed from the server, then re-inserted, before the BIOS recognizes it as a potential boot device again.

- Removing the USB stick during installation, before the server is completely powered off, can corrupt the USB stick and prevent future installations from succeeding when using the same USB stick. If this occurs, recreate the Magnum Live Installation USB stick.

- To create the Magnum Live Installation USB stick, use LinuxLive USB Creator (version 2.8.18 or greater) available from http://www.linuxliveusb.com.

    1. Choose your USB key
    2. Choose the source to be the required ISO image.
    3. Change nothing for Persistence.
    4. Select ONLY “Format the key in FAT32”
    5. Click the lightning icon to start the installation

8.2. IPMI

8.2.1. IPMI Remote Access

1. Reboot the server by pressing the **Reset Button** (if the server is not rebooting already).

2. Press **<DELETE>** repeatedly while the BIOS displays the SuperMicro logo in Figure 8-1.

Figure 8-1: BIOS SuperMicro Logo

3. Navigate to **Advanced > IPMI Configuration > Set LAN Configuration**.

4. Set the **IP Address Source** to **Static**.

5. Set the **IP Address**, **Subnet** M**ask** and **Gateway Address** to ensure the PC can reach the server. *Never change the MAC Address.*

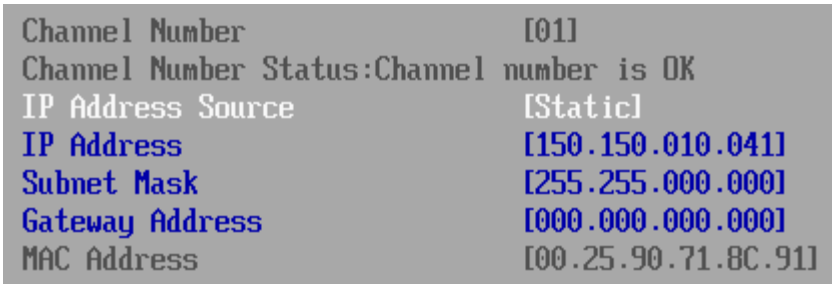

Figure 8-2: IPMI Configuration

6. Press **<F10>** to save the BIOS settings.
   When asked to save and exit as shown in Figure 8-3, select **OK** to power off the server.

