Netberg J224 M3 JBOD

Netberg J224 M3 JBOD

Table of Contents

List of Figures

List of Tables

Chapter 1. Safety Information

1.1. Conventions

Several different typographic conventions are used throughout this manual. Refer to the following examples for common usage.

Bold type face denotes menu items, buttons and application names.

Italic type face denotes references to other sections, and the names of the folders, menus, programs, and files.

`<Enter>` type face denotes keyboard keys.

Warning information appears before the text it references and should not be ignored as the content may prevent damage to the device.

CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES, SIMILAR TO NOTES AND WARNINGS. CAUTIONS, HOWEVER, APPEAR IN CAPITAL LETTERS AND CONTAIN VITAL HEALTH AND SAFETY INFORMATION.

Indicates information that is important to know for the proper completion of a procedure, choice of an option, or completing a task.

Highlights general or useful information and tips.

1.2. Acronyms

Word	Definition
A/D	Analog to Digital
ACPI	Advanced Configuration and Power Interface
ASF	Alerting Standard Forum
Asserted	Active-high (positive true) signals are asserted when in the high electrical state (near power potential). Active-low (negative true) signals are asserted when in the low electrical state (near ground potential).
BIOS	Basic Input/Output System
BIST	Built-In Self Test
BMC	At the heart of the IPMI architecture is a microcontroller called the Baseboard management controller (BMC)
Bridge	Circuitry connecting one computer bus to another, allowing an agent on one to access the other
BSP	Bootstrap processor
Byte	8-bit quantity
CLI	Command Line Interface
CMOS	In terms of this specification, this describes the PC-AT compatible region of battery-backed 128 bytes of memory, which normally resides on the base-board
CPU	Central Processing Unit
Deasserted	A signal is deasserted when in the inactive state. Active-low signal names have "_L" appended to the end of the signal mnemonic. Active-high signal names have no "_L" suffix. To reduce confusion when referring to active-high and active-low signals, the terms one/zero, high/low, and true/false are not used when describing signal states.
DTC	Data Transfer Controller
EEPROM	Electrically Erasable Programmable Read-Only Memory
EMP	Emergency Management Port
FRU	Field Replaceable Unit
GB	1024 MB.
GPIO	General Purpose Input/Out
HSC	Hot-Swap Controller
Hz	Hertz (1 cycle/second)
I2C	Inter-Integrated Circuit bus
IANA	Internet Assigned Numbers Authority
IBF	Input buffer
ICH	I/O Controller Hub

Word	Definition
ICMB	Intelligent Chassis Management Bus
IERR	Internal Error
IP	Internet Protocol
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface
ITP	In-Target Probe
KB	1024 bytes.
KCS	Keyboard Controller Style
KVM	Keyboard, Video, Mouse
LAN	Local Area Network
LCD	Liquid Crystal Display
LCT	Lower Critical Threshold
LED	Light Emitting Diode
LNCT	Lower Non-Critical Threshold
LNRT	Lower Non-Recoverable Threshold
LPC	Low Pin Count
LSI	Large Scale Integration
LUN	Logical Unit Number
MAC	Media Access Control
MB	1024 KB
MD2	Message Digest 2 - Hashing Algorithm
MD5	Message Digest 5 - Hashing Algorithm - Higher Security
Ms	Milliseconds
Mux	Multiplexer
NIC	Network Interface Card
NMI	Nonmaskable Interrupt
NM	Node Management
OBF	Output buffer
OEM	Original Equipment Manufacturer
Ohm	Unit of electrical resistance
PDB	Power Distribution Board
PEF	Platform Event Filtering
PEP	Platform Event Paging
PERR	Parity Error
POH	Power-On Hours

Word	Definition
POST	Power-On Self Test
PWM	Pulse Width Modulation
RAC	Remote Access Card
RAM	Random Access Memory
RMCP	Remote Management Control Protocol
ROM	Read Only Memory
RTC	Real-Time Clock. Component of the chipset on the baseboard.
RTOS	Real Time Operation System
SCI	Serial Communication Interface
SDC	SCSI Daughter Card
SDR	Sensor Data Record
SEEPROM	Serial Electrically Erasable Programmable Read-Only Memory
SEL	System Event Log
SERR	System Error
SMBus	A two-wire interface based on the I2C protocol. The SMBus is a low-speed bus that provides positive addressing for devices, as well as bus arbitration
SMI	Server Management Interrupt. SMI is the highest priority nonmaskable interrupt
SMM	Server Management Mode
SMS	Server Management Software
SNMP	Simple Network Management Protocol
SOL	Serial Over LAN
UART	Universal Asynchronous Receiver/Transmitter
UCT	Upper Critical Threshold
UDP	User Datagram Protocol
UNCT	Upper Non-Critical Threshold
UNRT	Upper Non-Recoverable Threshold
WDT	Watchdog Timer
Word	16-bit quantity

1.3. Safety Information

1.3.1. Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions.

Warnings

Heed safety instructions: Before working with the server, whether using this manual or any other resource as a reference, pay close attention to the safety instructions. Adhere to the assembly instructions in this manual to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this manual. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in non-compliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before opening the chassis, adding, or removing any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground any unpainted metal surface on the server when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fingertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

1.4. Disclaimer

The information in this document is subject to change without notice. The manufacturer makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Furthermore, the manufacturer reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of the manufacturer to notify any person of such revision or changes.

For the latest information and updates please refer to www.netbergtw.com

All the illustrations in this technical guide are for reference only and are subject to change without prior notice.

Chapter 2. Introduction

This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing the JBOD chassis. This document provides an overview of the hardware features of the system, management information, and instructions on how to add and replace components of the JBOD.

The JBOD subsystem is a 19-inch 2U rackmount JBOD unit with optimized solutions for servers and external storage systems. It features the latest SAS 3.0 12Gb/s interface and designed to fit in with the environments which needed highly reliable and relentless data growth.

The JBOD subsystem incorporates the latest enhancements in SAS along with LSI DataBolt bandwidth optimizer technology (EDFB, End Device Frame Buffering). Using DataBolt, it delivers optimized throughput by allowing users to gain 12Gb/s host speeds with current-generation 6Gb/s drives. It is also a versatile SAS3 / SATA3 disk expansion system, ideal for high capacity and scalability storage in IT demands. It also supports dual JBOD controllers which provide better fault tolerance and higher reliability of system operation. The JBOD subsystem offers GUI management to monitor enclosure environmental conditions through a remote connection.

