NSE316 SAS-JBOD

OPERATING INSTRUCTION

15-4124-02A

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Table of Content

1. KEY FEATURES

1.1 System Features:

- Native SAS environment offers high data integrity and availability
- Support 16 hot-swap SAS/ SATA II 3Gb/s HDDs
- Auto-negotiate speeds between 1.5G and 3.0 Gbps
- Easy system maintenance with modular FRU design
- Supports SSP, SMP, and STP target and initiator
- Supports up to 16TB with SATA II HDD / 6.4TB with SAS 15K HDDs
- Supports staggered HDD spin-up
- Dual hot swappable / redundant power supply modules
- SIM (SAS I/O Module) built with latest Expander ASIC – Modular FRU
- Easy in-field firmware maintenance / upgrade:
  - Standard: via Mini-SAS interface
- 3 X high-speed external Mini-SAS (SFF-8088) interface
- Choice for setting up external ports:
  - One “IN” port (from HOST) + two “OUT” daisy chain
- Scalability: - Daisy Chain / Cascade to next / added JBOD
  - Seamless storage expansion for growing data demand
- Auto Alert for HDDs, Fan, Over-temperature, and Power Supply Failure
- GUI Interface (HOST side) supporting major SAS RAID controller cards (LSI MegaRAID 8888ELP)
- Reliable, cost-effective and energy-saving
- Supported RAID Controller:

RAID Controller	Model
L S I	MegaRAID 8888ELP MegaRAID 8880EM2
AMCC 3WARE	3Ware 9690SA-8E 3Ware 9690SA-414E
ADAPTEC	5 Series
ARECA	1680 Series

1.2 Enclosure Management Function

- Enclosure management thru In-band SES (SFF-8088)
- HDD Power-On, Activity, Failure/ Locate/ Identify LED Indicator on each drive bay
- Remote management (Event / E-mail Notification) ready with major controller manufacturers – Easy maintenance through RAID controller / HBA's GUI
- Temperature sensing / notification
- Smart Fan Features:
  - Status report by RAID Controller GUI
  - Variable fan speed for best thermal and acoustic performance
- PSU module:
  - Status report by RAID Controller GUI
  - Hot-swappable and redundant
- Audio Alert / LED indicator for failure events
  - Fan / Over-temperature / PSU / Under voltage / Over voltage.

2. ENCLOSURE DESCRIPTION.

2.1 The Front Panel View of NSE316 SAS JBOD Unit

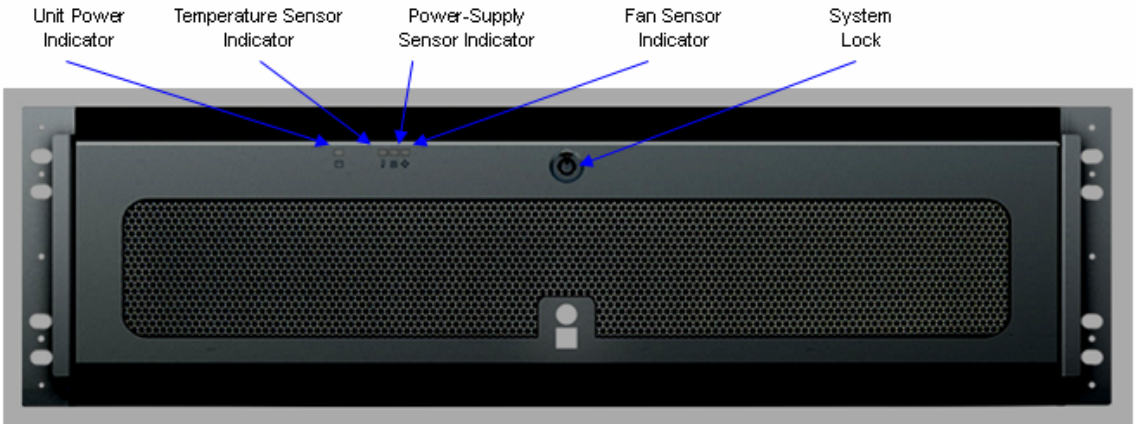

Figure 1 NSE316 SAS-JBOD Front Panel

Unit Power Indicator	: Indicate the Enclosure Power Status: On or Off
Temperature Sensor Indicator	: Indicate the temperature status on backplane board inside enclosure
Power Supply Sensor Indicator	: Indicate the enclosure power supply status
Fan Sensor Indicator	: Indicate the Fan Operation status
System Lock	: The lock secures the drive modules in the unit.

Opening The Front Door

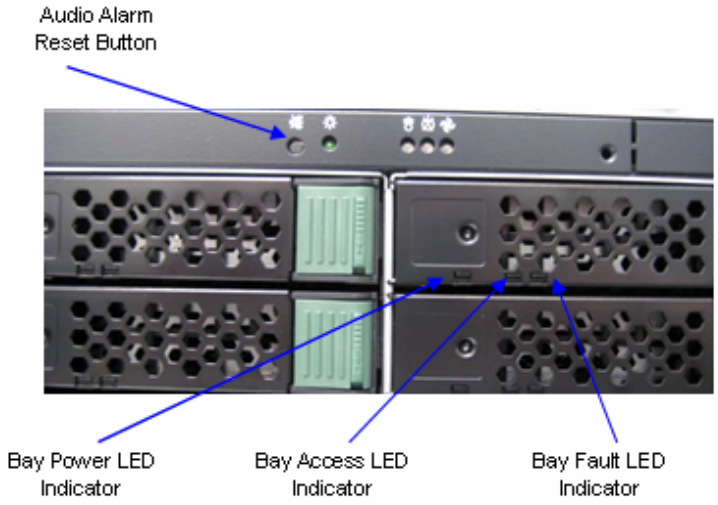

Figure 2 NSE316 SAS-JBOD Front View on Open Door

HDD ID NUMBER SEQUENCE

Figure 3 HDD ID Number Sequence

NOTE

If there is no HDD engaged inside a bay, all the LED on that bay are Off.

