Avid® MediaStream™ Server 8000NS

Site Preparation, Installation, and Reference Guide

for MediaStream Network Storage System

Avid.

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Using This Guide

Congratulations on your purchase of an Avid MediaStream products. This guide contains site preparation, installation tasks as well as reference information.

Unless noted otherwise, the material in this document applies to the Windows XP.

The documentation describes the features and hardware of all models. Therefore, your system might not contain certain features and hardware that are covered in the documentation.

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Symbol or Convention	Meaning or Action
	A note provides important related information, reminders, recommendations, and strong suggestions.
	A caution means that a specific action you take could cause harm to your computer or cause you to lose data.
	A warning describes an action that could cause you physical harm. Follow the guidelines in this document or on the unit itself when handling electrical equipment.
>	This symbol indicates menu commands (and subcommands) in the order you select them. For example, File > Import means to open the File menu and then select the Import command.
▶	This symbol indicates a single-step procedure. Multiple arrows in a list indicate that you perform one of the actions listed.
(Windows), (Windows only), (Macintosh), or (Macintosh only)	This text indicates that the information applies only to the specified operating system, either Windows XP or Macintosh OS X.
Italic font	Italic font is used to emphasize certain words and to indicate variables.
`Courier Bold font`	Courier Bold font identifies text that you type.

Symbol or Convention	Meaning or Action
Ctrl+*key* or *mouse action*	Press and hold the first key while you press the last key or perform the mouse action. For example, Ctrl+drag.

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1. Retry the action, carefully following the instructions given for that task in this guide. It is especially important to check each step of your workflow.

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▶ From the Windows desktop, select Start > Programs > Avid > *[Avid editing application]* Online Library.

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    The Online Library folder is in the same location as the application itself, for example:

    C:\Program Files\Avid*[Avid editing application]*\Online Library

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Using This Guide

Chapter 1
Introduction

This chapter provides an overview of the MediaStream (MSS) Networked Storage System covering the following topics:

- MediaStream Overview
- Major System Components
- System Features
- Basic System Layout
- MSi Host PC

You may be able to obtain more recent versions of this and other related manuals in Adobe Acrobat PDF format. Go to the Avid MediaStream Support website: www.avid.com/onlinesupport/.

Overview

The MediaStream Networked Storage System is the latest generation of Avid MediaStream Servers (MSS). The Avid MediaStream family of servers was first introduced in 1992 as part of Hewlett Packard's Video Communications Division that pioneered MPEG2-based broadcast-quality video servers. Avid MediaStream acquired the Video Communication Division in 1999, and has continued innovative developments. The Avid MediaStream Networked Storage System builds on the legacy MediaStream and supports all current and future video I/O hardware.

The Avid MediaStream Server Networked Storage System is based on the existing MSS Servers with the addition of the following key features and benefits:

- Centralized storage—All MSS Networked Storage server nodes belonging to a networked storage cluster have access to a common pool of storage. In this model, one server node can be used for ingesting video material while other nodes play the ingested material back within seconds of the start of the record process.

- Simplified automation—Since the need to copy video material is eliminated within a storage cluster, media management is dramatically simplified. An entire Networked Storage Cluster is viewed by automation as a single server, eliminating the need for complicated schedule driven heuristics and algorithms to ensure that playout material is available at the right server.

- Fully backwards compatible—The MSS Networked Storage System is fully compatible with standalone MSS servers, and files can be shared between existing MSS servers and the MSS Networked Storage server nodes.

- No single point of failure—All common storage and common file system components are fully redundant and transparently fail-over in real-time.

- Hot swap of redundant components—All redundant components can be exchanged in case of failure while the system is operational.

- Hot expandable—You can expand storage capacity and channel count while the system is on-air.

Major Components

Three major components make up the MSS Network Storage System:

- MSS Networked Storage File System
- MSS Networked Storage System server nodes
- Palladium 1000 storage system

Networked Storage File System

The Networked Storage File System maintains a database of the location of clips on the Palladium Store 1000 storage system. It runs on two fully redundant Windows 2000 computers called File System Controllers (FSC) as shown in the following figure. The Networked File System software automatically mirrors File System changes on one FSC onto the redundant FSC in real-time. In case of a FSC failure, or any connection failure between a video server node and the FSC (including an Ethernet switch failure), the server nodes can continue to access the Networked Storage File System without interruption via the redundant Ethernet control path.

File System Controller

Each FSC is linked via a VLAN (Virtual Local Area Network) Ethernet topology through its own VLAN switch to the MSS Networked Storage System server nodes. This further enhances network isolation and prevents network loops from causing potential additional latencies in the network if a failure occurs in the Ethernet topology itself. The MSS Networked Storage System requires two FSCs regardless of the size of the system. This important feature contributes to the system's ability to handle real-time fail-over scenarios.

VLAN Switch

MSS 8000 Server Nodes

The video input/output (I/O) portion of the MSS Networked Storage System is the MediaStream 8000 server nodes. Server nodes provide the video engine of the system. The MediaStream 8000 chassis incorporates nine video I/O slots in a 5 rack unit (RU) package. The MSS 8000 is based on proven MediaStream 700/1600 platform technology.

MS Server 8000

Each server node has redundant connections to both FSCs through redundant VLAN switches. In addition, communication to the storage system is via Fibre Channel connections to redundant controllers in the storage system. This design provides for dual data paths and fast fail-over should key components or connection paths fail (see "MSS Networked Storage System Configuration" on page 31).

As with existing MSS systems, each server node contains its own System Controller board, redundant power supplies, fans, and a combination of encoder and decoder boards. In general, decoder boards play content out to broadcast, while encoder boards convert 601 Serial Digital to MPEG-2 for storage on the system.

An individual server node can provide up to 16 channels. One MSS Networked Storage System can accommodate up to 16 server nodes. This system is referred to as a *cluster*. An expanded system can support up to 16 clusters that can share data through an FTP gateway server node.

The server node interfaces with the station's automation system via RS-422 protocol and Ethernet .dll and sends the video content in specified formats to the station's routing system.

VME Bus

The System Controller board and other control boards plug directly into a VME backplane (bus). The System Controller board controls traffic on the backplane, while direct processing power is distributed among encoders, decoders, and the other boards plugged into the VME bus. Data flow between the array controller and input/output cards travels down the back plane of the bus.

LynxOS™ Operating System

The server nodes run under the LynxOS, a real-time variant of the industry-standard UNIX operating system. LynxOS provides a stable platform for reliable real-time playout and record of video with a low risk of system interruption.

AMS

AMS is the primary server node application that provides interface and control with automation.

Palladium Store 1000

The Palladium Store 1000 storage system consists of one or more storage units. Each Palladium Store 1000 chassis contains dual RAID controllers and 10 disks in two redundant 4+1 sets.

In case of a single disk failure in either or both of the disk sets, the system continues to operate normally at full performance. After replacing the faulty disk, the system can reconstruct the data from parity while operating at full performance.

Palladium Store 1000 - Front Bezel
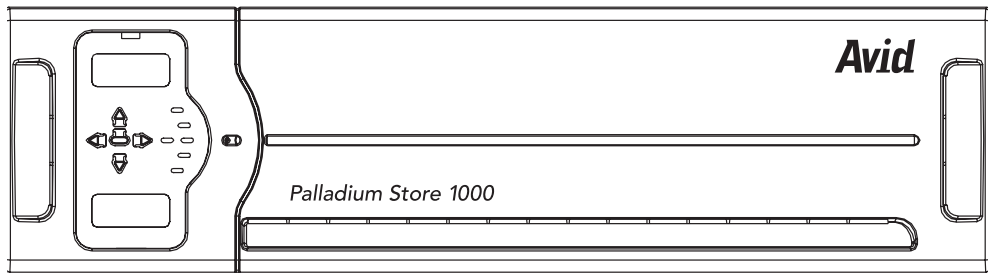
Each controller provides a separate data path to the server nodes. In case of a component failure, the system will continue to operate normally. Hardware replacement of the failed component can occur without service interruption.

MSS Networked Storage System Features

File System Redundancy

The MSS Networked Storage System is able to sustain a failure in any file system control component without performance degradation, video loss, or jitter. The redundant MediaStream Networked Storage File System control path consists of the following three components:

• Two redundant FSCs that are independent from each other in software and hardware, and which mirror the FSC File System in real-time.

- Two redundant VLAN Ethernet switches, which are independent of each other in functionality. These switches provide isolated connections between the video server nodes and the two FSCs. The VLAN topology design prevents network loop conditions that could lead to unacceptably long network time-out scenarios during an Ethernet LAN connection failure.

- Two redundant Ethernet control connections on the server node connected to the two VLAN switches.

During normal operation, one of the FSCs acts as the *Primary* Controller, while the other acts as the *Hot-Standby* Secondary Controller. The Primary Controller controls the content mirroring process of the Hot-Standby Secondary Controller; however, all MediaStream 8000 server nodes communicate directly with both the Primary and Secondary Controllers even during normal operation and treat both FSCs equally. All File System requests issue twice, one request per FSC, allowing for a transparent fail-over if one of the Controllers does not respond.

Multiple *Watchdog* software modules distributed in the FSCs and the server nodes constantly monitor the File System components and Ethernet connectivity. These software modules ultimately make the decision if and when to switch the Secondary Controller to become the Primary Controller. At that point the original Primary Controller is off-line and can be serviced. Once the old Primary Controller comes back on line, it will automatically become the Secondary Controller and will slave itself to the Primary Controller for content mirroring and other housekeeping tasks.

Video Data Path Redundancy

The system is able to sustain a failure in one of the Fibre Channel data paths without performance degradation, video loss, or jitter. The redundant data paths consist of the following components:

- Dual Fibre Channel ports on the Fibre Channel card of the server node. These ports are independent of each other in hardware and software.

- Dual RAID controllers per array. Both controllers are independent of each other in hardware and software. Both FSCs have access to all of the storage at full bandwidth.

- Required Fibre Channel switches are always installed in redundant pairs.

- During normal operation, only one data path is used to read/write the data from/to the storage system. If a failure in the data path occurs, the server node software detects this failure in real-time and switches transparently to the other redundant data path. Since all components are designed to deliver data at or above full bandwidth, there is no performance degradation. The real-time fail-over design prevents video outages at the decoder, as well as data overflow scenarios on the encoder system.

MSS Networked Storage System Configuration

All MediaStream Networked Storage Systems require redundant FSCs roller and redundant VLAN switches for data control and redundant Fibre Channel switches for connection to the array(s).