2.1. System Features

Table 2.1. J224 M3 Specifications

Hardware Features:	
Enclosure Form Factor	2U Rackmount
HDD Support	24x 12 or 6Gb/s 2.5" SAS Hot-Swap HDDs and SSDs
Host Interface/ per controller	3x 12Gb/s mini-SAS HD ports (1) RJ11 console port (1) RJ45 management port
Expansion Support	Scalable up to 144 Disk Drives: support 5 sets J224 M3 systems daisy chain (total 6 sets of J224 M3 systems)
Power supply	2x 300W redundant PSUs, input requirements 88 - 264V AC
Hot-Swap and Redundancy	
Controller Module	Dual hot-swappable controller modules
Disk Drives	Hot-swap HDDs (24-bay)
Cooling Fans	Total 1+1 redundant in the system, one fan in each power supply module
Physical Dimensions	
Dimensions, mm (H x W x D)	88 x 445 x 560
Weight	15 kg (without HDDs)
Environmental	
Operating temperature	10°C to 40°C
Humidity	20% to 85% relative humidity
Monitoring and Notification	• S.E.S. support for standard enclosure management • System LED indications • Fan speed monitoring • Power supply monitoring • System voltage monitoring • System temperature monitoring • System alarm

2.2. Package content

The J224 M3 box contains the following items:

1x J224 M3 JBOD unit

2x Power cord

2x 1m mini-SAS HD SFF-8644 cables

1x Universal Rail Kit

2x Ethernet LAN cables for dual JBOD controllers

2x serial cables for dual JBOD controllers

1x JBOD Controller Blanking Plate
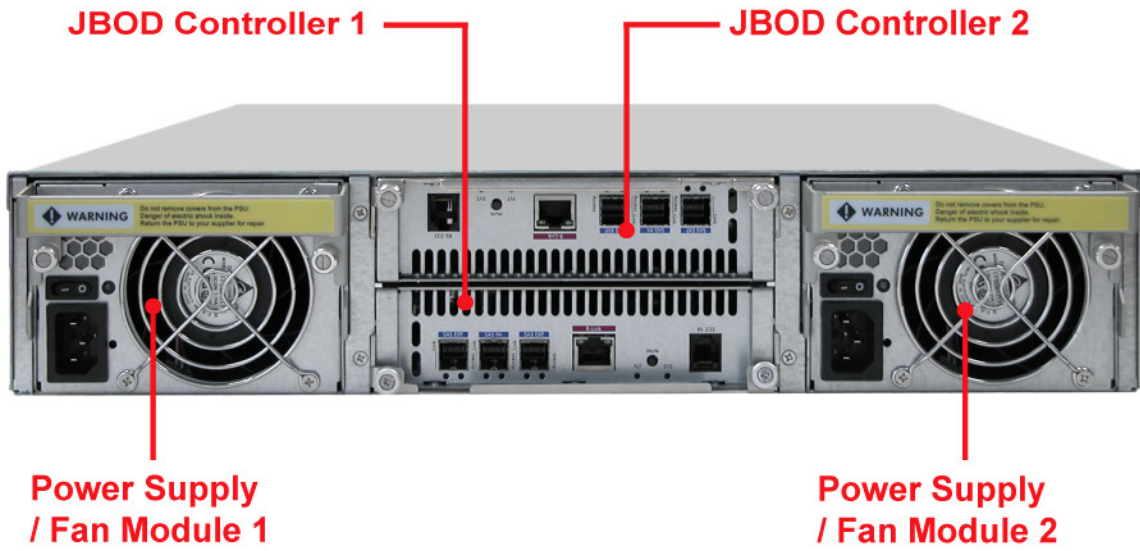
1x PSFM Blanking Plate

HDD Screws

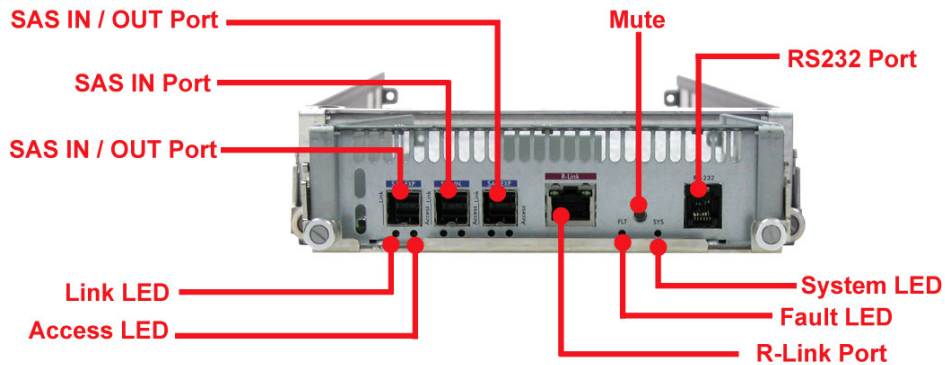# 2.3. Front View

Figure 2.1. System front view

2.4. Rear View

Figure 2.2. System rear view

2.5. JBOD Controller Module

Figure 2.3. JBOD Controller Panel

SAS IN/OUT Port can be flexibly configured as either SAS IN PORT or SAS OUT PORT by request

Item	Description
SAS IN Port	SAS cable must be connected to this port and to the SAS HBA, or other Expansion Chassis's SAS Expansion Port, if this chassis is connected in daisy-chain.
SAS OUT Port	SAS cable must be connected to these ports and to other SAS IN Port of other expansion chassis for daisy-chaining.
Link LED (SAS IN and SAS OUT)	Green indicates SAS IN/OUT Port has connected or linked.
Access LED (SAS IN and SAS OUT)	Blue indicates SAS IN/OUT Port is being accessed.
RS-232 Port	Used for upgrading the Firmware of JBOD controller in the Expansion Chassis.
Mute	Use this button to silence the alarm beeper. If another failure event happens, the alarm beeper will sound again and this button can be pressed again to silence alarm.
System LED	Green indicates Expansion Chassis is Powered On and Ready.
Fault LED	Red (LED is on) indicates there is problem within the Expansion Chassis. If LED is off, the Expansion Chassis is in normal condition.
R-Link Port	Use to connect to Telnet for upgrading the Firmware of JBOD controller

2.6. Power Supply / Fan Module (PSFM)

The JBOD subsystem contains two 300W Power Supply / Fan Modules. All PSFMs are inserted into the rear of the chassis.

Figure 2.4. PSFM Panel

Power On/Fail Indicator

Power On/Off Switch
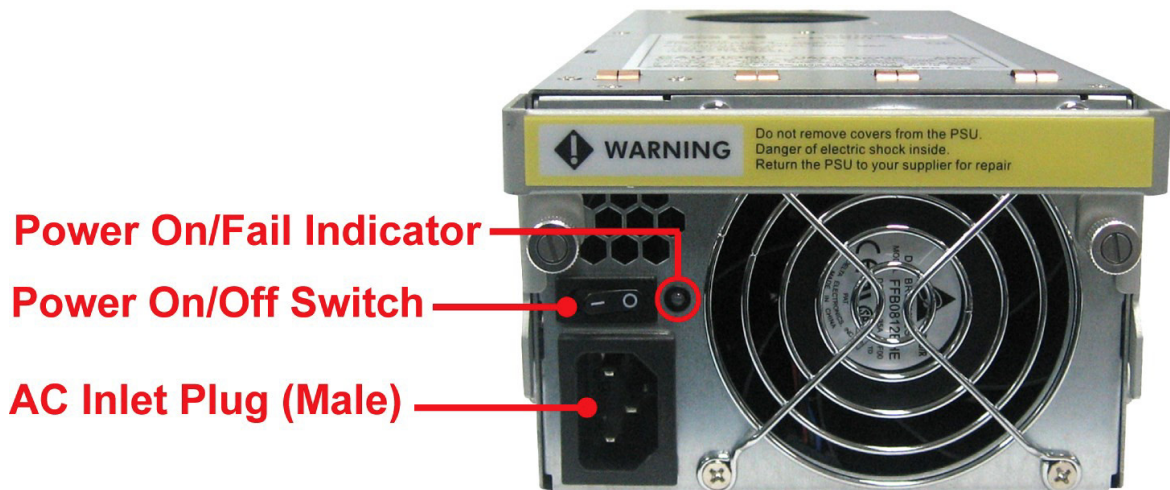
AC Inlet Plug (Male)