2.2 The REAR Panel View of NSE316 SAS JBOD Unit

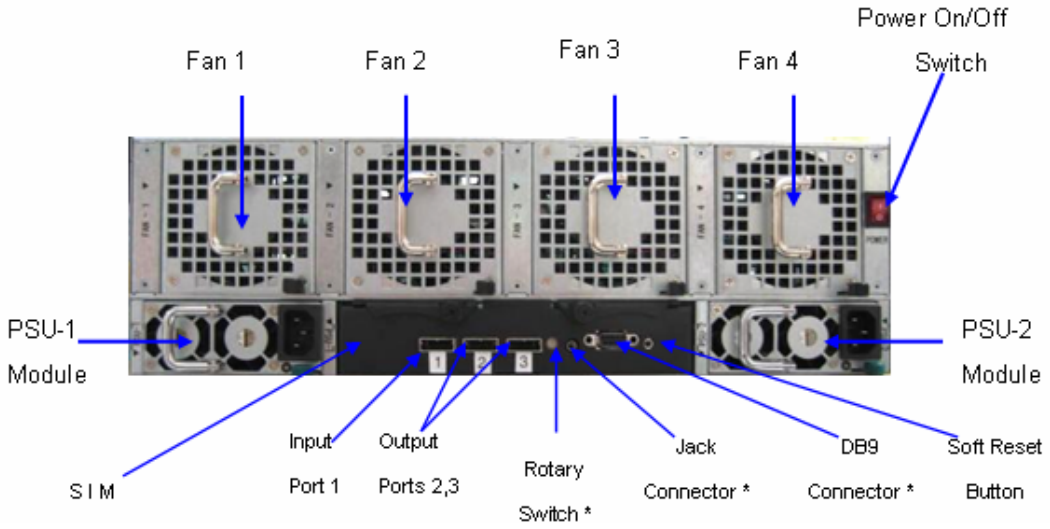

Figure 4 Rear Panel View

Power On/ Off Switch	: The Switch to turn On / Off the system
Fan 1,2,3,4	: Redundant, hot swappable Fan Modules
PSU -1, -2	: Redundant, hot swappable Power Supply Modules
S I M	: SAS I/O Module
Port 1	: Input Port, connect to Host Computer or input port from other Daisy-Chain unit.
Port 2, Port 3(default)	: Output Ports, for Daisy Chain additional Enclosures
DB9 Connector	: For Debugging and future FW upgrade
Soft Reset Button	: Re-sync communication between HDD and Host Reset Enclosure Management Monitoring Status.

Note:

* The Rotary Switch, Jack Connector and DB9 Connector are used for Ci Design internal / debugging purpose, customer does not need to access this interface in any case. If there is additional request, both sides will initiate OEM project based on customer's specific requirements.

3. EXTERNAL CONNECTION.

3.1 Single Enclosure:

- Connect the AC-cords to Power Supply 1 and Power Supply 2.
- Connect Port 1 to the RAID Controller Card on Host Computer using External MiniSAS Cable (SFF-8088).

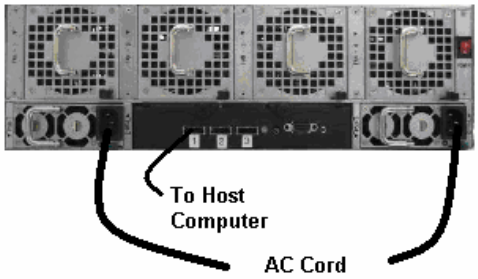

Figure 5 Single Enclosure External Connection

3.2 Daisy Chain Enclosure Assembly

- Connect the AC-cords to Power Supply 1 and Power Supply 2 of each enclosure.
- Connect Port 1 of the Enclosure 1 to the RAID Controller Card on Host Computer using External MiniSAS Cable (SFF-8088).
- Connect Port 2 of the Enclosure1 to Port 1 of the Enclosure 2 using Ext. MiniSAS Cable (SFF-8088).
- Connect Port 3 of the Enclosure1 to Port 1 of the Enclosure 3 using Ext. MiniSAS Cable (SFF-8088).
- Connect Port 2 of the Enclosure2 to Port 1 of the Enclosure 4 using Ext. MiniSAS Cable (SFF-8088).
- Connect Port 3 of the Enclosure2 to Port 1 of the Enclosure5 using Ext. MiniSAS Cable (SFF-8088).
- Connect Port 2 of the Enclosure3 to Port 1 of the Enclosure 6 using Ext. MiniSAS Cable (SFF-8088).
- Connect Port 3 of the Enclosure3 to Port 1 of the Enclosure 7 using Ext. MiniSAS Cable (SFF-8088).

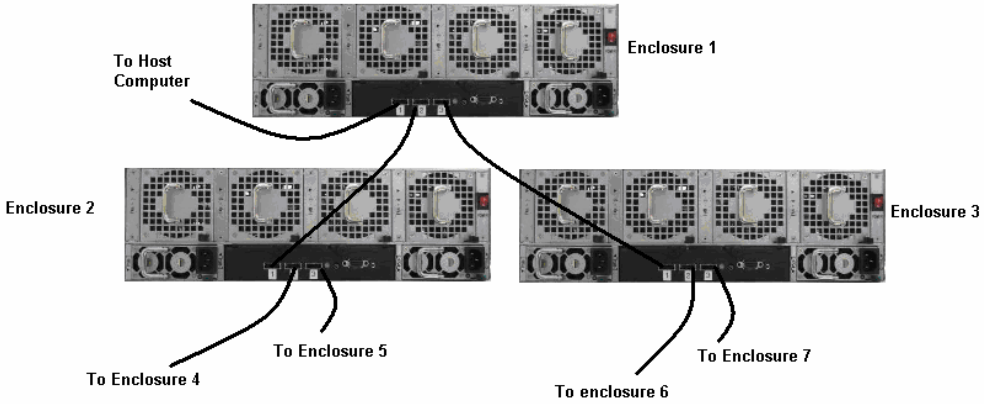

Figure 6 Daisy Chain of NSE316 SAS JBOD Enclosures

4. CONFIGURING THE UNIT

Considering system interoperability, we strongly recommend customer to use drives officially validated by Ci Design. Please refer to the following link:
http://www.cidesign.com/usa/hdd_compatibility.html

There are two ways of configuring the unit on the system:
- Using the Controller Card BIOS Configuration Utility
- Using the Controller Card G U I Storage Manager (Web-browser GUI)

Since G U I is much more versatile and user friendly, we are going to use the Storage Manager of the Controller Card to configure and also monitor the enclosure system.