MediaStream Redundant System
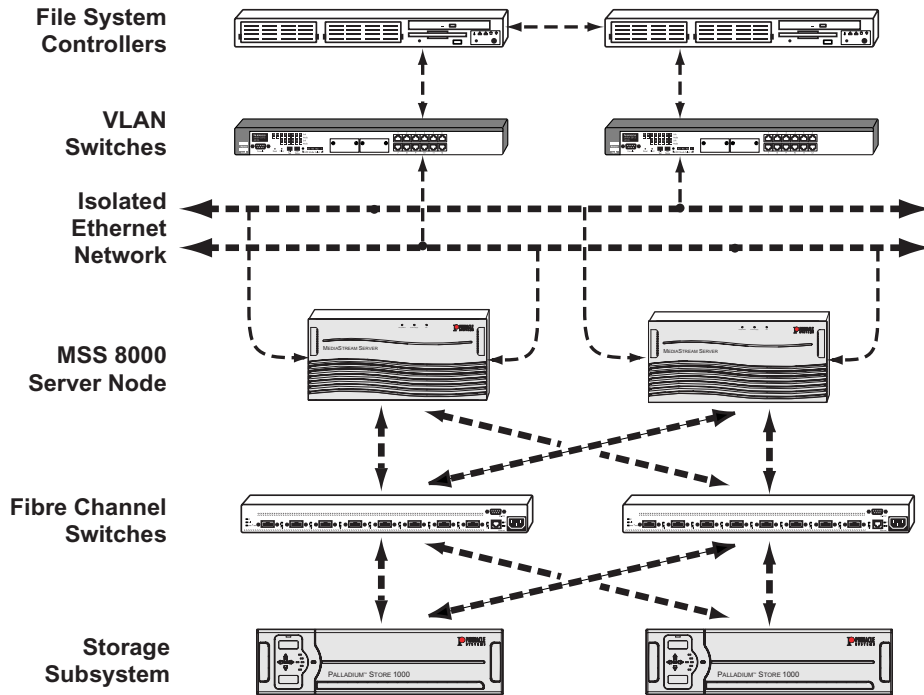
Adding Video Server Nodes and Channels

In most cases, adding additional video server nodes and channels to a system means that the bandwidth requirement increases. Operators need to properly calculate if sufficient bandwidth exists to support the increased channel count. This calculation can vary significantly because it depends on how the system is used and operated in a given facility. See for Appendix A for bandwidth calculation tables.

Adding additional channels to a server node is a straightforward process. Only the server node that receives the channel upgrade needs to be shut down for the hardware and configuration upgrade. Everything else will continue to operate normally.

Adding a server node involves hot-plugging the unit into the Ethernet VLAN topology to provide file system connectivity and to connect the dual Fibre Channel interface into the Palladium Store 1000 storage system. The Ethernet and Fibre Channel topology is factory pre-configured to accommodate run-time configuration changes.

Adding Arrays to the System

Once the additional storage has been physically added, the operator needs to run File System utilities to add the additional storage to the File System. For more information contact Avid MediaStream Support.

The MSi Host PC

The system is administered via a host PC. The PC runs an application called MediaStream Interface (MSi) that allows support personnel to playout, record, and run diagnostics on the system components. Communication between the Host PC and the system components is via redundant Ethernet connections to the dual VLAN switches. Depending on the configuration, a storage cluster may have either one or two MSi PCs. Where there are two MSi PCs, both have full access to all server nodes and both FSCs. Serial communication to server nodes is provided by a Lantronix Ethernet-to-serial interface that integrated into each server node chassis. This connection allows full access to the boot-up sequence of each server node.

MediaStream Interface (MSi)

MSI Screen Display

The MediaStream Interface (MSi) is a Graphical User Interface (GUI) application used for administering the MediaStream Server. The MSi provides support personnel a means of playing, recording, rebooting, installing new software, and performing other maintenance activities on the server node. While the MSi is capable of performing many activities associated with playing and recording media clips, it is meant to be used as a support and diagnostic tool.

Simple Network Management Protocol (SNMP)

The MSS Networked Storage System includes status monitoring with Simple Network Management Protocol (SNMP). The MSi's System Status window presents SNMP data in an easy to monitor graphic interface.

MediaStream System Status Window

The data is updated automatically at regular intervals (about two minutes). A trouble condition, reported in any of the server node's key operating modules (disk drives, array, power supply, or cooling fans), updates the System Status display and changes the button alert color to red. Click the System Status button to see a graphic representation of the server node, FSCs, and arrays. A failed component is highlighted in red in the System Components pane.

Chapter 2
System Components

Although a MSS Networked Storage System may vary in scale and size, all systems share certain components. This chapter examines the components that comprise a MSS Networked Storage System:

- MediaStream 8000 server nodes
- File System Controllers
- Palladium Store 1000 Storage systems
- VLAN switches
- Fibre Channel switches
- MSi PC
- ConnectPlus 1000 NS Gateway PC

MSS 8000 Server Nodes

The MSS 8000 server node dseign uses VME 64-bit bus architecture (bus) and provides high-speed communication between boards with a throughput of 400 Mbps. Direct processing power is distributed among the cards plugged into the back plane.

The server interfaces with the station's automation system using the RS-422 port with Video Disk Control Protocol (VDCP) as defined in the Avid MediaStream VDCP documentation and Ethernet LAN controls. Video content is sent in specified formats to the station's routing system.

Avid MediaStream Server 8000
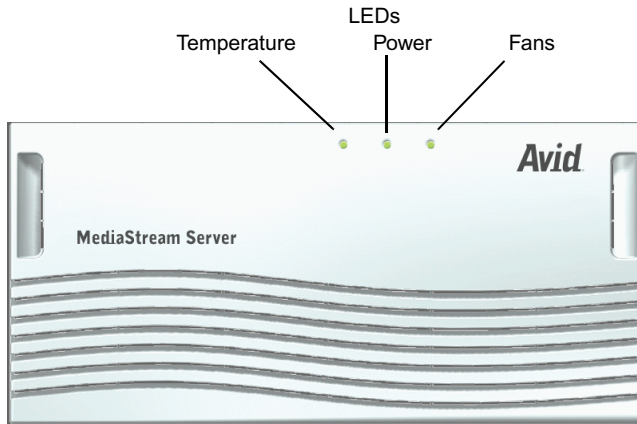
After removing the server's front panel, you can access the redundant hot-swappable power supplies and view the three LED indicators for temperature, power supply, and fan status. You can remove the cover that encloses the CPU I/O board (provides LAN, SCSI and RS-232 connections to the CPU) and the Boot Drive. Mounted on the right side of the unit in a pullout tray is the Lantronix Ethernet-to-Serial Interface that provides Console port access via Telnet.

Avid MediaStream Server 8000 - Front with Bezel Removed
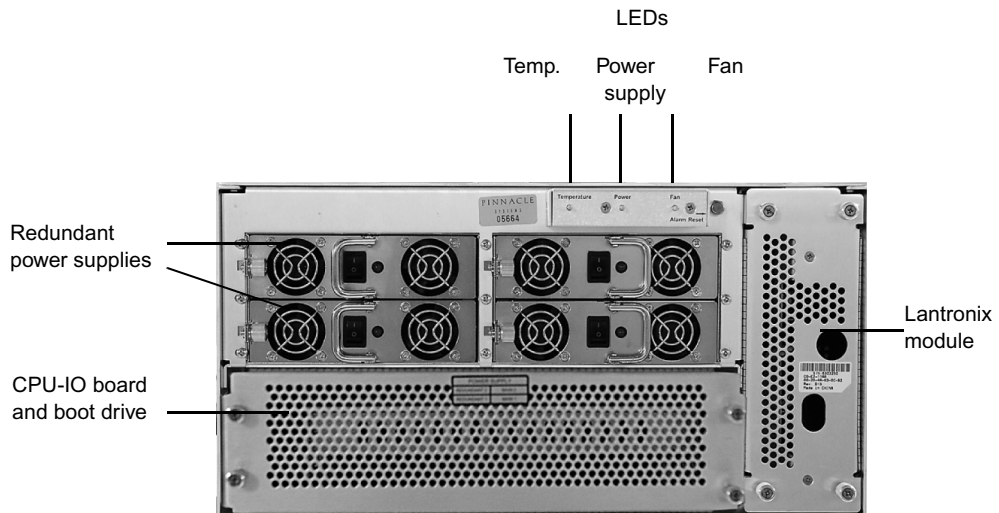
Avid MediaStream Server 8000 - Rear
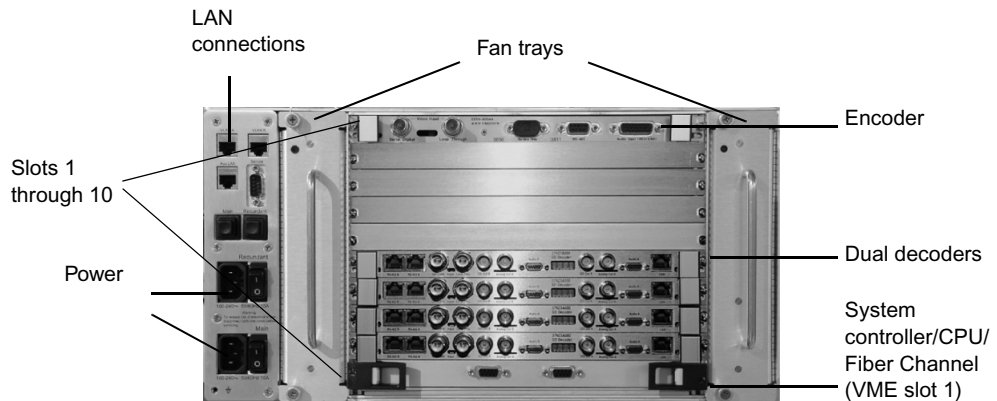
In the rear panel, VME slot 1 (bottom rear slot) contains the System Controller (CPU)/Fibre Channel board that provides system control and data transfer to the Palladium Store 1000. Slots 2 through 10 (numbering from bottom to top) contain decoder and encoder boards. Up to 16 input/output channels can be supported using a combination of single- and dual-channel boards. The left side of the unit contains LAN connections and power switches.

System Controller

The System Controller board regulates backplane traffic. It performs only a fraction of the actual computing on the Server; other boards perform activities such as MPEG compression/decompression. The System Controller Board regulates traffic by maintaining the bit rates of real-time processes (play and record) at the expense of non-real-time processes, such as administrative tasks. No encoder or decoder traffic actually passes through the System Controller Board. Video Input/Output traffic passes directly across the VME Bus to its destination.