The Power Supply/Fan Module panel has:

• Power On/Off Switch

• AC Inlet Plug

• Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

2.7. LCD Display Panel

Figure 2.5. LCD Panel LED

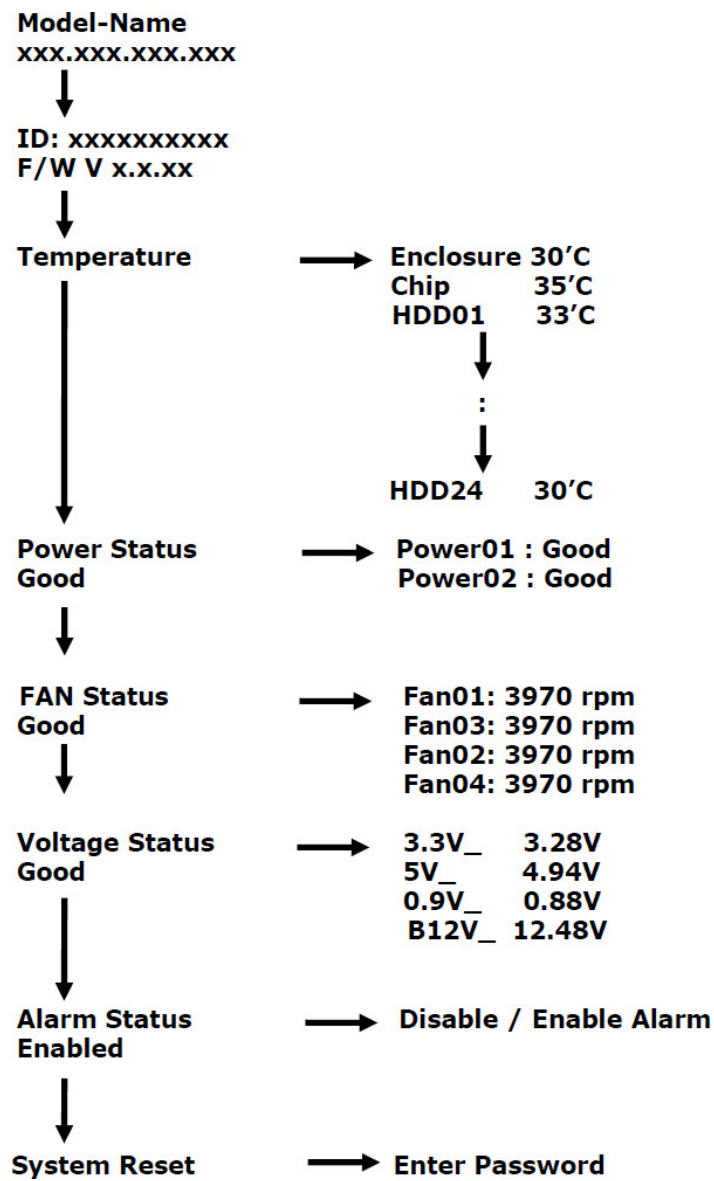| Item	Description
Power LED	Green indicates power is ON.
Power Fail LED	If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound.
Fan Fail LED	Turn RED when fan 1 or 2 fails, or speed is lower than 3000 RPM for Master Fan and 2500 RPM for Slave Fan.
Over Temperature LED	If system temperature is over 70oC or disk temperatures exceed 55oC, the Over Temperature LED will turn RED and alarm will sound.
Voltage Warning LED	An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED.

Figure 2.6. LCD Panel Function Buttons

Item	Description
Up and Down Arrow buttons	Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu.
Select button	This is used to enter the option you have selected.
Exit button	Press this button to return to the previous menu. This button can also be used to silence the alarm beeper when in main menu. If you are in submenu and a failure event happens, press the EXIT button few times as necessary to go back to main menu, and press again to silence the alarm.

Figure 2.7. LCD Panel Menu Diagram

```
Model-Name
xxx.xxx.xxx.xxx
        │
        ▼
ID: xxxxxxxxx
F/W V x.x.xx
        │
        ▼
Temperature    ──────►   Enclosure 30'C
                          Chip        35'C
                          HDD01       33'C
                                 │
                                 ▼
                                 ⋮
                                 │
                                 ▼
                          HDD24       30'C
        │
        ▼
Power Status   ──────►   Power01 : Good
Good                     Power02 : Good
        │
        ▼
FAN Status     ──────►   Fan01: 3970 rpm
Good                     Fan03: 3970 rpm
                         Fan02: 3970 rpm
        │                Fan04: 3970 rpm
        ▼
Voltage Status ──────►   3.3V_    3.28V
Good                     5V_      4.94V
                         0.9V_    0.88V
        │                B12V_   12.48V
        ▼
Alarm Status   ──────►   Disable / Enable Alarm
Enabled
        │
        ▼
System Reset   ──────►   Enter Password
```

2.8. Drive Carrier Module

The Drive Carrier Module houses a 2.5 inch hard disk drive. It is designed for maximum airflow.

Figure 2.8. Disk Drive Status Indicators

Every Drive Carrier has 2 status indicator lights. One indicator light is used for disk status. Green LED indicates power is on and hard drive status is good for this slot. If there is no hard drive, the LED is off. The fault indicator depends on the RAID card or RAID Controller definition.

The other status indicator light is the hard disk drive access light. When the hard disk drive is being accessed, this light will flash BLUE.

In addition, both indicator lights are viewable within a 170° arc.