4.1 Configuring the unit with LSI MegaRAID Storage Manager

Controller Card	Model	Storage Manager
L S I	MegaRAID 8888ELP MegaRAID 8880EM2	MegaRAID Storage Manager (v.2.65-00)

1. After inserting the enclosure with HDD and connect the necessary cables properly, power-up the enclosure.
2. Power up the Host Computer / Server and proceed to the Desktop Screen.
3. Open the MegaRAID Storage Manager, then the following screen will show-up:

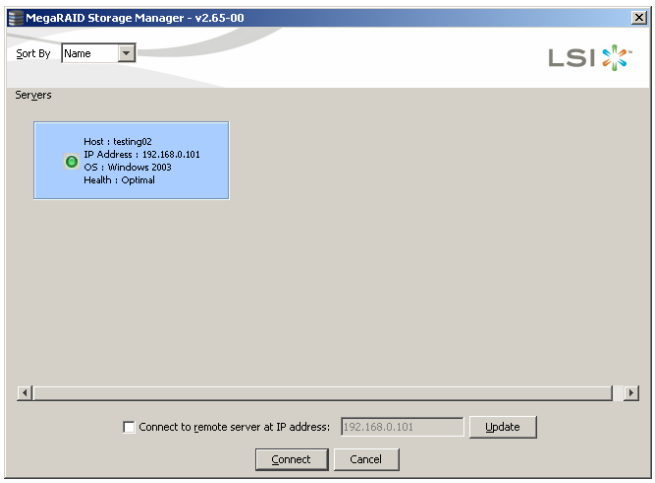

Figure 7 LSI MSM First Screen

4. Select CONNECT and the “Enter User Name and Password” window will come up.
5. Select LOGIN after entering the user name and password.
6. After successfully login, the following screen will come up:

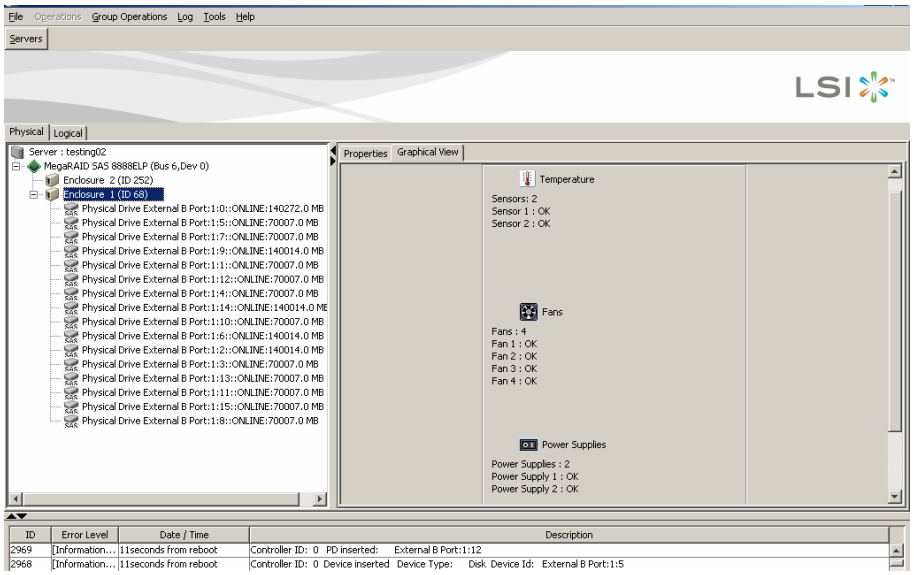

Figure 8 LSI MSM Graphical View

This screen can show the enclosures, the HDD detected by the computer.
Select / Highlight an enclosure. By clicking the GRAPHICAL VIEW Tab, it shows the monitoring condition / the status of Temperature Sensors, Fans, and Power Supplies on the highlighted enclosure. Please refer to the LSI MegaRAID Storage Manager Instruction Manual for more detail configuring instruction (create arrays, RAID, etc.).

7. After configuring the enclosure, the screen on the LOGICAL Tab will come up as follow:

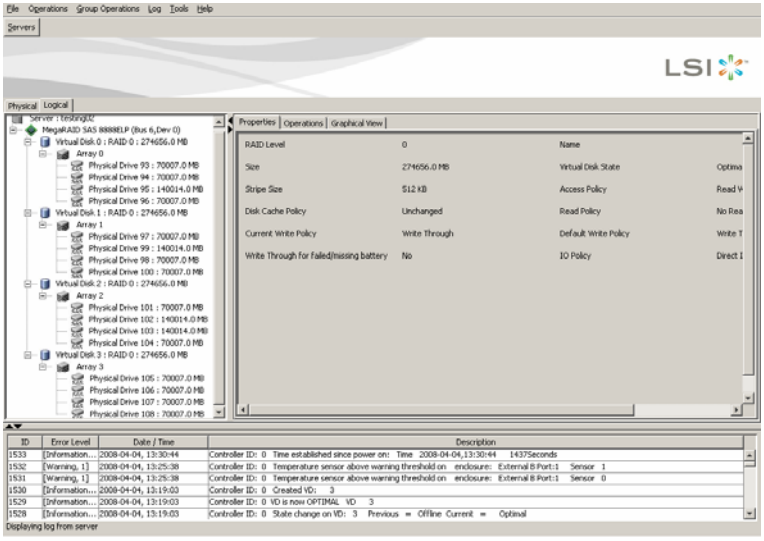

Figure 9 LSI MSM Logical View

4.2 Configuring the unit with 3WARE 3DM Storage Manager

Controller Card	Model	Storage Manager
AMCC 3Ware	3Ware 9690SA-8E 3Ware 9690SA-414E	3DM (version 2.08.00.07)