System Controller Board (CPU)

The MSS 8000 Boot Disk Drive mounts above the CPU-IO board and connects to it via a SCSI connection.

MSS 8000 Boot Disk Drive

CPU I/O board
connects to
VME backplane

Boot disk
tray
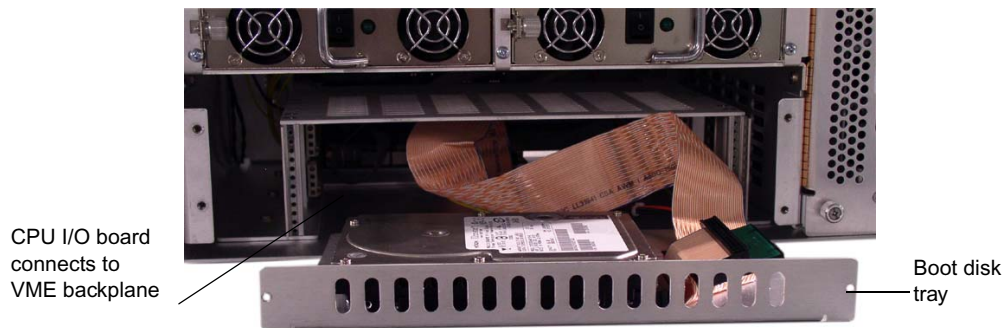
Encoders

System encoders are responsible for coding video for storage on disk. Base band ITU 601 video enters the System via a Serial Digital Interface (SDI) port on the encoder board. A 601 signal has a bandwidth of 270 Mbps, far too high for storage on a storage array. The encoder applies MPEG video compression to the signal, which reduces the signal to between 6 Mbps and 50 Mbps.

After the signal is compressed it is passed through the encoder to the VME back plane and through Fibre Channel Adapter (FCA) to the external storage array. Encoders do not have circuitry for playing out video signals. Signals must first be recorded to disk. Playback and preview is accomplished by playing disk-based segments through a decoder card.

Encoder cards cannot accept analog signals. These signals must be converted to ITU 601 via an analog to digital converter. The Revision 3 Encoder supports encoding for up to 8 channels of embedded audio.

AES-EBU audio is connected through an audio input module, which is bridged to the encoder with a custom cable. Encoders are controlled by automation systems via RS-422, which guarantees frame accuracy in recording.

Encoder Board

Note: Unlabled items are not used.

Decoder boards are required to playback signals from the array to air. Decoders output embedded AES/EBU audio with SDI, separate AES-EBU and analog audio (via adapter panel) and Composite NTSC or PAL analog video. Software must be configured for embedded audio on or off. Video connections are via BNC while audio connections are ported via a special cable to a breakout panel. A loop-through Genlock port and an RS-422 control port are included as well.

The board designs employ new audio connections and new automation connections. Connecting cables ship with each board. There are different cable connections for the four, six, and eight channel audio versions of the boards.

The Audio cable part numbers are as follows:

* PN: 51010004 Cable audio 4 channel
* PN: 51010005 Cable audio 6 channel "Y" (Decoder)
* PN: 51013529 Cable audio 8 channel "Y" (Decoder)

The SD (Standard Definition) board comes in *Dual* and *Single* configuration. The Dual Decoder board provides two channels of playout on a single card. Each channel has a composite video output and an SDI SMPTE 259M output. The connections for Dual and Single Decoder boards are the same, but the video, audio and control connections for the B ports are not active and are not labeled on the Single boards. The board has support for four, six, or eight channels of 16- and 20-bit audio which can be used for Dolby E or Dolby

Digital pass through. The board also features jog, shuttle, and Pinnacle's patented CleanCut MPEG decoding at bit rates up to 50 Mbps per channel. The following figure shows the connections for the Dual SD Decoder board. The single version of the board has the same connections, but the B Port connections are not active.

Dual Channel SD Decoder

Serial B Serial A Genlock Loop SDI B Analog B Audio B Dec 1 SDI A Analog A Audio A

Genlock LED
Green: Genlock Available
Orange: Genlock Unavailable

Display alternates
between port addresses

DO NOT USE
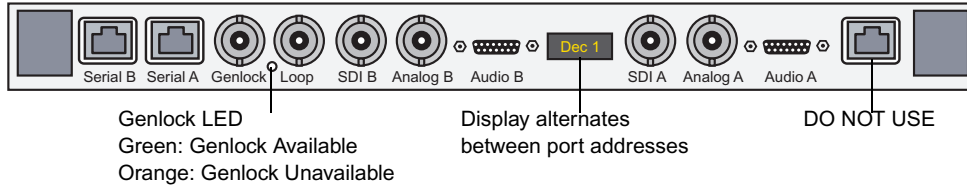
📖 *The latest Avid I/O board is an all-in-one board with 8-channel audio that can be converted into either a dual channel SD/HD Decoder, HD Input, or MPEG Input/Output board.*

The HD (High Definition) decoder board provides SMPTE 292M output with a down-converted SD SMPTE 259M output channel. The board comes in dual- or single-channel configuration and supports four or six channels of audio, using the same audio standard as for the SD board. The board also supports jog, shuttle, and Avid MediaStream Systems' patented CleanCut MPEG decoding at bit rates up to 50 Mbps for each channel.

📖 *Attach a 75-Ω terminator to the HD outputs when not in use.*

Dual Channel HD Decoder

Serial B Serial A Genlock Loop HD B SDI B Audio B Dec 1 HD A SDI A Audio A

Genlock LED
Green: Genlock Available
Orange: Genlock Unavailable

Display alternates
between port addresses

DO NOT USE

MPEG I/O Board

Serial B Serial A Genlock Loop SD OUT B ASI I/O B SD OUT A ASI I/O A
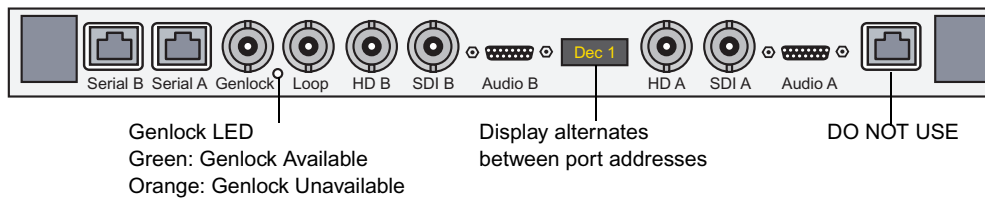
Note: Unlabeld items are note used.

Display shows port
addresses

One of the factors in configuring an HD system is the bandwidth limitation. At 50Mbps, a dual channel HD Decoder board and an HD Input board will occupy up to 200 Mbps of bandwidth at maximum load (worse case).

HD Dual Channel Decoder

Channel 1 (Port A)	50 Mb + 25 Mb (Cueing)	= 75 Mb
Channel 2 (Port B)	50 Mb + 25 Mb (Cueing)	= 75 Mb

HD Input Board

Single Input	50 Mb	= 50 Mb
Total		= 200 Mb

📄 *The MediaStream HD Solution requires an external HD Encoder that can provide an ASI signal to the MPEG Input card.*

File System Controller

📄 *The following figure shows the FSC 80 and FSC 200 models. If you have the Super Micro or the IBM 335 models, see Appendix D.*

File System Controller — Front

FSC 40

FSC 80

FSC 100

The MSS Networked Storage System design employs redundant Windows 2000 PCs to operate as external File System Controllers (FSCs). Regardless of the size of a server cluster, the system will always use only two FSCs. These controllers manage the content database that is accessed by all server nodes for content playout. FSCs occupy one rack unit each.

The Power button enables you to safely shut down the Windows OS component of the unit for servicing without requiring access to a Windows 2000 interface.

Powering down a FSC without verifying current system status could bring the system off-air.

The rear of the unit provides monitor/keyboard/mouse connections and Ethernet and VLAN connections.

File System Controller — Rear

FSC 40

FSC 80

FSC 100

Palladium Store 1000

Each MSS Networked Storage System cluster contains one or more arrays. Each array storage unit consists of dual redundant Controllers. The array chassis contains 10 drives in two banks of 4 plus 1 configured disks.

Avid Palladium Store 1000
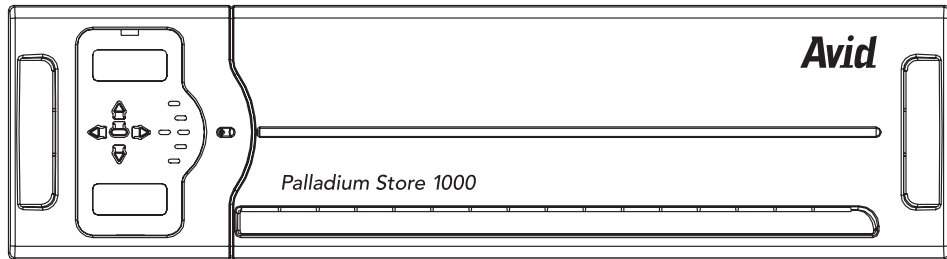
PS 1000 Controller Status Display
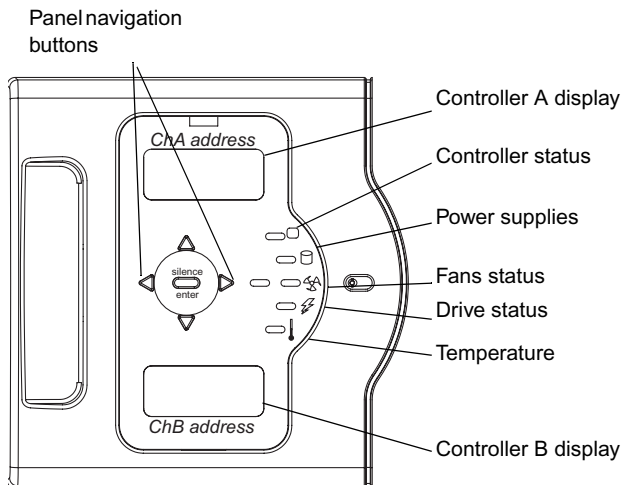
The array storage chassis provides a display panel allowing monitoring of the chassis and individual drives

The LED indicators on the front panel are as follows:

• Address indicator for Channel A and Channel B controllers

• Temperature indicator

• Disk status indicator

• Fan status indicator

• Power indicator

• Controller status indicator

VLAN Switches

Each MSS Networked Storage System cluster employs two Hewlett-Packard Pro Curve VLAN 24 port switches.