Chapter 3. Installation

3.1. Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.
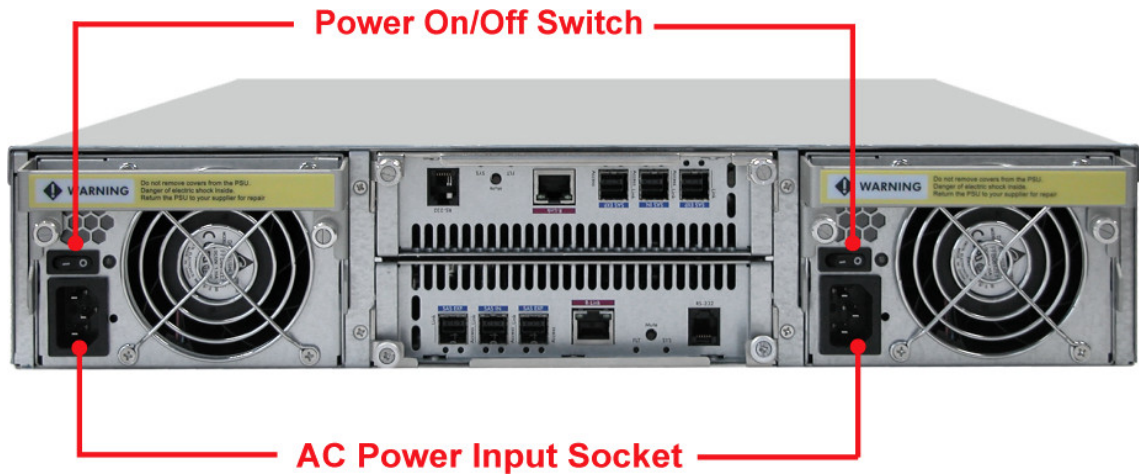
2. Turn on each Power On/Off Switch to power on the subsystem.

3. The Power LED on the front Panel will turn green.

The subsystem is equipped with redundant, full range power supplies with PFC (power-er factor correction). The system will automatically select voltage.

3.2. Disk Drive Installation

This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

1. Press the Tray Open button and the Disk Tray handle will flip open.

Tray Open Button
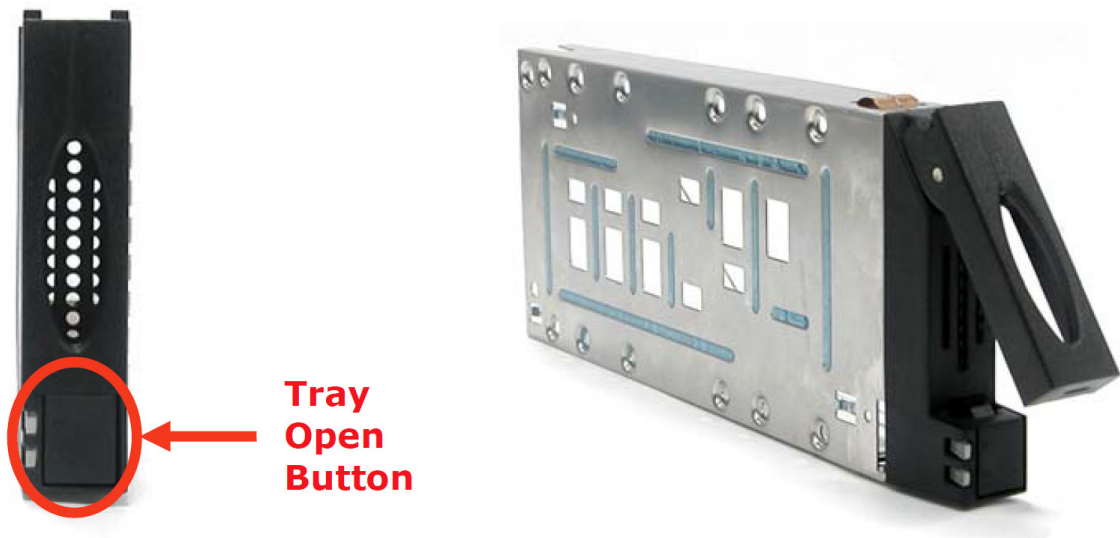
2. Pull out an empty disk tray. Pull the handle outwards to remove the tray from the enclosure.

3. Place the hard drive in the disk tray. Make sure the holes of the disk tray align with the holes of the hard drive.

4. Install the mounting screws on the bottom part to secure the drive in the disk tray.

Installation

5. Slide the tray into a slot.

6. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

24

3.3. Connecting the JBOD Subsystem

The JBOD Subsystem supports SAS interface which provides fast 1200MB data transfer rate using SAS phy. Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

3.3.1. Topology examples

Topology examples are universal and do not depend on the actual product.