1. After inserting the enclosure with HDD and connect the necessary cables properly, power-up the enclosure.
2. Power up the Host Computer / Server and proceed to the Desktop Screen.
3. Open the 3Ware 3DM2 Storage Manager, then the following screen will show-up:

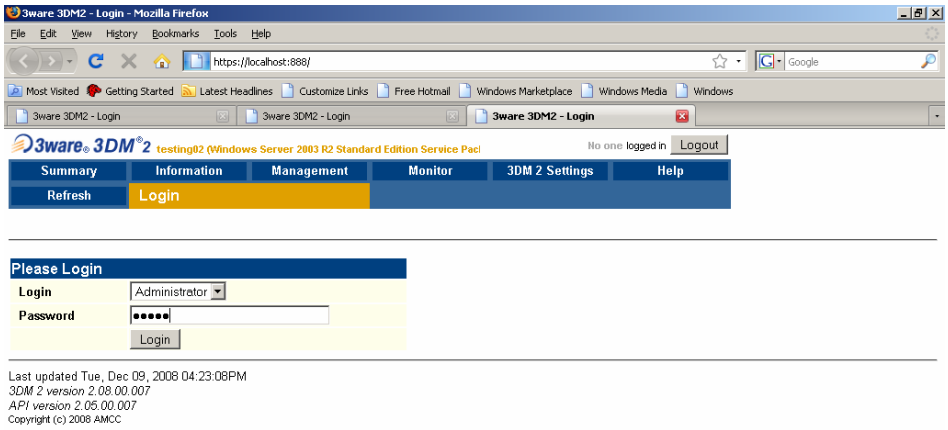

Figure 10 3DM Login Screen

4. Enter the User Name (Administrator) and the Password.
5. Click LOGIN, then the Opening Screen showing Controller Summary will come up.