Hewlett-Packard Pro Curve 2524 Switch

The left side of the switch contains an RS-232 console port for setup and configuration of the switch, and indicators for switch status and activity.

HP Pro Cure 2524 Switch Indicators
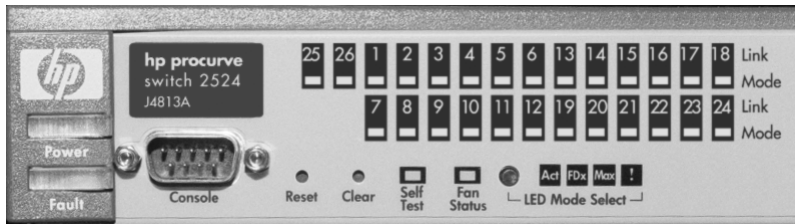
The following table describes the VLAN switch control panel display.

VLAN Switch Indicators

LED	Meaning	Significance
Power (green)	On. The VLAN is powered up	OK
	Off. No power	Fix power supply
Fault (orange)	Off. Normal	OK
	Blinking. Fault detected	Look for component LED blinking in unison
	On. Goes out after self-test. If it remains on, self test failed	Fatal hardware failure. Call tech support

LED	Meaning	Significance
Self Test (green)	Off. Normal during operation	OK
	On. Self-test in progress	OK
	Blinking. Component failure	Look for component LED blinking in unison
Mode Select (three green LEDs)	Act. Port LEDs set to display network activity	A display option
	FDx. LEDs lit for ports in full duplex mode	A display option
	Max. LEDs lit for ports operating at full link speed	A display option
	!. Port LEDs display network events that could require operator attention, such as CRC errors and network collisions	A display option
Fan Status (green)	On. Normal	Fans work
	Blinking. Failure	Fan needs replacement
Port Activity	LAN port with matching number is sending or receiving	LAN port works

Fibre Channel Switches

Your system will include two independent and redundant Fibre Channel switches. Depending on the size of the cluster, different Fibre Channel switches will be used. The Fibre Channel switches provide the link between the server nodes and the Palladium Store 1000 storage arrays. Each switch provides an independent path to each server node and to each array. Up to 16 server nodes and one-to-eight storage arrays are connected to the switches. Should any path fail on one switch, communication will continue via the redundant path on the second switch.

Avid supports an 8-port and a 16-port fibre channel switch.

Avid supports an 8-port and a 16-port fibre channel switch.

FCS - Brocade SilkWorm 3250

FCS - Brocade SilkWorm 3850

Status indicators vary between models.

Gadzoox 2000

Gadzoox 3000 HA

Status indicators vary between models.

MSi PC

Each MSS Networked Storage System cluster has either one or two MSi PCs, depending on the option purchased. Although a system cluster can function without an operational MSi PC, the MSi PC is valuable in that it enables you to monitor all system components. Systems with a second MSi PC have redundant system-monitoring capability.

MSi 2000 - Front Panel

The rear of the unit provides two LAN ports for system communications. There is also a connector for the internal modem and one for an optional analog phone, which you can use when the modem is not in use. Other connectors include a serial, VGA, and USB port. If your MSi PC has the optional Fibre Channel card installed, there is a Fibre Channel port.

MSi 2000 - Rear Panel
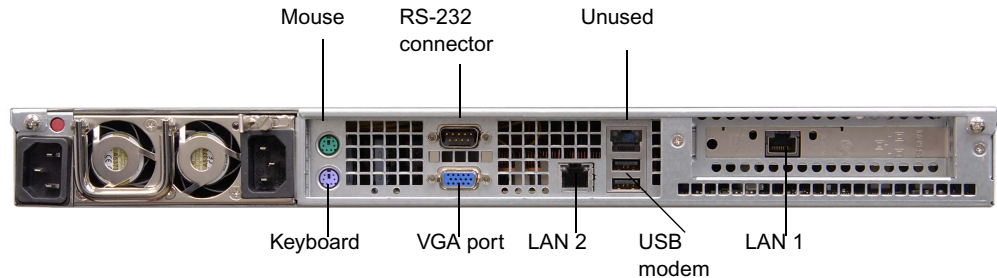
The Avid MediaStream Interface (MSi) application provides a means of playing, recording, rebooting, installing new software, and performing other maintenance activities on the server.

Main MSi Window
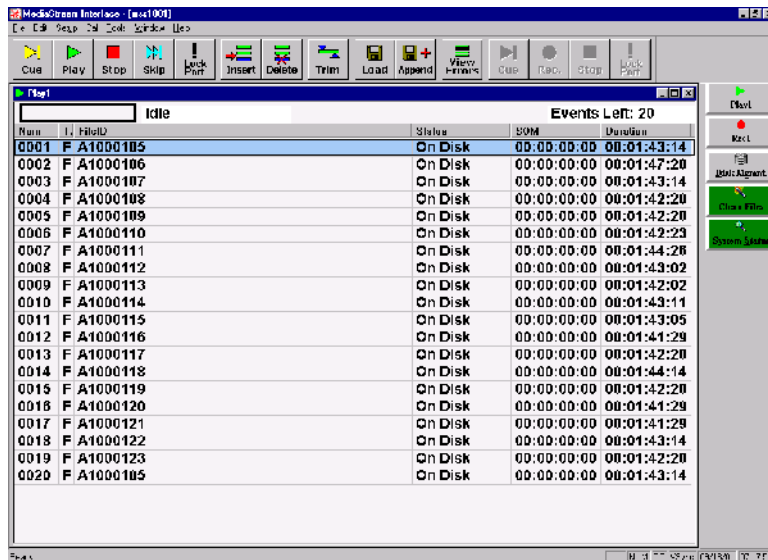
The Host PC communicates with the server components through a LAN connection.

A Lantronix Ethernet-to-serial interface, which is integrated into each server node, provides serial communication to servers, allowing full access to the boot sequence.

Simple Network Management Protocol (SNMP)

The Simple Network Management Protocol is a set of networking protocols designed to provide diagnostic data over networks. The MediaStream 8000 Server employs SNMP to provide a user with easily accessible and regularly updated diagnostic data. Data is fed to the MSi and is displayed graphically in the System Status window of the MSi application.

System Status Window
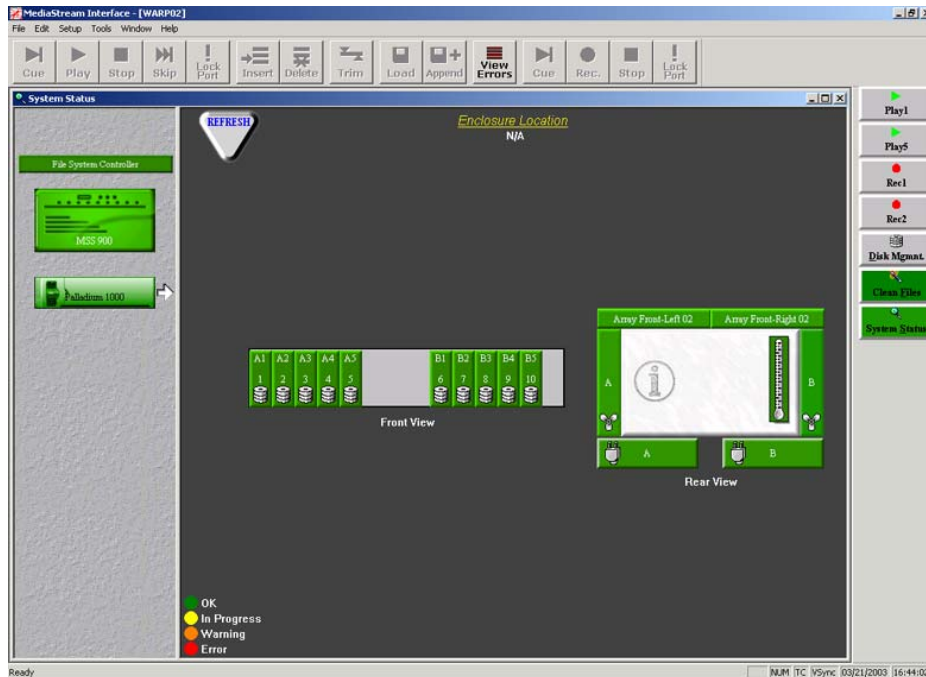
The data is updated automatically at regular intervals (about two minutes) and sent to the MSi. If a trouble condition is reported in any of the server's key operating modules (array, power supply, or cooling fan, the System Status button changes color from *green* (good) to *red* (bad). Clicking the System Status button shows a graphic representation of the system components. The MSS 8000 and the Palladium Store 1000 are shown to the left of the main window. System components that fail are highlighted in the main window.

ConnectPlus 1000 NS Gateway PC

ConnectPlus 1000 Networked Storage (option) is a gateway that provides access to archive storage and to content distribution with other MediaStream Servers. Data transfer is accomplished via Pinnacle's implementation of standard FTP (File Transfer Protocol), providing for easy integration with automation and archive systems.

When configuring one or more Gateway PCs into a networked storage system, special consideration must be given to bandwidth load of the entire system. Each configured gateway must be considered a server node with adequate bandwidth allocated for its use. Failure to consider gateway impact on system bandwidth can have serious system-wide performance implications. See Appendix A for more information on bandwidth calculations.

Connect Plus 1000 - Front Panel
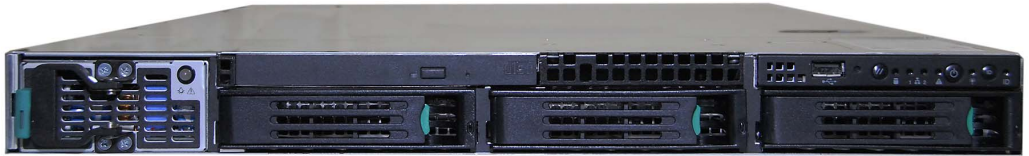
Chapter 3
VLAN Topology

This chapter introduces the VLAN topology used in the MSS Networked Storage System.

Topics covered include:

- Hosts table
- Ethernet topology diagrams
- IP addressing scheme

VLAN Topology

The Networked Storage System uses redundant VLAN Ethernet switches to provide fast and safe fail-over in the event of a break in network connectivity. Each switch provides isolated connections between the server nodes and the two FSCs. The VLAN topology design prevents network loop conditions that could lead to unacceptably long network time-out scenarios during a LAN failure.