Figure 3.1. Typical DAS
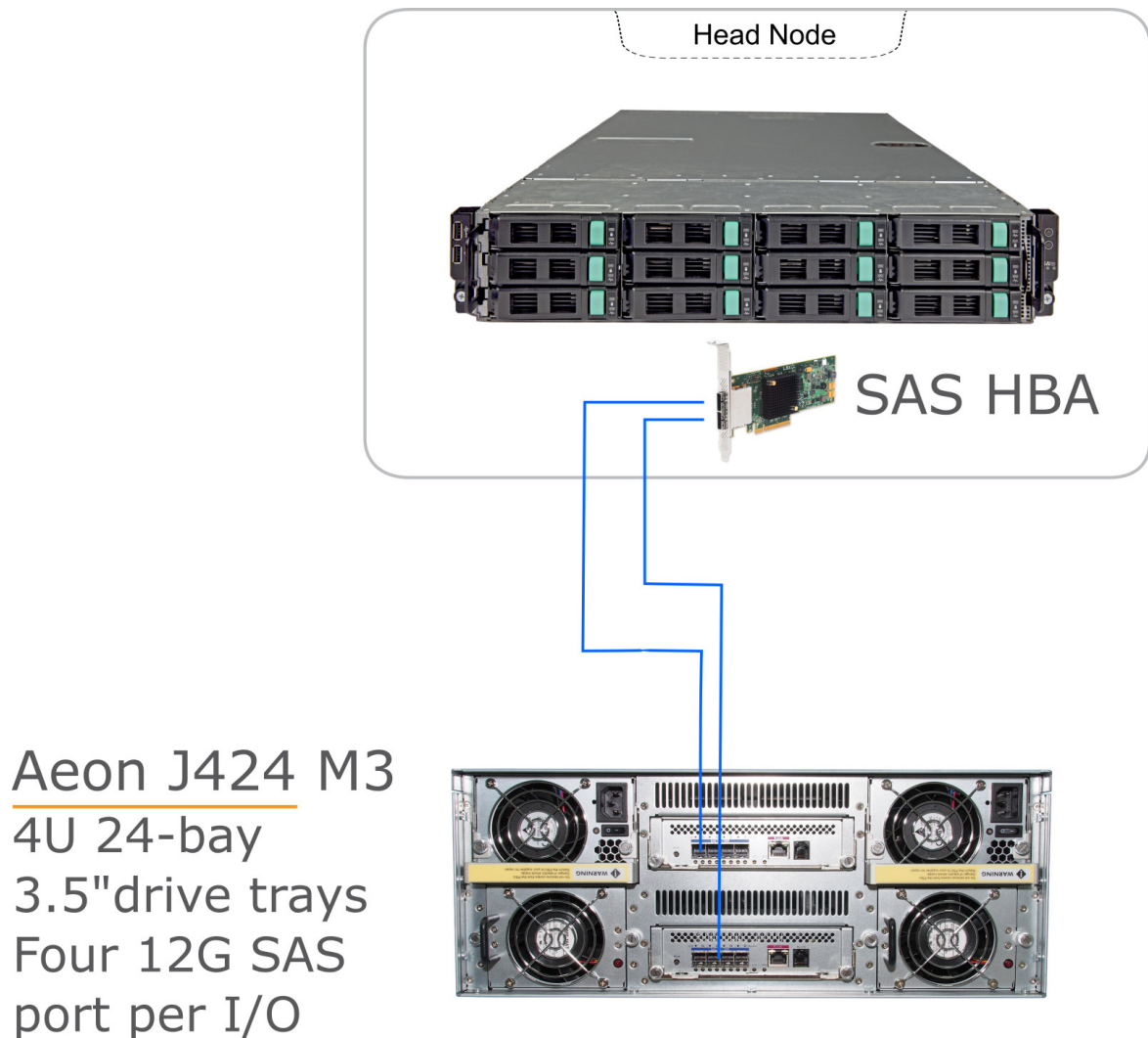
Figure 3.2. HA cluster
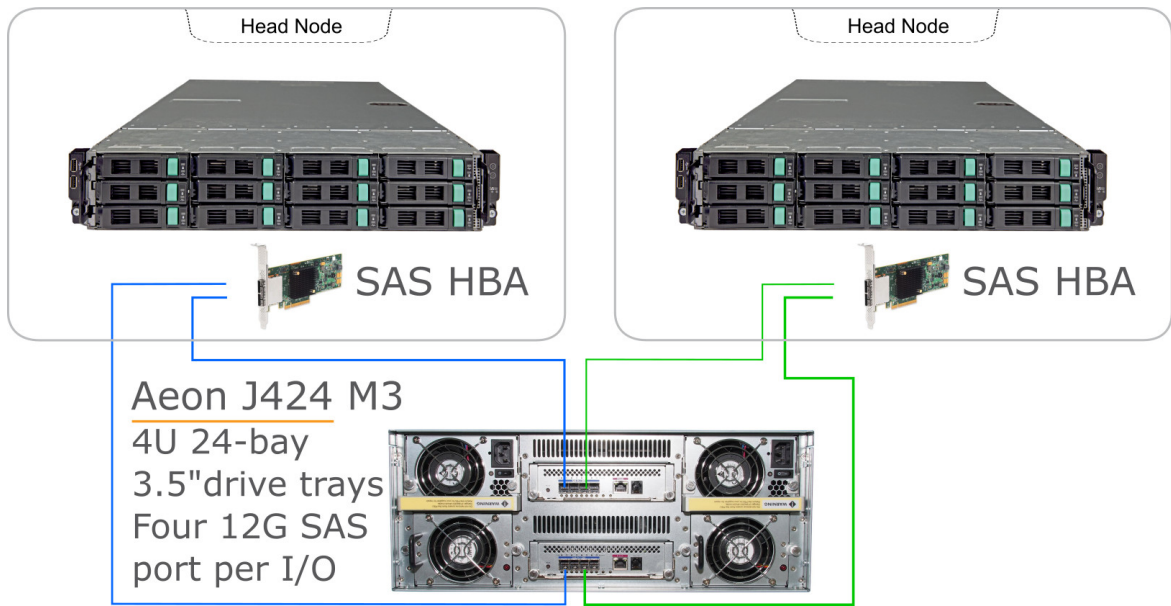
Figure 3.3. Scalable HA solution
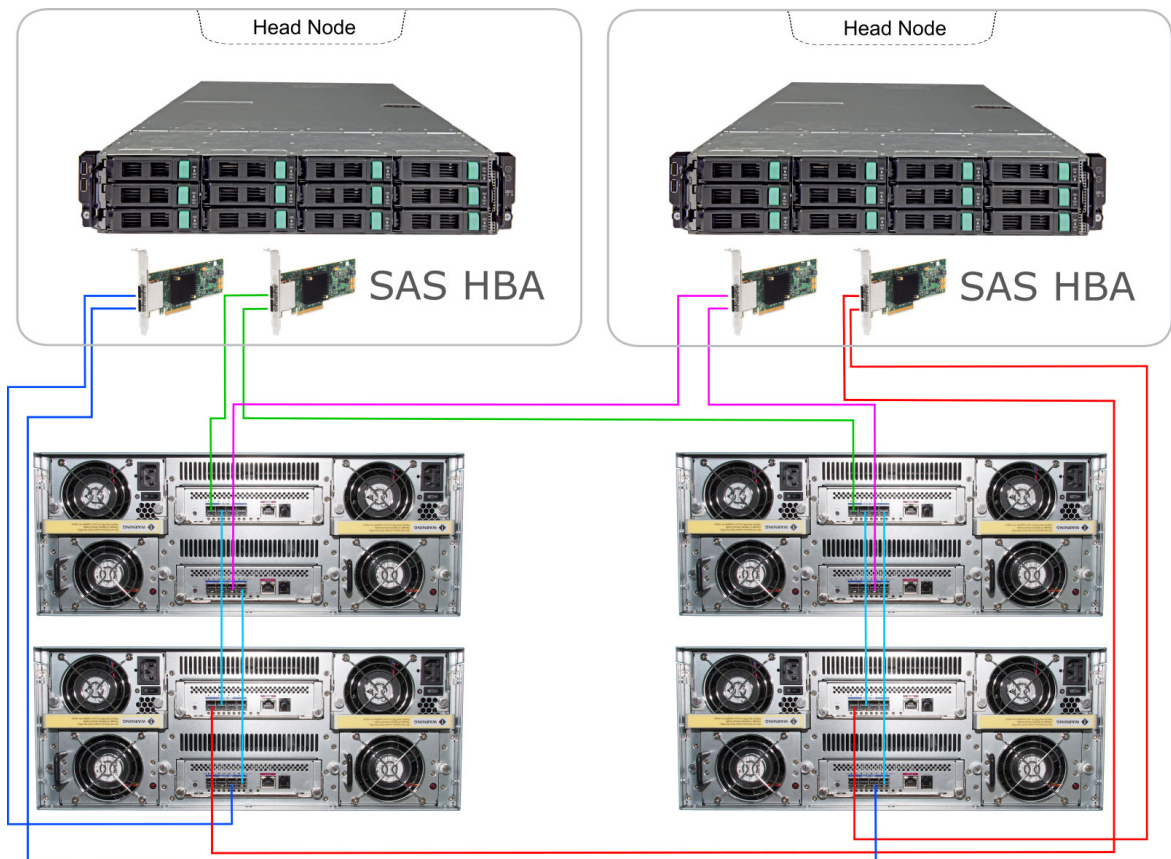
Figure 3.4. Scale-out cluster
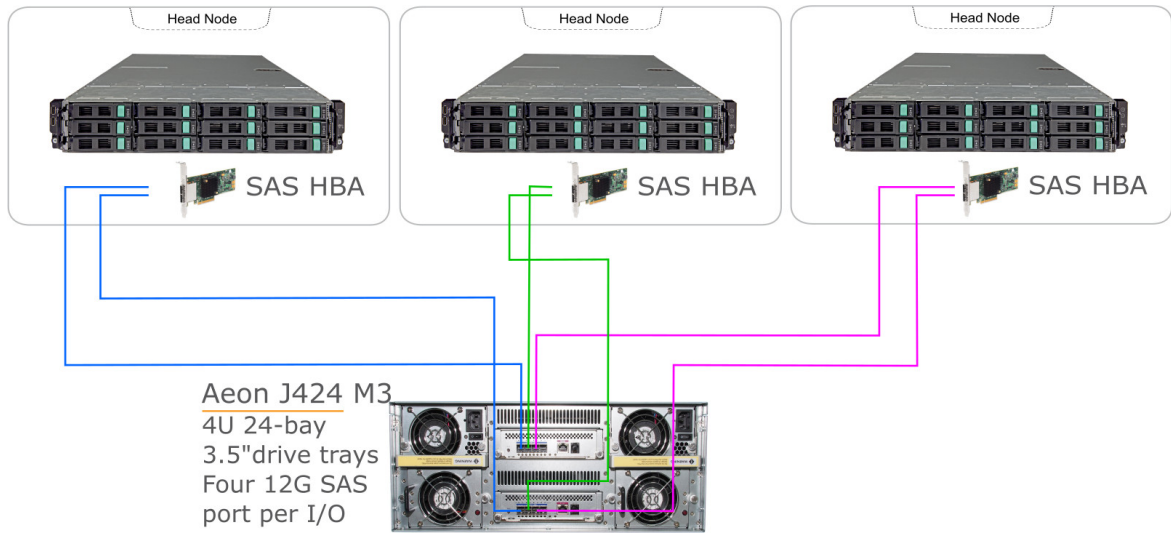
Chapter 4. Maintainance