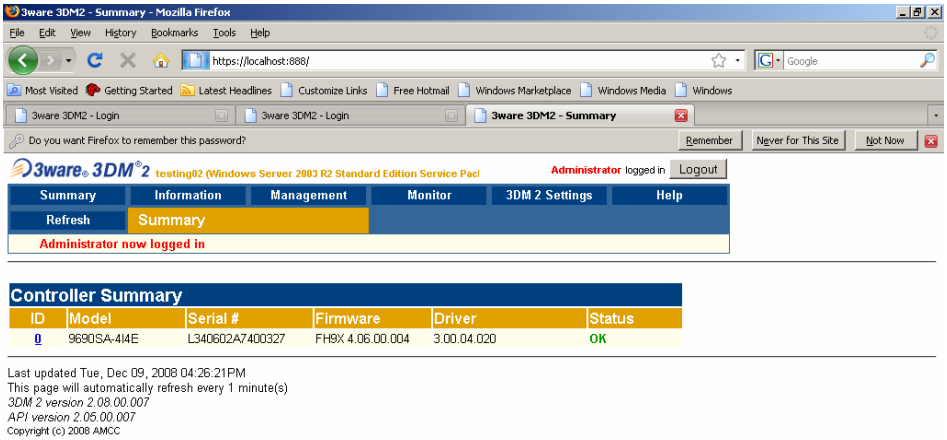

Figure 11 3DM2 Opening Screen

6. To view the condition of the enclosures, Click MONITOR, ENCLOSURE SUMMARY.

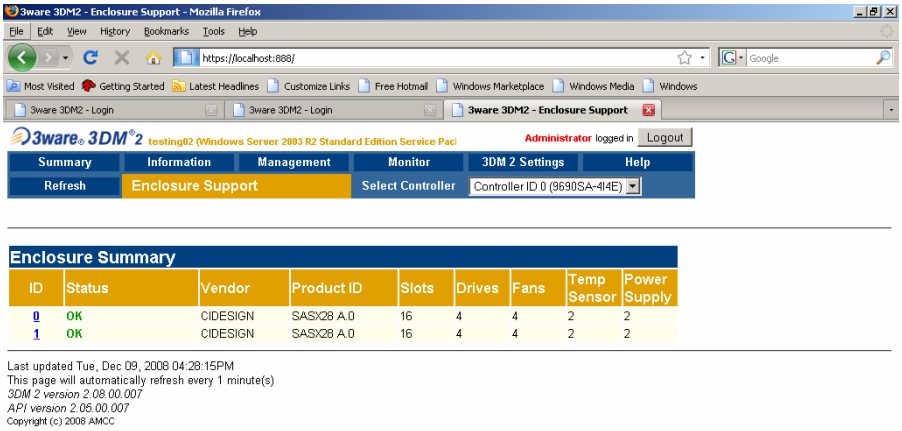

Figure 12 3DM2 Enclosure Summary Screen

7. Click the enclosure ID Number to view the detail information of an enclosure.

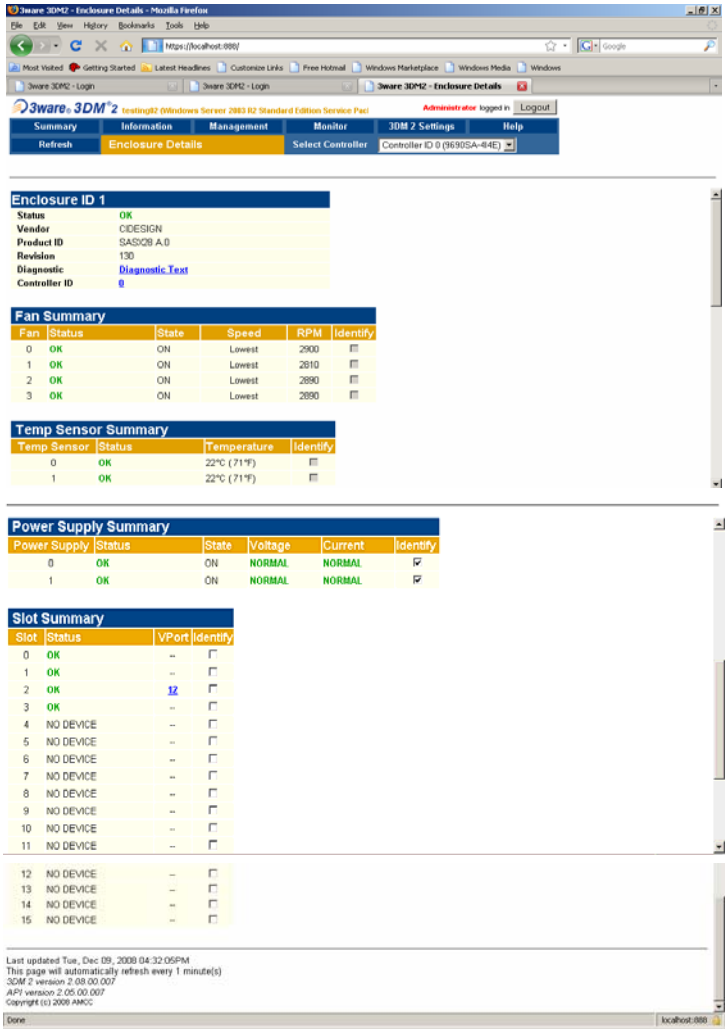

Figure 13 3DM2 Enclosure Detail Screen

8. To create array:
   - click MANAGEMENT, MAINTENANCE.
   - put a check-mark on the box next to the HDD you want to include in the array.
     Note: Do not mix the SAS HDD and SATA HDD on the same array.
   - click CREATE UNIT.

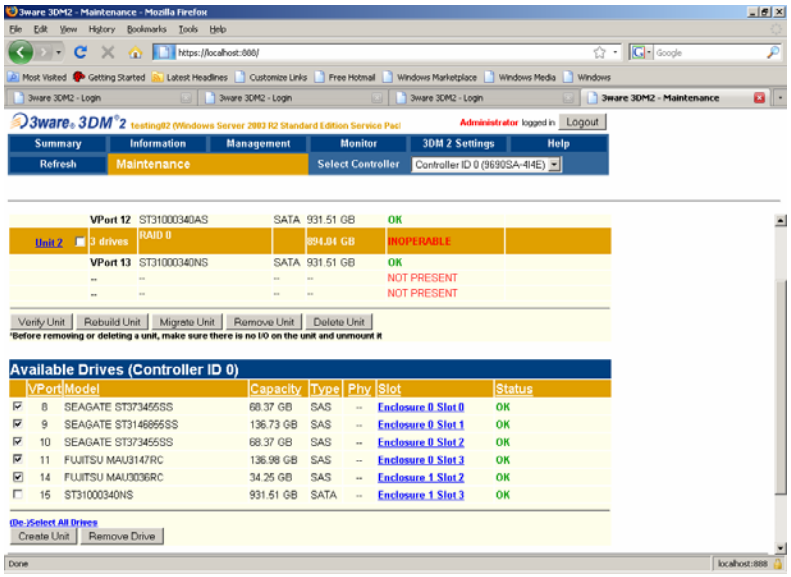

Figure 14 3DM2 Creating Array Screen

9. Set-up the RAID parameter.

10. After successfully creating the RAID configuration, the screen will show as follow:

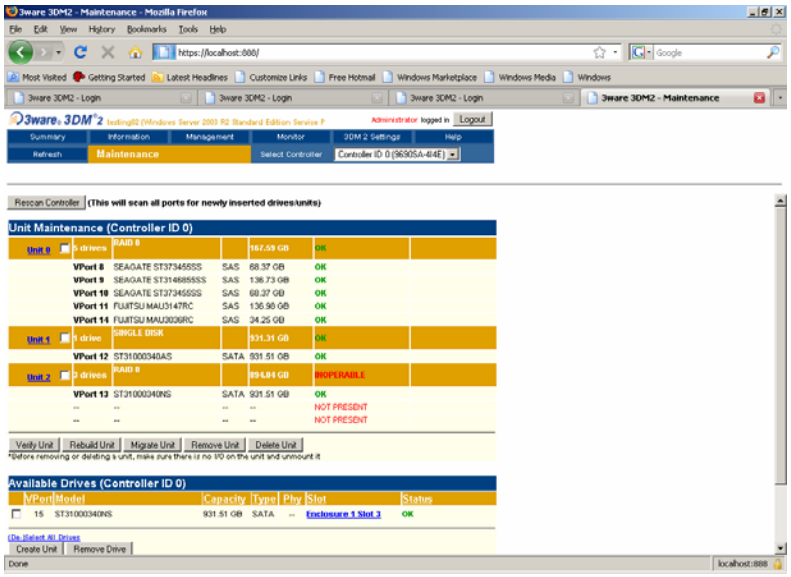

Figure 15 3DM2 Setting RAID Screen

4.3 Configuring the unit with Adaptec Storage Manager

Controller Card	Model	Storage Manager
ADAPTEC	5 Series	Adaptec Storage Manager (ver 6.00.00(17922))

1. After inserting the enclosure with HDD and connect the necessary cables properly, power-up the enclosure.
2. Power up the Host Computer / Server and proceed to the Desktop Screen.
3. Open the Adaptec Storage Manager, then the following screen will show-up:

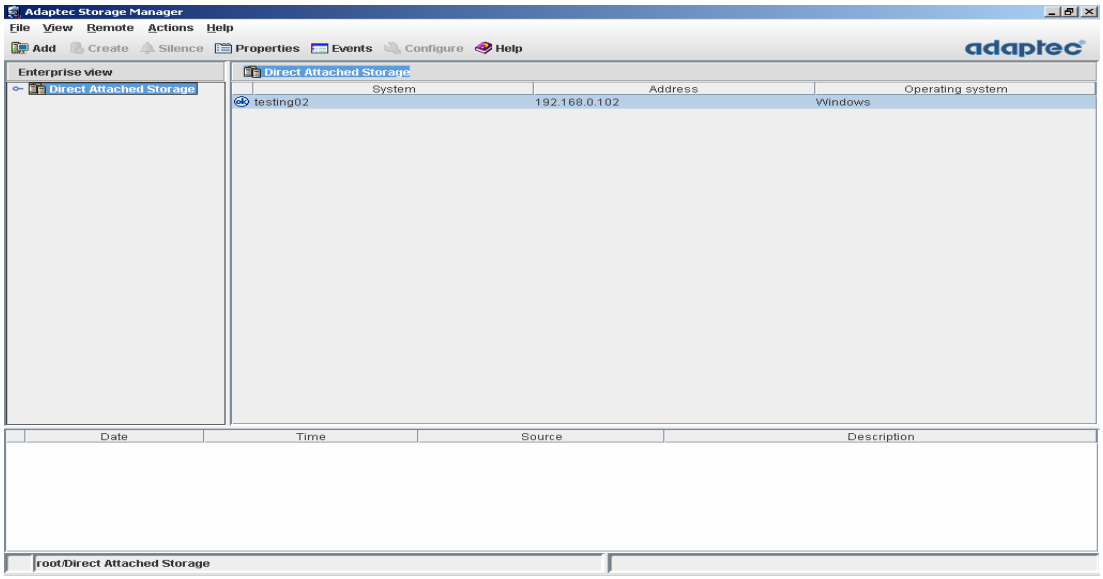

Figure 16 Adaptec Storage Manager Opening Screen

4. Double-click the Device listed on Direct Attach Storage Column (:"testing02"):

Figure 17 Adaptec Storage Manager Login

5. Enter the User Name, Password and then click CONNECT.

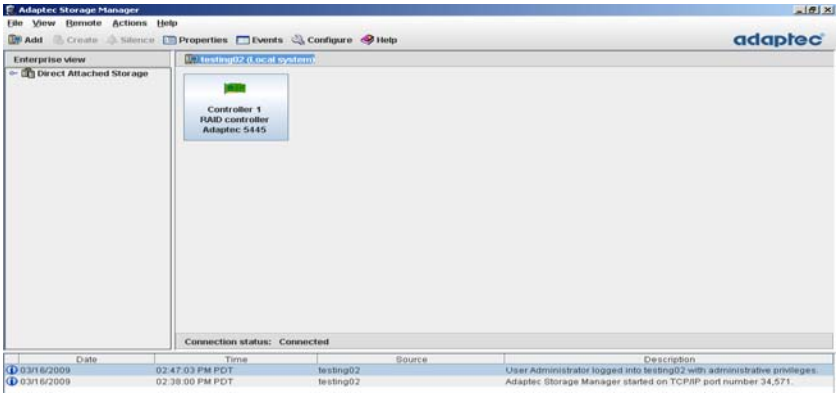

Figure 18 Adaptec Storage Manager Controller List

6. Double click the "Controller 1RAID Controller " icon of the Controller Card connected to the SASJBOD. The screen will show the enclosures connected to the card with their Physical HDD inside them.

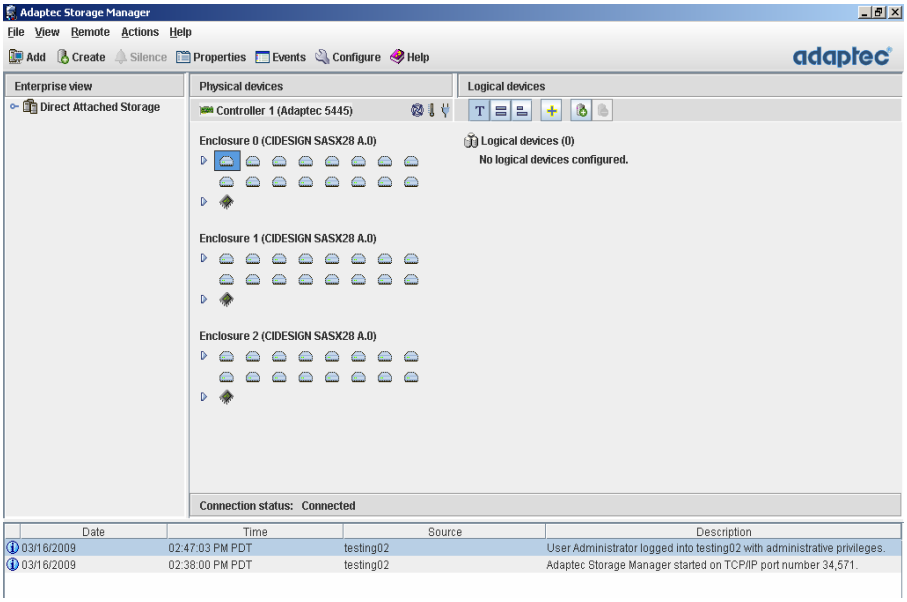

Figure 19 Adaptec Storage Manager Enclosure List

7. To know the status of an enclosure, double-click the “Enclosure Management Device" icon of the corresponding enclosure:

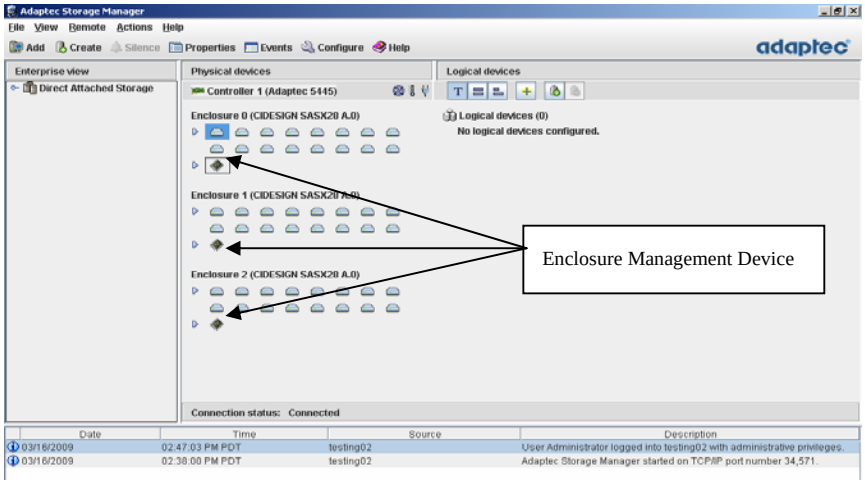

Figure 20 Adaptec Storage Manager Enclosure Management Device

8. Click the "Status" Tab and the properties window will show the status condition of each fan, power-supply module and temperature sensor of the enclosure.