To ensure system redundancy, installation must conform explicitly to system design parameters. Each switch must have the current firmware and the correct switch-configuration files installed. With VLAN, a different network is assigned for each server node providing isolated connection paths between the server nodes and the FSCs.

Hosts File

The hosts file provides name resolution for all devices within the cluster. The complete hosts file on the FSCs and MSi PC is quite large and contains all names and addresses for all 16 possible clusters. Each server node contains a hosts file for a given cluster. An abbreviated version of this file (with headings separating devices) follows. Sequential addresses have been skipped, and any entry ending with xx… shows a continued sequence to the next entry.

Aliases

Some device hostnames have been provided with aliases to simplify the connection of devices via Telnet. Connections can be established by using the hostname, LAN address, or any provided alias.

Host Table for Cluster 1

Host Name	LAN Address	Aliases
MSS 8000 (LAN)		
mss0101	10.64.1.3	
mss0102	10.64.2.3	
mss01xx …	10.64.xx.3 …	
mss0116	10.64.16.3	
MSS 8000 (Console)		
con0101	10.64.1.4	
con0102	10.64.2.4	
con01xx …	10.64.xx.4 …	
con0116	10.64.16.4	
FSC1		
fsc0101-1	10.64.1.1	fsc0101A fsc0101
fsc0101B	10.64.21.1	

Host Table for Cluster 1 (Continued)

Host Name	LAN Address	Aliases
fsc0101-2	10.64.2.1	
fsc0101-xx …	10.64.xx.1 …	
fsc0101-16	10.64.16.1	
fsc0101-22	10.64.22.1	
FSC 2		
fsc0102A	10.64.21.2	fsc0102
fsc0102-1	10.64.1.2	fsc0102B
fsc0102-2	10.64.2.2	
fsc0102-xx …	10.64.xx.2 .	
fsc0102-16	10.64.16.2	
fsc0102-22	10.64.22.2	
MSI 1		
msi0101-1	10.64.1.5	msi0101A
msi0101-17	10.64.17.5	msi0101B
msi0101-2	10.64.2.5	
msi0101-xx …	10.64.xx.5 …	
msi0101-16	10.64.16.5	
MSI 2		
msi0102-1	10.64.1.6	msi0102A
msi0102-17	10.64.17.6	msi0102B
msi0102-2	10.64.2.6	
msi0102-xx …	10.64.xx.6 …	

Host Table for Cluster 1 (Continued)

Host Name	LAN Address	Aliases
msi0102-16	10.64.16.6	
Gateway		
gwy0101-1	10.64.1.11	
gwy0101-2	10.64.2.11	
gwy0101-3	10.64.3.11...	
gwy0101-16	10.64.16.11	
gwy0101-21	10.64.21.11	
gwy0102-1	10.64.1.12	
gwy0102-2	10.64.2.12...	
FC Switch		
fcw0101	10.64.21.36	
fcw0102	10.65.17.37	

VLAN Topology Diagram

The following diagram shows a logical Ethernet connections for the 24-port switch. Your installed system ships with color-coded labels and cables to make both wiring and tracing connections easier. This diagram will help you isolate network paths when servicing or troubleshooting the system.

All *tagged* connections are VLAN *logical* connections while *untagged* connections are fixed LAN addresses. For *tagged* VLAN connections, the sequence of addresses has been abbreviated to simplify the diagram. In addition, only the last two octet groups of the address are provided. The complete address includes the 10.xx prefix that designates the cluster.

📖 *The port layout of the 24-port switch is not physically the same as shown here. Make your connections based on the port numbers, not their apparent positions in this diagram.*

VLAN Topology

**Ethernet topology of a Single MSS
Networked Storage Cluster
24 Port Switch**

MSS0101
1.3 LAN (untagged)
1.4 Consol (untagged)

MSS0102
2.3 LAN (untagged)
2.4 Consol (untagged)

MSS0103
3.3 LAN (untagged)
3.4 Consol (untagged)

MSS0104
4.3 LAN (untagged)
4.4 Consol (untagged)

MSS0105
5.3 LAN (untagged)
5.4 Consol (untagged)

MSS0106
6.3 LAN (untagged)
6.4 Consol (untagged)

MSS0107
7.3 LAN (untagged)
7.4 Consol (untagged)

MSS0108
8.3 LAN (untagged)
8.4 Consol (untagged)

1 2 3 4 5 6 7 8 9 10 11 12
HP2524 A   21.34
13 14 15 16 17 18 19 20 21 22 23 24

1 2 3 4 5 6 7 8 9 10 11 12
HP2524 A   17.35
13 14 15 16 17 18 19 20 21 22 23 24

21.0

17.6
(untagged)

17.5
(untagged)

GWY 1
(tagged)
.1.11
.2.11
.3.11
. .....
.16.11
.21.11

GWY0101 (Gateway)

GWY 2
(tagged)
.1.12
.2.12
.3.12
. .....
.16.12
.21.12

GWY0102 (Gateway)

FC Switch A
21.36 (untagged)

MSI 1
(tagged)
.1.5
.2.5
.3.5
. .....
.16.5
.21.5

LAN 2 LAN 1
MSI0101

FC Switch B
17.37 (untagged)

LAN 1 LAN 2
MSI0102

MSI 2
(tagged)
.1.6
.2.6
.3.6
. .....
.16.6
.21.6

128.7 (untagged)

129.8 (untagged)

21.1
(untagged)

21.2
(untagged)

FSC 1
(tagged)
.1.1
.2.1
.3.1
. .....
.16.1
.17.1

LAN 3   LAN 2
FSC0101
LAN 1

22.1
(untagged)

LAN 2   LAN 3
FSC0102
LAN 1

22.2
(untagged)

FSC 2
(tagged)
.1.2
.2.2
.3.2
. .....
.16.2
.17.2

Router A
(tagged)
.1.32
.2.32
.3.32
. .....
.16.32
.17.32
.21.32

Router A

Router B
(tagged)
.1.33
.2.33
.3.33
. .....
.16.33
.17.33
.21.33

Router B

Note:
Ports 9-16 available for
additional MSS-8000
Server Nodes

Networked Storage System I/P Addressing Scheme

IP Address Scheme Example

Network
ID

Cluster
ID

Device
ID

10.xxx.yyy.zzz
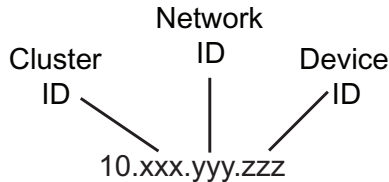
The addressing scheme takes a 32-bit TCP/IP address and breaks it into logical units that can be used to identify cluster, network IDs, and device IDs. The four-octet network address is logically allocated to distinguish between *clusters*, VLAN *networks*, and *device IDs*. All clusters are addressed as follows:

The first octet is always 10. The second octet designates *cluster ID*. Cluster 1 (the most common) is 10.64.xxx.xxx. Addresses 64 to 79 are allocated for the first 16 clusters, with clusters 17 through 32 using addresses 81 to 96. Clusters 33 to 48 use 64 through 79, but the third octet (the network ID, described below) for VLANs in these clusters starts with 65 rather than 1.

Cluster Addressing

Initial Cluster Addresses

Cluster 1	10.64.1	**Cluster 17**	10.81.1	**Cluster 33**	10.64.65
Cluster 2	10.65.1	**Cluster 18**	10.82.1	**Cluster 34**	10.65.65
Cluster 3	10.66.1	**Cluster 19**	10.83.1	**Cluster 35**	10.66.65
Cluster 4	10.67.1	**Cluster 20**	10.84.1	**Cluster 36**	10.67.65
Cluster 5	10.68.1	**Cluster 21**	10.85.1	**Cluster 37**	10.68.65
Cluster 6	10.69.1	**Cluster 22**	10.86.1	**Cluster 38**	10.69.65
Cluster 7	10.70.1	**Cluster 23**	10.87.1	**Cluster 39**	10.70.65
Cluster 8	10.71.1	**Cluster 24**	10.88.1	**Cluster 40**	10.71.65
Cluster 9	10.72.1	**Cluster 25**	10.89.1	**Cluster 41**	10.72.65
Cluster 10	10.73.1	**Cluster 26**	10.90.1	**Cluster 42**	10.73.65

Cluster Addressing (Continued)

Initial Cluster Addresses

Cluster 11	10.74.1	**Cluster 27**	10.91.1	**Cluster 43**	10.74.65
Cluster 12	10.75.1	**Cluster 28**	10.92.1	**Cluster 44**	10.75.65
Cluster 13	10.76.1	**Cluster 29**	10.93.1	**Cluster 45**	10.76.65
Cluster 14	10.77.1	**Cluster 30**	10.94.1	**Cluster 46**	10.77.65
Cluster 15	10.78.1	**Cluster 31**	10.95.1	**Cluster 47**	10.78.65
Cluster 16	10.79.1	**Cluster 32**	10.96.1	**Cluster 48**	10.79.65

The third octet grouping acts as a *network ID,* dividing a cluster into separate VLAN networks, providing isolated communication paths for each server node. Sixteen separate networks are allocated for server node communication with additional network paths available for gateway, MSi PC, switch, and router traffic.

The fourth and final octet grouping acts as a *device ID* specifying the device type and/or number in a storage cluster. The hosts file contains all addresses in all clusters with name resolution for each device in a cluster.

The FSCs, MSi PCs, gateways, and routers employ VLAN Ethernet cards in addition to standard Ethernet NICs to allow communication with devices across multiple networks within a cluster.

Subnet Mask

The network uses the Class C subnet mask of 255.255.255.0, providing up to 256 individual addresses per designated network ID.

Hosts Table and Addressing

Given the above parameters, the following devices are named and addressed in the hosts file on systems components and integrated into the VLAN Switch:

- MSS 8000 server nodes and console ports
- File System Controller 1 and 2
- MSi PC 1 and 2

- Gateways 1 through 8
- Fibre Channel (FC) Switch A and B
- Router A and B

LAN Port Name And Address

Hostname = mss<xx><yy> where xx equals cluster number and yy equals server node ID

e.g., mss0101 is Network 1 Server Node 1 of Cluster 1

LAN address = 10.<xx>.<yy>.3 where xx equals cluster ID and yy equals server node ID

e.g., 10.64.1.3 for Network 1 Server Node 1 of Cluster 1

The device ID (the last octet group) is always 3 for server nodes.

Console Address

Hostname = con<xx><yy> where xx equals cluster number and yy equals server node ID

e.g., con0101 is Network 1 Console Port 1 of Cluster 1

LAN address = 10.<xx>.<yy>.4 where xx equals cluster ID and yy equals console port ID

e.g., 10.64.1.4 for Network 1 Console Port 1 of Cluster 1

The device ID is always 4 for console ports.