4.1. Upgrading the JBOD Controller's Firmware

ATTENTION: Before upgrade the JBOD firmware, please shut down server first or make sure no array setting on the JBOD disks. The new Firmware will effective after JBOD power cycle.
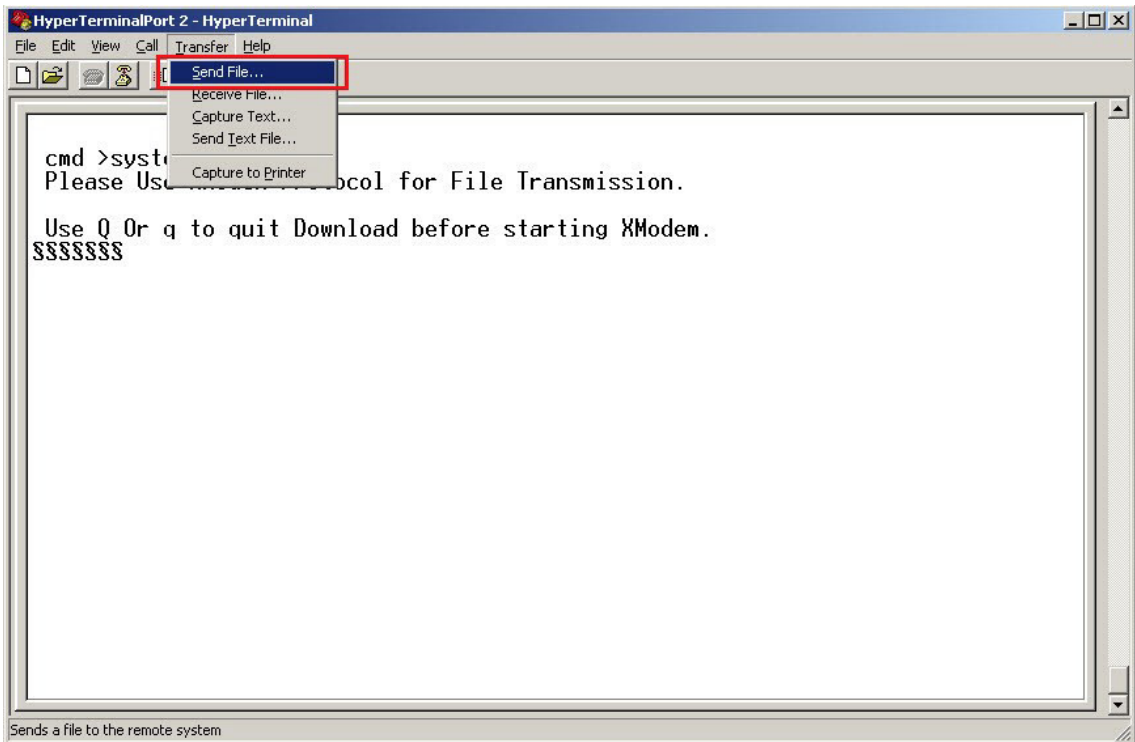
Upgrading the firmware must be done from Master JBOD Controller (JBOD Controller 1) if the JBOD Subsystem has redundant JBOD Controllers.

Steps:

1. Please use the RS232 cable (Phone jack to DB9) to JBOD Controller #1 and to connect JBOD RS232 Port and PC COM1 Port (or change to other COM Port as necessary).

2. Open Windows HyperTerminal Program. Connect using COM1 (COM Port used in Step1), Baud Rate: 115200, n, 8, 1, Flow Control: None.