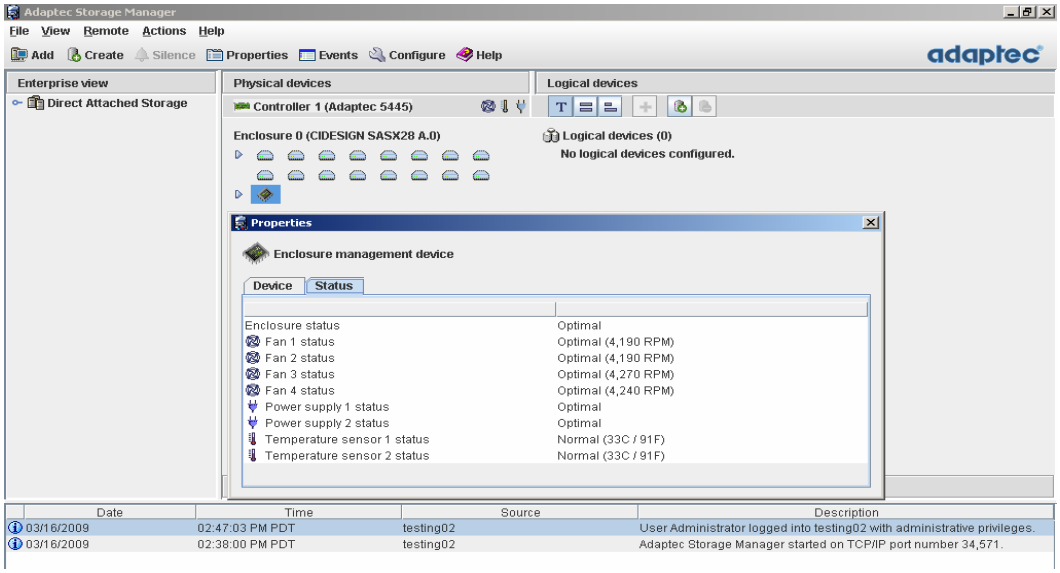

Figure 21 Adaptec Storage Manager Enclosure Management Device Status

9. To create RAID Array, click "CREATE", CUSTOM CONFIGURATION FOR CONTROLLER 1, click NEXT".

   Please follow the Adaptec Storage Manager Manual for more detail in configuring information.

4.4 Configuring the unit with Areca Storage Manager

Controller Card	Model	Storage Manager
ARECA	1680 Series	Areca HTTP proxy server GUI (Ver.1.00.000)

1. After inserting the enclosure with HDD and connect the necessary cables properly, power-up the enclosure.
2. Power up the Host Computer / Server and proceed to the Desktop Screen.
3. Open the Areca HTTP Proxy Server GUI, then the following screen will show-up:

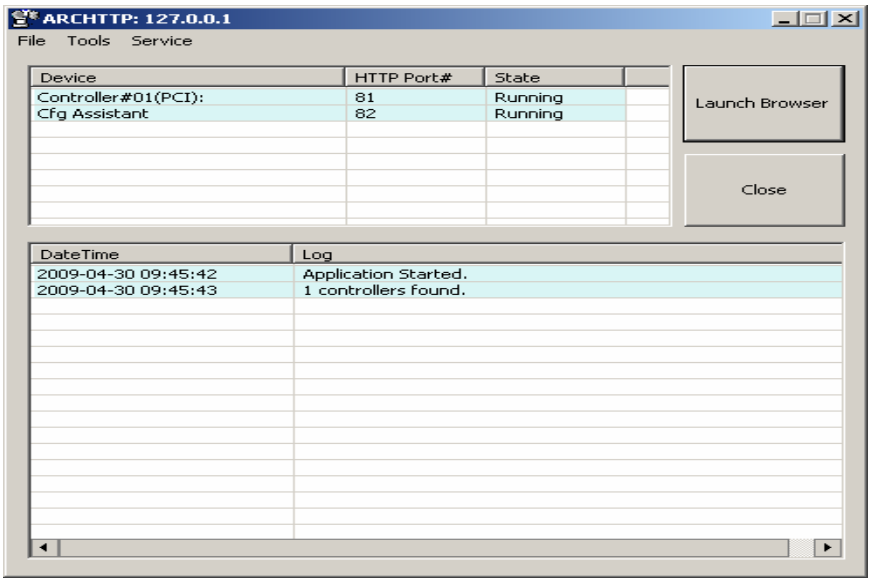

Figure 22 Areca HTTP Proxy Server GUI

4. On the Device List, double-click the controller where the SASJBOD Enclosure connected to (Controller #01).
5. Enter the User Name, Password then click OK.