File System Controllers (FSCs)

There are two FSCs in each MSS Networked Storage System cluster. Each FSC has three Network Interface Cards (NICs). The first is a VLAN connection to its primary switch. The VLAN card is logically addressed (tagged) for communication with all configured networks on the VLAN switch. This connection allows direct communication between the FSC and each of the server nodes as well as the second FSC, MSi PCs, gateways and Fibre Channel switches. The second is a direct connection to the redundant VLAN Switch. The third is a direct crossover connection to the second FSC.

The convention for naming and addressing the three NICs is as follows:

Hostname

Hostname = fsc<xx><yy>-<z> where xx equals cluster number, yy equals FSC ID (FSC A is "01" while FSC B is FSC "02") and z is Network ID.

e.g., fsc0101-3 is FSC A of Cluster 1 on Network ID 3

LAN 1 Connection

LAN address = 10.<xx>.<22>.<z> where xx equals cluster ID and z is either "1" for FSC A or "2" for FSC B.

e.g., 10.64.22.1 for FSC A on Cluster 1

This is the crossover connection between the two FSCs.

LAN 2 Connection

LAN address = 10.<xx>.<21>.<z> where xx equals cluster ID, and z is either "1" for FSC A or "2" for FSC B.

e.g., 10.64.21.2 for FSC B on Cluster 1

LAN 3 Connection

LAN address = 10.<xx>.<yy>.<z> where xx equals cluster ID, yy equals Network ID and z is either "1" for FSC A or "2" for FSC B.

e.g., 10.64.3.1 is FSC A of Cluster 1 on Network ID 3

The VLAN card is configured for 17 logical addresses (from Network ID 1 to 17). It in effect creates a "Virtual" Network Interface Card for each address. The hosts file for the VLAN port on the FSC will include a hostname and LAN address for each of these.

MSi PCs

A MSS Networked Storage System cluster will always have at least one MSi PC configured but may have a second unit installed for redundant monitoring of the system. Each MSi PC has one tagged VLAN NIC and one conventional Ethernet card installed. The VLAN connection is for direct connection to the PCs primary VLAN switch while the Ethernet port is for redundant connection to the secondary VLAN switch. The convention for naming and addressing the two NICs is as follows:

Tagged VLAN Connection

Hostname = msi<xx><yy>-<z> where xx equals cluster number, yy equals MSi ID (MSi 1 is designated "01" while MSi 2 is designated "02") and z is network ID.

e.g., msi0101-1 is MSi 1 of Cluster 1 on Network ID 1

LAN address = 10.<xx>.<yy>.<z> where xx equals cluster ID and yy equals network ID; and z is either "5" for MSi 1 or "6" for MSi 2.

e.g., 10.64.3.5 for Primary MSi on Network ID 3

The VLAN card is configured for 17 logical addresses (from Network ID 1 to 16 plus Network ID 21).

Redundant Connection

Hostname = msi<xx><yy>-17 where xx equals cluster number, yy equals MSi ID (MSi 1 is designated "01" while MSi 2 is designated "02")

e.g., msi0101-17 is MSi 1 of Cluster 1 Network ID 17

LAN address = 10.<xx>.17.<y> where xx equals cluster ID and y is either "5" for MSi 1, or "6" for MSi 2.

In all cases the device address is always 5 for MSi 1 or 6 for MSi 2.

Gateways

A MSS Networked Storage System cluster may have optional gateways installed. The gateways allow for content sharing between clusters and/or legacy MediaStream Servers. Up to eight gateways may be configured into a system although a system is usually configured for one or two. Each gateway has a VLAN NIC with three tagged addresses as well as an untagged Ethernet port. The untagged port is available for connection to external networks, not to the system's switches. Since the gateways are not mission-critical on-air components, redundant connections are not needed, and each gateway is connected to only one of the VLAN switches:

Tagged VLAN Connection

Hostname = gwy<xx><yy> where xx equals cluster number and yy equals gateway number; gateways are numbered from 1 to 8.

e.g., GWY0101 = Gateway 1 in Cluster 1

LAN address = 10.<xx>.<yy>.<zz> where xx equals cluster ID, yy equals Network ID, and zz equals device ID. Gateways are ID'd from 11 to 18.

e.g., 10.64.16.11 for Gateway 1 ID 11 on network ID 16

Each gateway has tagged VLAN addresses for network IDs 1 through 16 and 21. Gateway device IDs will always be between 11 and 18 (11 for Gateway 1 and 18 for Gateway 8).

Gigabit Ethernet Connection

Hostname = gwy<xx><yy> where xx equals cluster number, yy equals gateway number; gateways are numbered from 1 to 8.

e.g, GWY0101 = Gateway 1 in Cluster 1

LAN address = 10.<xx>.<yy>.<zz> where xx equals cluster ID, yy equals network ID, and zz equals device ID

e.g., 10.64.128.11 for Gateway 1 in Cluster 1 on Network ID 128

Fibre Channel Switches

A LAN connection is provided for each Fibre Channel switch to the VLAN switches to provide access by the MSi PC for maintenance purposes. Each FC Switch is connected to one of the VLAN switches. It is important to note that redundant connections are not available, and monitoring will only be possible from MSi 1. These connections have been provided as a convenience when servicing the switch.

Hostname = fc<xx><yy> where xx equals cluster number, yy equals FC switch number. Switches are designated A or B.

e.g., FC0101 = FC Switch A in Cluster 1

LAN address = 10.<xx>.<yy>.<zz> where xx equals cluster ID yy equals network ID and zz equals Device ID. Device ID is 36 for FC Switch A and 37 for FC Switch B.

e.g., 10.64.21.36 for FC Switch A in Cluster 1 on Network ID 6. and 10.65.17.37 for FC Switch B on Cluster 1 Network ID 17

FC Switch A can communicate with MSi PC 1 on Network ID 21 while FC Switch B is set to Network ID 17 to allow communication with MSi PC 1 through its direct connection on Network ID 17 with VLAN Switch 2.

Routers

A MSS Network Storage System cluster may be configured with optional routers to allow communication to occur between the cluster devices and an internal LAN in the facility. Each router is configured with a VLAN NIC to allow communication between configured Network IDs and external devices. With redundant routers connected to each switch, redundant communication paths are available to external networks The VLAN addresses are configured as follows:

LAN address = 10.<xx>.<yy>.<z> where xx equals cluster ID, yy equals network ID and z equals router device ID. This is 32 for Router A and 33 for Router B.

Chapter 4

Preparation and Installation

This chapter describes the site preparation and installation process which includes the following tasks:

- Site preparation checklist
- Receiving the Networked Storage System
- Installing system components into racks

About 8 weeks prior to installation, assign a site coordinator. The following table offers guidelines for the site coordinator. For specific information, refer to the appropriate sections in this chapter.

Site Preparation Time Table

Time Frame	Activity
8 weeks prior to installation	Based on the components you have ordered, determine the type of racks and rack-mounting screws you will need and order them.
	Determine what kind of racks you will need.
	Select the location for the MSS 8000. Consider existing electrical outlets and lighting, immovable objects, floor vents, etc.

Site Preparation Time Table (Continued)

Time Frame	Activity
6 weeks prior to installation	Create a site layout plan.
	Schedule with appropriate trades persons to ensure that the site is in compliance with structural, power, interface, and environmental specifications.
	Obtain external cables as necessary. Avid MediaStream provides cables to connect Avid MediaStream server components. (Check with your Avid MediaStream Sales Representative if you plan to attach multiple arrays.) You need to provide external connections to station automation, video, and audio devices. See Appendix B.

Follow these guidelines when preparing your site for the installation

- Allow enough space at the site to accommodate additional servers and arrays should your requirements increase.

- Locate cables away from traffic paths to prevent accidents and equipment failures.

- Allow space for a monitor to connect to the analog output of each decoder.

- Consider space for your MSi PC (racked or adjacent).

- Consider space for other equipment, such as the automation station.

- For proper ventilation of the MSS 8000 component racks, and to ensure enough room to perform periodic maintenance and servicing, install the MSS 8000 components a minimum of 40 inches (1 m) (front and back) from walls or other items that might obstruct airflow or the removal of modules.

Avid MediaStream Support recommends that the equipment racks be anchored at the ceiling or floor or bolted to the wall. Ensure that the racks will be stable when all equipment is loaded into the racks. The center of gravity in a fully loaded rack must be low enough to keep the rack from being top heavy.

This section addresses floor load limits, vibration, and heat dissipation.

Floor Load Limit

The room that will house the MSS 8000 must be able to support the total weight of the various components, as well as the localized weight at each level of your rack or cabinet.

To estimate floor strength requirements, consider the following items:

1. Total weight of the MSS 8000 components and any associated equipment.

2. Total weight of furniture such as desks, chairs, tables, racks, etc.

3. Total approximate weight of the operating personnel.

4. Weight of the moving equipment (such as forklifts and transport dollies).

Ensure that all floors, stairs, and elevators to be used when the server is moved to its destination can support the weight of the server and moving equipment.

Refer any questions regarding the adequacy of floor construction to a qualified structural engineer for evaluation.

Vibration

Vibration, when severe, can cause a slow degradation of mechanical parts and connections and data errors in disk drives. If you suspect that vibration might be a problem, contact Avid MediaStream Technical Support for advice and recommendations.

Heat Dissipation

Consider the heat dissipation by the MSS 8000 components as well as other equipment at the site, individuals working at the site, and lighting to determine whether the existing air conditioning system is adequate, or if an upgrade is necessary.

When estimating heat dissipation, consider the addition of Networked Storage components, should your requirements increase.

The cooling air for the server flows in the front and out the left side of the unit. Make sure that there is enough space between the left side of the server and other equipment in neighboring racks so warm air can escape.

Environmental Considerations

This section covers ideal operating temperature, electromagnetic interference, and electrostatic discharge.

Temperature and Humidity

To ensure that airflow is not impeded, and to ensure adequate space to perform periodic maintenance and servicing, do not place racks closer than one meter to walls or obstructions in the front and back.

For reliable operation, maintain room temperature between 20 and 25 degrees Celsius (68 and 77 degrees Fahrenheit), and relative humidity between 30 and 50

Electromagnetic Interference

The MSS Networked Storage System is designed to reduce susceptibility to radiated and conducted interference. The MSS Networked Storage System conforms to the electromagnetic susceptibility (EMC) standards. Excessive electromagnetic interference can cause a variety of problems. Avid MediaStream Support can advise you about the most common causes of electromagnetic interference.