3. Please type "system upgrade", than press "Enter" in command line.

```
HyperTerminalPort 2 - HyperTerminal
File  Edit  View  Call  Transfer  Help

 cmd >system upgrade
 Please Use XModem Protocol for File Transmission.

 Use Q Or q to quit Download before starting XModem.
 §§§§§§§§_



Connected 0:00:26    Auto detect    115200 8-N-1    SCROLL    CAPS    NUM    Capture    Print echo
```
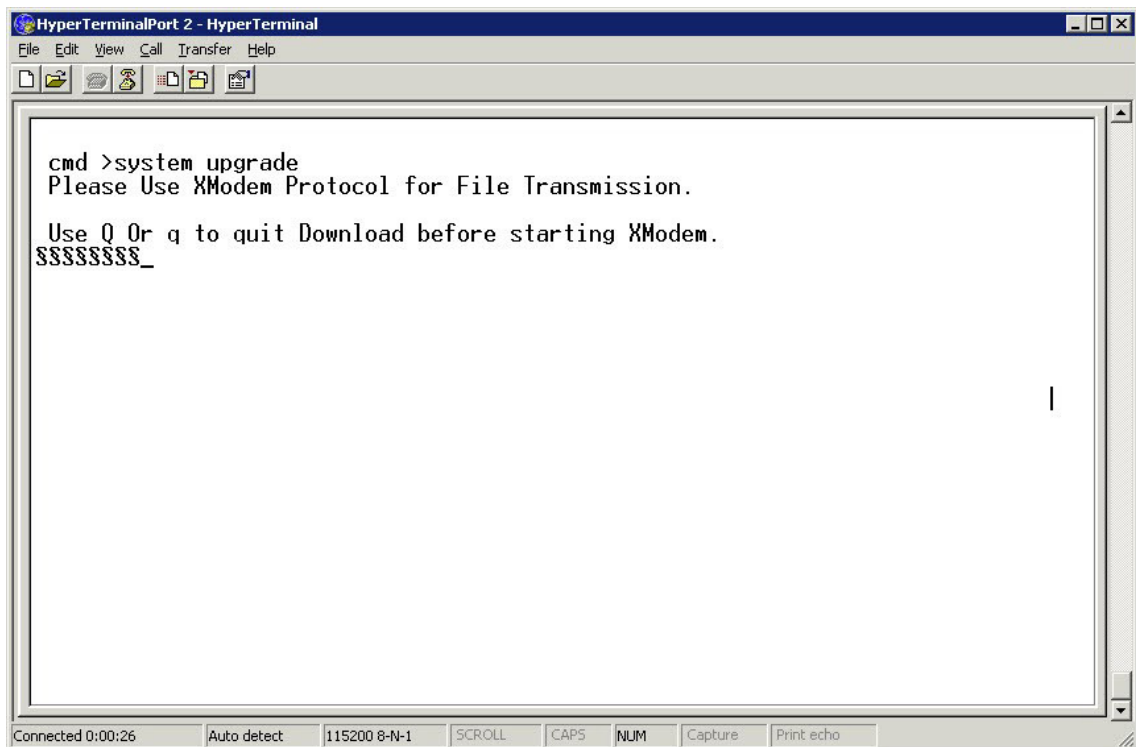
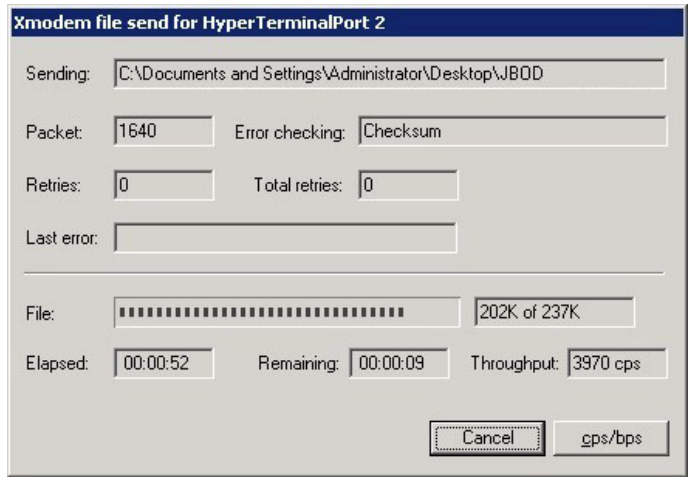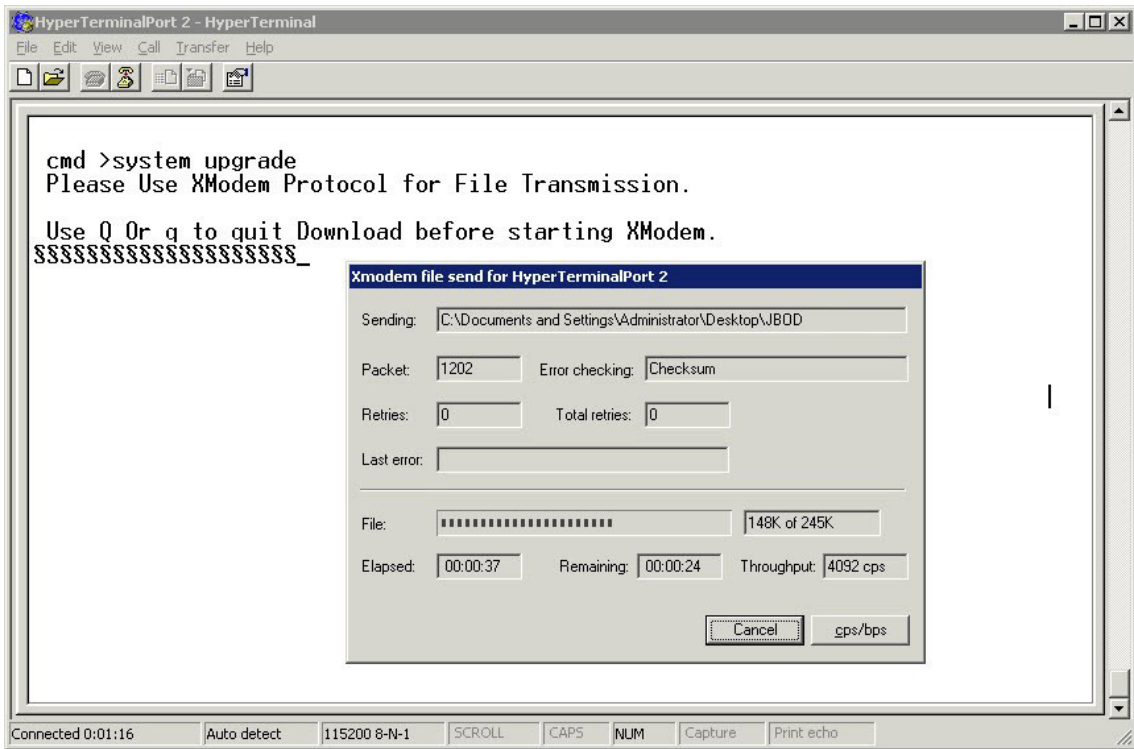4. Select Transfer & Send File. You must finish within 25 seconds