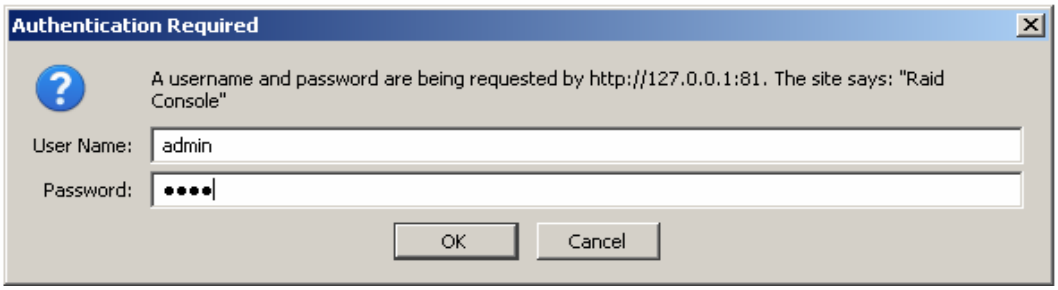

Figure 23 Areca HTTP Proxy Server GUI Login

6. The Monitor will show the Opening Screen as follow:

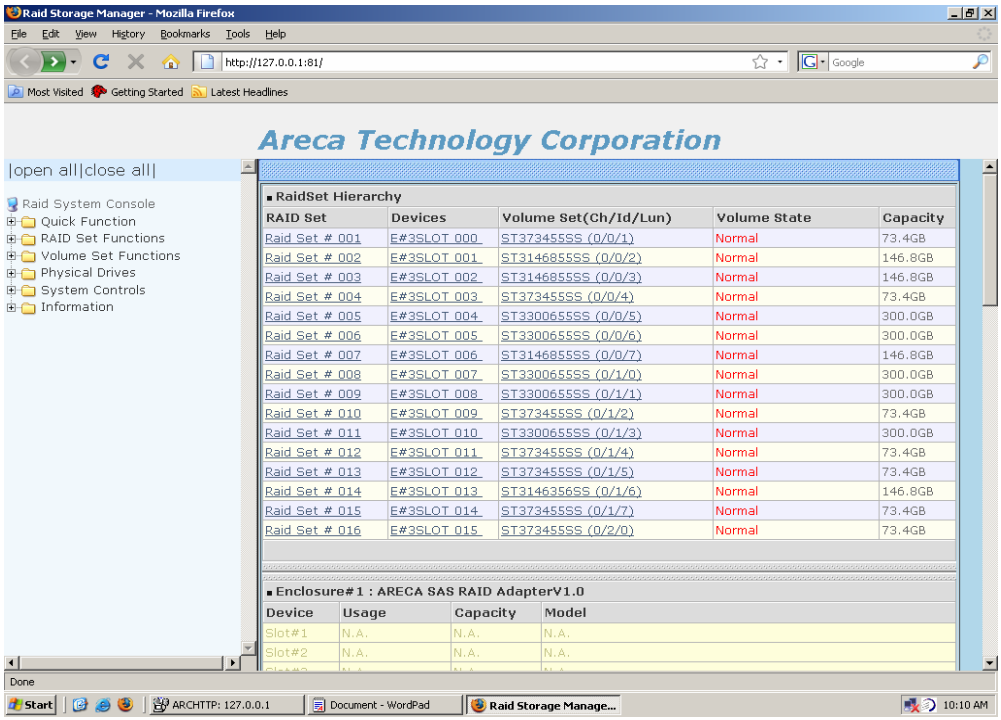

Figure 24 Areca GUI Opening Screen

7. To view the status or condition of the enclosure, click INFORMATION, HARDWARE MONITOR:

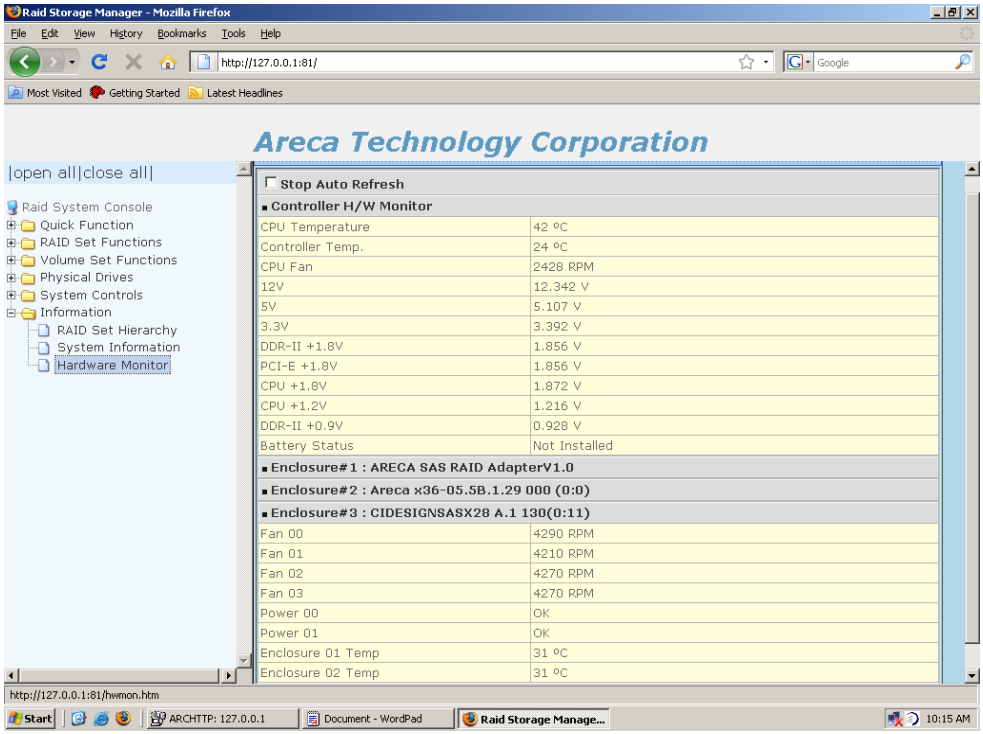

Figure 25 Areca GUI Enclosure Status Information

8. After setting the system configuration as RAID on System Control, the system can be further processed:
   a. Create Array : RAID SET FUNCTIONS, CREATE RAID SET
   b. Create RAID Volume Set : VOLUME SET FUNCTIONS, CREATE VOLUME SET
   etc.
   Please refer to the Areca HTTP Proxy Server GUI manual for more detail information.

5. NOTES

1. Before powering-up the unit, insert and engage at least 8 HDD on the bays of the unit.
2. During System boot-up:
   The Fail LED (Red Light) on all drive bays will be ON for short period of time then they will be OFF again.
3. The Monitoring System will generate an Update Notification if there a change from the Normal Operating Condition.
   In order to know the most update Monitoring Status of the enclosure (Fan, Temperature, Power Supply), it is recommended that the user Rescan / Refresh the condition of the unit. It may take a couple seconds for GUI to update the status. This delay response time depends on Bus Traffic Load with the Host Server.
4. On LSI MSM, the Status Report of Temperature Sensing:
   "Sensor 0" of Pop-up Window Notification corresponds to "Sensor 1" on Graphical View.
   "Sensor 1" of Pop-up Window Notification corresponds to "Sensor 2" on Graphical View.