Electrostatic Discharge

Static electricity at the MSS Networked Storage System location should be within the normal range (lower than 15 KVs). Carpeting or low humidity will facilitate the generation of static electricity, especially in dry and cold climates.

To reduce static electricity, install grounded mats in front of the MSS Networked Storage System. Avid MediaStream Support recommends using a heat evaporating humidifier (and strongly recommends *against* using a cold water atomizer humidifier).

Anti-static spray is *not* recommended because it can enter the intake filters and coat the circuitry. If you must use a spray, apply it while the MSS Networked Storage System components are turned off.

Use the following checklist to schedule activities and to monitor the progress of the site preparation process.

Site Preparation Checklis t

Activity	Date Completed
Have phone lines and modem (data) lines been installed? A direct analog line (not a PBX connection) is required to receive Avid MediaStream Support.	
Has the possible need for lifting/moving equipment been addressed?	
Will the flooring and the installation site itself support the weight of the racks, moving equipment, and personnel? Are doorways and pathways wide enough to accommodate the shipping crate and boxes?	
Has the site layout plan been completed?	
Does the layout show the location for all proposed equipment?	

Site Preparation Checklis (Continued)t

Activity	Date Completed
Have the equipment racks been installed? Are they anchored to the floor and ceiling or bolted to the wall? Have you ensured that the racks will be stable enough to support all installed equipment?	
Is sufficient space provided in front of and behind the racks for operation and service?	
Is space provided for manuals and supplies?	
Is proper and adequate power available at the site for the systems components?	
Are all appropriate uninterruptible power supply (UPS) units on line?	
Have tests been conducted to determine the voltage fluctuations throughout the day?	
Do you have enough power receptacles for any supplemental equipment, such as a tape backup?	
Has interface cabling been properly routed to the installation site?	
Has the installation site been checked for minimum and maximum temperature and relative humidity range?	
Has any problem with excessive vibration, electromagnetic interference, and electrostatic discharge been resolved?	

Receiving Server Components

The server, MSi PC and its monitor, File System Controllers, switches, the array(s) and other components are packaged in separate containers. If your shipment includes the optional Rack Mounting Kit for the MSi PC, you will receive additional boxes that contain the rack-mounting accessories.

When the shipment arrives, check each container against the carrier's shipping documents. Inspect the exterior of each container immediately for mishandling or damage during transit. If any of the containers are damaged, request the carrier's agent be present when the container is opened.

Do not throw anything away until you have found and unpacked all of the components.

To protect the components, leave them in their packaging until you are ready to install them.

Keep the shipping materials. If you have to repackage any of the components, you will need the original shipping materials.

The MSS Networked Storage System components are fragile. Some components can be damaged even when carefully handled. Move components in their original packaging.

The components are packed in containers that can weigh more than 120 pounds (55 kg). Exercise care when moving them to avoid injury.

The server ships in a wooden crate. Ensure that doorways and pathways are wide enough to allow passage. The following table shows the dimensions of the boxes and crates.

Chassis Shipping Box Dimension

Component	Length	Width	Height
File System Controller:	23.5 in (59.7 cm)	34.0 in (86.4 cm)	8.0 in (20.3 cm)
MSi Monitor	19.5 in (49.5 cm)	20.5 in (52.1 cm)	7.25 in (18.4 cm)
MSi Computer	16.75 in (42.5 cm)	19.25 in (48.9 cm)	18.5 in (47 cm)
MSS8000si Serve	35.0 in (88.9 cm)	36.0 in (91.4 cm)	19.0 in (68.6 cm)
Fibre Channel Switch	20.0 in (50.8 cm)	21.75 in (55.2 cm)	9.5 in (24.1 cm)
Palladium Store 1000 Chassis	27.5 in (69.9 cm)	24.75 in (62.9 cm)	14.5 in (36.8 cm)
Palladium Store 1000 Drives (2 boxes)	20.5 in (52.1 cm)	14.5 in (36.8 cm)	11.5 in (29.2 cm)

Use an elevator to move containers. Stairs may result in excess vibration. Leave components in the packaging until you are ready to install them.

Never touch any exposed electrical connectors on the components as they can be damaged by electrostatic discharge (ESD). Never drop or sharply bump the array(s). This can cause immediate or delayed failure of the disk drives, permanent data loss, or intermittent operation.

A server ships in one crate and several boxes. Carefully check all compartments of each box.

To unpack the crate:

1. Remove the wire clips that surround the top of the crate and remove the lid.

2. Remove the front panel, rack ears, cords, and accessories from the pockets around the inside of the crate. Some small items may be in packaging material.

3. On the outside of the crate, unfasten the latches that secure the sides of the crate to its bottom. To unfasten the latches, flip the lever of the latch up, and then turn the lever counter-clockwise.

4. Lift the crate up and over the main server chassis, placing the crate out of the way.

5. Remove all packing foam surrounding the server.

Inspecting the Contents of the Shipment

As you unpack the shipment, account for and inspect all the components:

• Check each container against the packing list to ensure all shipping containers were received.

• Check all packing materials and containers for the missing components. Small components, such as adapters and short cables, can remain undetected in the packing materials.

• Check the packing foam for damage that indicates rough handling during transit.

• Look for broken controls and connectors, dented corners, scratches, bent panels, and loose components.

• Check the exterior of the components for the following signs of shipping damage:

  - Look at the top and sides for dents, warping, or scratches.

  - Check the connector panels for signs of damage (bent or broken connectors, scratches, and so forth).

If you have any problems with the shipment, refer to the claims procedure guidelines.

Claims Procedure Guidelines

If you found any damage, follow these claims procedures.

Some damage may be repaired by replacing the part. In the case of extensive damage, you need to return all of the components to Avid MediaStream Support. Contact your Avid MediaStream representative immediately.

Notify your Avid MediaStream representative if the shipment is incomplete or if any shipment contents are damaged. If damage occurred in transit, also notify the carrier.

> *Avid will arrange for repair or replacement without waiting for settlement of claims against the carrier. If damage occurred during shipping, retain the packing container and packaging materials for inspection.*

Server Repacking Guidelines

To repackage any of the server components for shipment, reverse the appropriate unpacking procedures.

Use the original packing material to repackage the components for shipment. If the packing material is not available, contact your local Avid MediaStream Support Sales and Support Office in the U.S., or contact your Avid MediaStream Support authorized dealer outside the U.S. regarding shipment.

Technical Assistance

If your server is still under warranty:

- Before you call Avid MediaStream Support, record the model and serial numbers of your server. You need to remove the front panel to locate these numbers.

- If you opt to have a replacement part shipped to you, retain the packaging materials for the return shipment of the failed assembly, and follow the instructions on the Return Authorization Form that will be included with the part.

- Customers outside the USA should contact their local dealer or Avid MediaStream Systems representative for assistance in diagnosing a problem and identifying a possible failed assembly.

After the warranty expires, you can purchase a Avid MediaStream Support service contract. Please contact your Avid MediaStream Support Sales Representative for more information. Visit the Avid MediaStream Support Web site for more information about Avid MediaStream Support: www.avid.com.

Installing the MSS Networked Storage System

A rack unit (RU) is the measurement rack manufacturers use to measure the height of equipment mounted in the rack. A rack unit is 4.45 centimeters (1.75 inches). Some rack manufacturers provide an additional hole or other symbol to mark the rack unit, as shown in the following figure.

Because of the weight of the some of the units, installing the MediaStream server and Palladium Store 1000 requires at least two people. A third person may be needed to stabilize and guide the chassis while two others lift and slide the module onto the rack rails

📖 *Rack mounting screws vary. Avid MediaStream does not provide hardware such as mounting screws. See your rack manufacturer for these items.*

Rack Unit
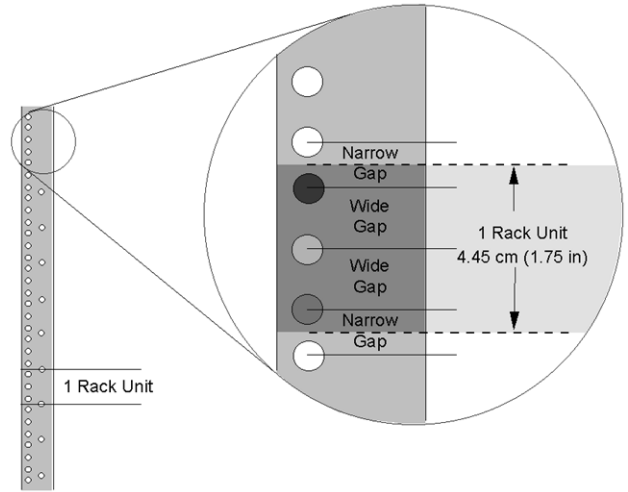
Use the information in the following table to determine the rack space required for the MSS Networked Storage System.

Rack Space Requirements for MS Products

Component	Rack Units	Height	Depth
File System Controller	1	1.75 in (4.4 cm)	28.25 in (71.8 cm)
MSi/Gateway Computer	1	1.75 in (4.4 cm)	17.2in (43.7 cm)
Monitor	10	18 in (45.8 cm)	17.0 in (43.2 cm)
Keyboard	1	1.75 in (4.4 cm)	6.75 in (17.2 cm)
MSS 8000 Server	5	8.75in (22.2 cm)	25.6 in (65.0 cm)
Fibre Channel Switch			
8-Port	1	1.66 in (4.2 cm)	16.3in (41.4 cm)
32-Port	2	3.4 in (8.6 cm)	18.5in (47.0 cm)
Palladium Store 1000	3	5.25 in (13.3 cm)	22 in (55.9 cm)
ConnectPlus 1000	1	1.75 in (4.4 cm)	26 in (66 cm)

For example, a basic MSS Networked Storage System requires a six-foot or two-meter rack. Additional server nodes or storage arrays will require additional racks.

Before installing any components, be sure your rack is stable. Avid MediaStream Support recommends anchoring your rack at the ceiling and the floor. All persons building racks or installing components into racks should have the physical strength, training, and equipment to manipulate heavy objects without causing personal injury.

Each MSS Networked Storage component is labeled. There are always two File System Controllers (FSC A and FSC B), two VLAN Switches (VLAN A and VLAN B), two Fibre Channel Switches (FC A and FC B), and at least one server node (MSS 1) and storage array (Array 1). Additional server nodes and storage arrays have sequential numbers.