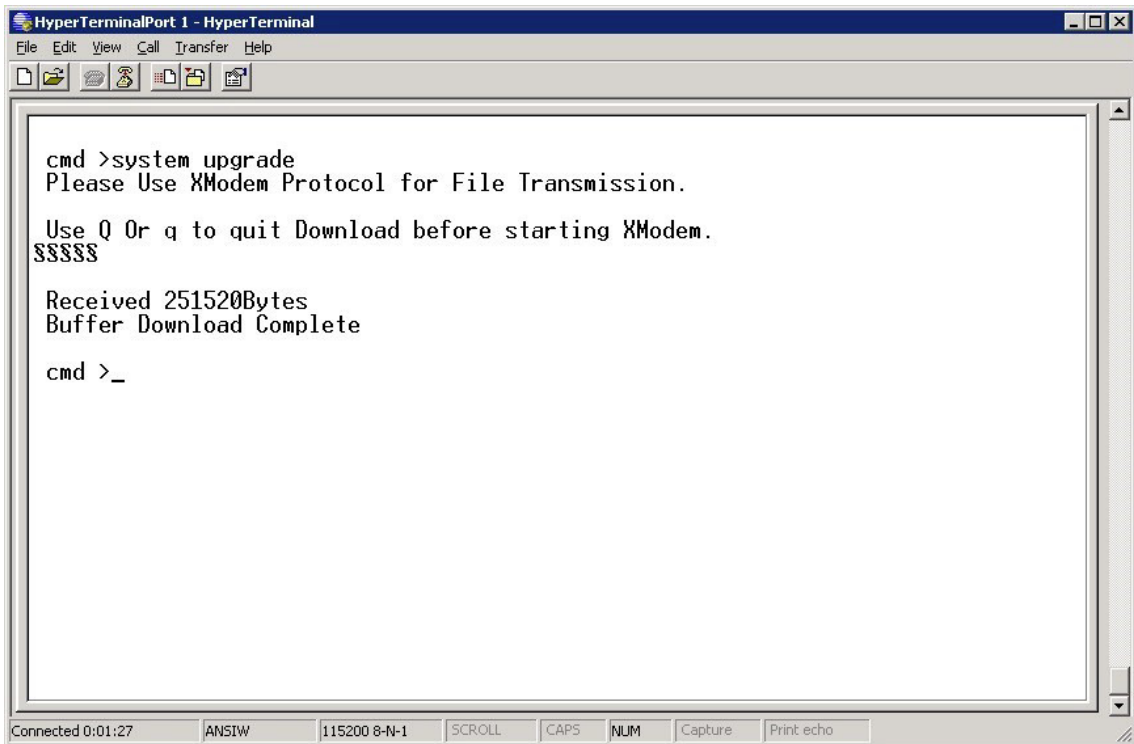5. Select your firmware file path, and select Xmodem in the communication protocol, and click transfer button.
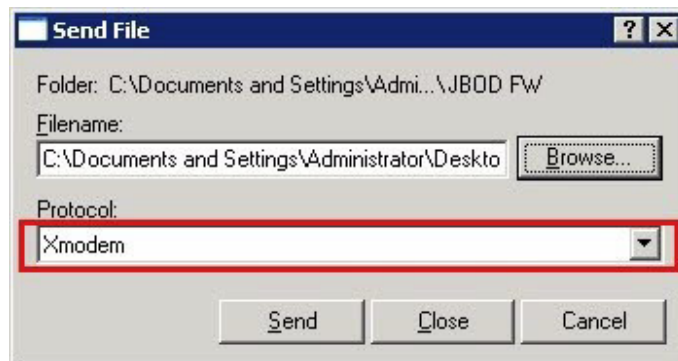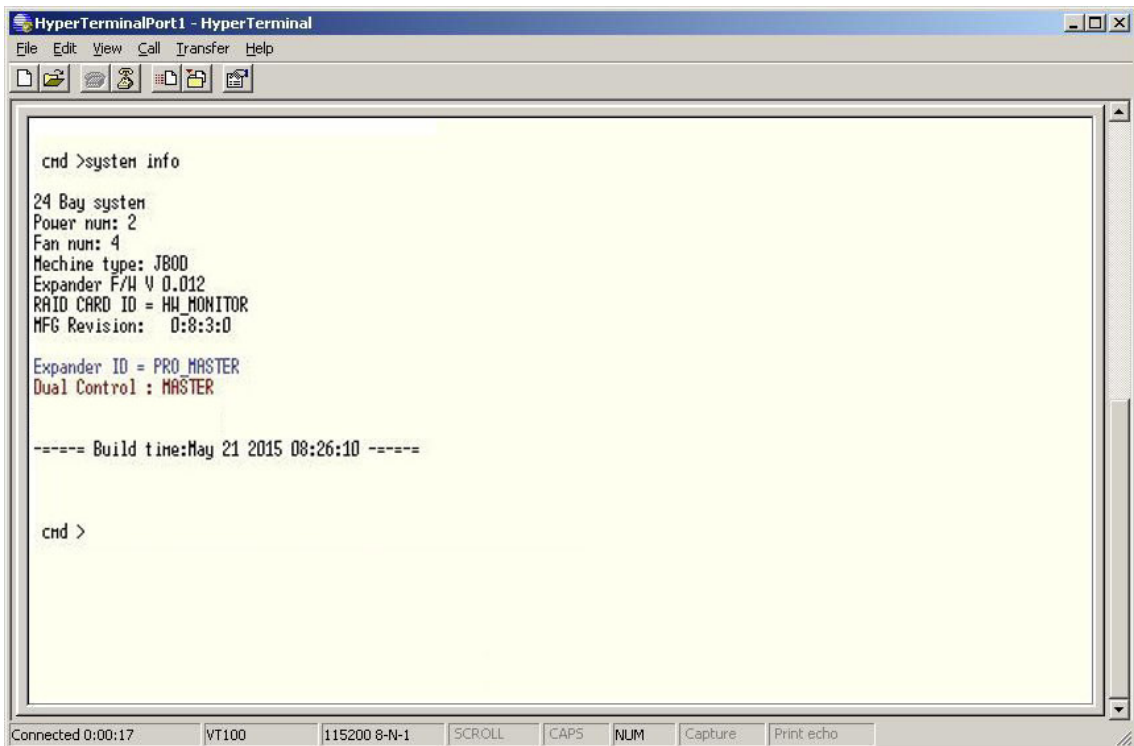

6. Wait for the transfer of file to complete.

7. When the transfer and firmware update is complete, please power cycle the JBOD.

8. In command line, type "system info", you can see the Expander firmware version.

4.2. Replacing Subsystem Components

4.2.1. Replacing JBOD Controller Module

When replacing a failed JBOD Controller Module, please follow these steps:

1. Make sure the subsystem is in power off state. Loosen the thumbscrews on the sides of the Controller Module case.

2. Use the Controller handle to pull out the defective Controller.

3. Insert and slide the new Controller in. Note that it may be necessary to remove the old/defective Controller Module from the case and install the new one.

4. Tighten the thumbscrews on the sides of the Controller Module case.

Replacing JBOD Controller Module with Blanking Plate

When replacing a failed Controller Module with Blanking Plate, please follow these steps:

1. Loosen thumbscrews of the failed Controller Module.

2. Use the Controller Module handle to remove the failed Controller Module from the subsystem.

3. Insert the Controller Blanking Plate included in your package.

4. Tighten the screws of the Blanking Plate.

When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

4.2.2. Replacing Power Supply Fan Module

When replacing a failed power supply fan module (PSFM), please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.

2. Disconnect the power cord from the AC Inlet Plug of PSFM.

3. Loosen thumbscrews of the PSFM.

4. Use the handle to pull out the defective PSFM.

5. Before inserting the new PSFM, make sure the Power On/Off Switch is on "Off" state.

6. Insert and slide the new PSFM in until it clicks into place.

When the subsystem is online and a Power Supply fails, and the replacement Power Supply module is not yet available, the failed Power Supply Module can be replaced with the Plate Cover. This is to maintain proper airflow within the enclosure. (Refer to next section)

When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

7. Connect the power cord to the AC Inlet Plug of PSFM.

8. Tighten the thumbscrews of the PSFM.

9. Turn on the Power On/Off Switch of the PSFM.

After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.

Replacing Power Supply Fan Module with Blanking Plate

When replacing a failed power supply fan module (PSFM) with Blanking Plate, please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.

2. Disconnect the power cord from the AC Inlet Plug of PSFM.

3. Loosen thumbscrews of the failed PSFM.

4. Pull out the defective PSFM.

5. Insert the PSFM Plate Cover carefully.

Power Supply Fan Module Plate Cover