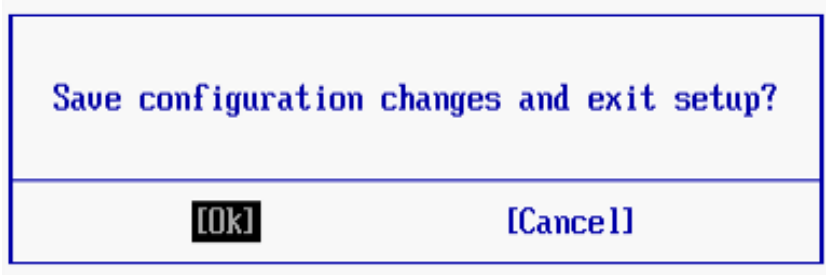

Figure 8-3: Save BIOS Settings

7. Disconnect all power cables for at least 10 seconds.

8. Plug an Ethernet cable into the IPMI Ethernet port highlighted in Figure 8-4.

Figure 8-4: IPMI Ethernet Port

9. Plug in all power cables and the server should power on automatically.

10. On the PC, point a web browser to the server's IPMI IP Address.

11. Login using the username **ADMIN** and password **ADMIN**.

12. The web page shown in Figure 8-5 should appear.

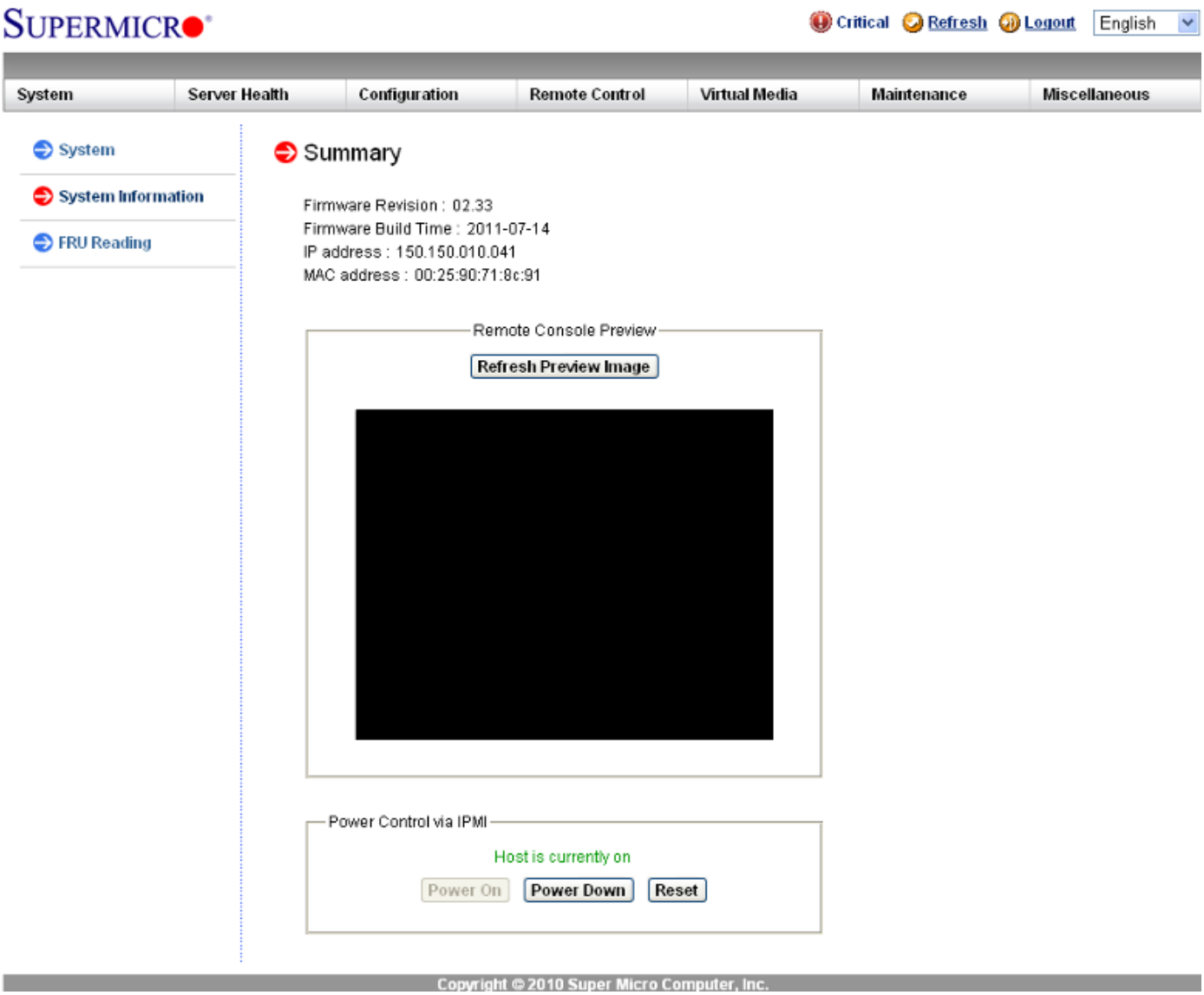

Figure 8-5: IPMI Web Page

13. Navigate to **Miscellaneous > UID Control**. Select **TURN ON**. Click **Save** then click **OK**.

14. The leftmost UID LED under the power buttons should be blinking Blue.

15. Select **TURN OFF**. Click **Save** then click **OK**.

16. Reboot the server by pressing the **Reset Button**. Press **<DELETE>** repeatedly while the BIOS displays the SuperMicro logo.

17. Navigate to **Advanced > IPMI Configuration > Set LAN Configuration**. Set the IP Address to **000.000.000.000** to prevent IP conflicts.

8.3. DRIVE SWAPPING – HOW TO REPLACE A FAILED DRIVE

This procedure is designed for only using new clear drives.

8.3.1. Overview

Magnum HW (Generation 1) uses RAID 1 and Raid 10, pairs are in columns so 1,2 (RAID 1) 3,4 and 5,6 (RAID 10).

There are 3 HDD types in the in the field.

- 150 GB WD VelociRaptor
- 160 GB Seagate
- 250 GB Seagate

Important to note that in this RAID you can on replace a drive with one that is equal or greater in size, for field replacements Evertz is able to provide the following HDDs.

- 150 GB WD VelociRaptor
- 250 GB Seagate

Magnum HW (Generation 2) uses raid 10, pairs are in columns so 1,2 and 3,4.

8.3.2. Replacing a Failed Drive Notes:

1. Only insert a drive with the RAID configuration CLEARED.
2. Replace a failed drive only while the server is running
    A. The drive will rebuild automatically
3. If a drive does not rebuild automatically, the drive is not clear.
    A. If inserting a drive from a different server, during reboot, select “Clear”.
    B. If inserting a drive from the same server, during reboot, select “Import Foreign Configuration
4. Red light will blink while the drive is rebuilding
5. Powering off the server will cause rebuilding to restart.
6. If necessary remove failed drive from tray and replace with new drive.
7. The server will not boot without manual intervention if the drive is inserted while powered off.
    A. Only insert the new drive while the server is running.