Suggested Basic System Rack Installation

File system controller

VLAN switch A
1 RU

1 RU empty space

VLAN switch B
1 RU

ConnectPlus 1000

Monitor

Keyboard

Fibre Channel switch

Palladium Store 1000
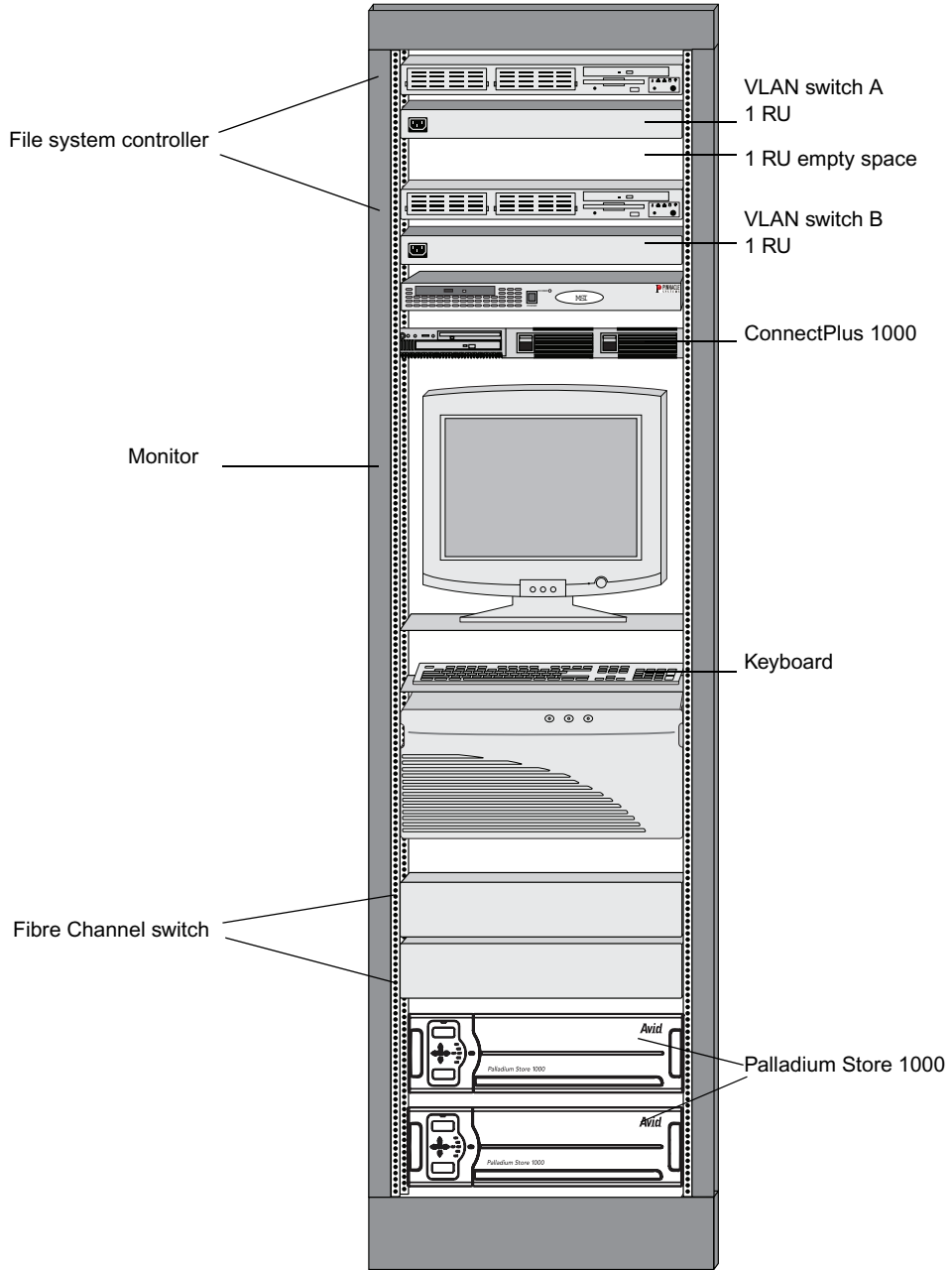
EIA Racks

Make sure that your rack hardware, including protruding screw heads, leaves at least 44.2 cm (17.4 inches) of clearance.

Rack Dimensions
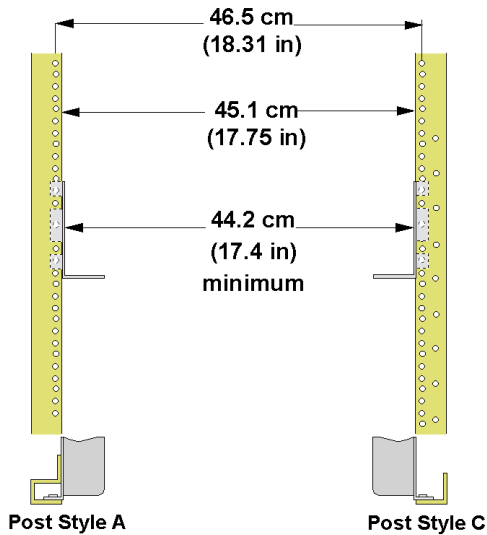
Placing Supports

Avid MediaStream ships two supports and two mounting ears that form a shelf in the equipment rack for the server. The ears are brackets that attach to the front of a server and allow the chassis to be secured to the equipment rack.

The supports will mount anywhere because the holes are spaced one rack unit apart. The center hole (the hole between wide gaps) in a rack unit is generally used to mount the module supports. See the following figure.

Mounting Supports

Rack

The hole at the center of a rack unit is generally used for mounting supports.

Support

Most supports and components align with the bottom of a rack unit.
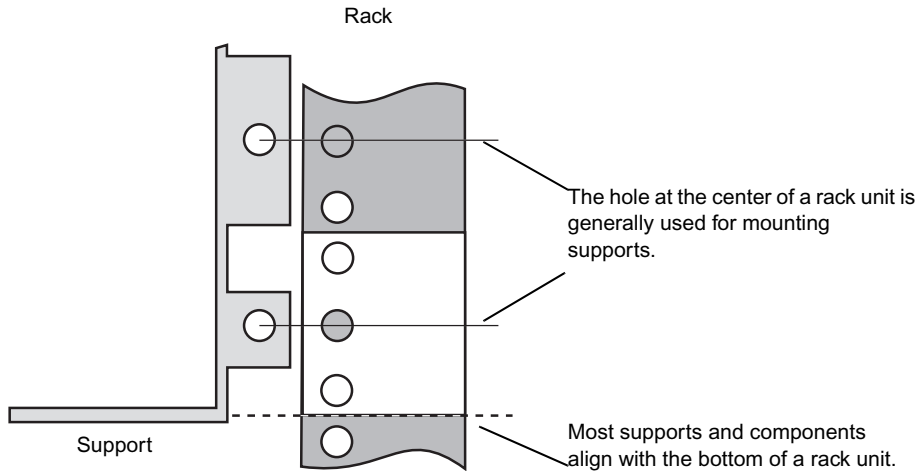
The support hole pattern is designed to fit vertical rack rails, and not interfere with chassis placement.

The MSS 8000 components are secured to the equipment rack by attaching the mounting ears to the vertical rails of the rack. If you install the module supports correctly, the ear holes on the chassis mounting will have clear access to the rack-mounting holes. See the following figure.

Support Placement

Rack

The hole at the center of a rack unit is generally used for mounting supports.

Support

Most supports and components align with the bottom of a rack unit.
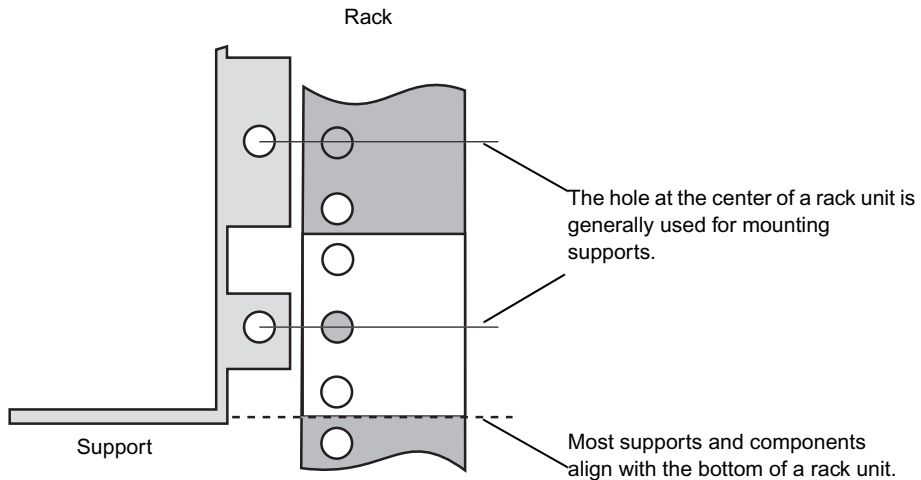
Even-height components add another level of complexity. The following figure shows an example of two odd-height modules (IR and 3R units), and an even-height module (2R units). The odd-height support's rack ear holes should align with holes that are an equal distance from a rack unit center hole. Even-height component mounting holes may align with holes that are an equal distance from the narrow gap between rack units. If you mount the module supports correctly, you should avoid a mounting hole versus rack hole conflict.

Mounting Even and Odd Supports
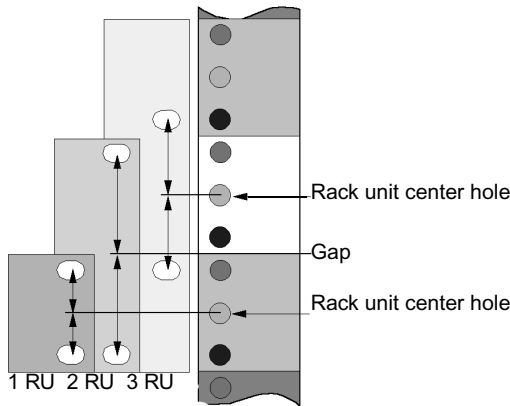
Adjusting Supports

Measure the required space from the top of the rack. Install supports from the bottom of the rack.

The recommended rack depth is from 66.6 to 91.6 cm (26 to 37.4 in.). After reviewing the previous figures for the support vertical placement, adjust the support to fit your rack depth. Use M5 panhead screws to adjust supports. Install the supports to the inside surface of the rack rails as shown in the following figure.

Installing Supports
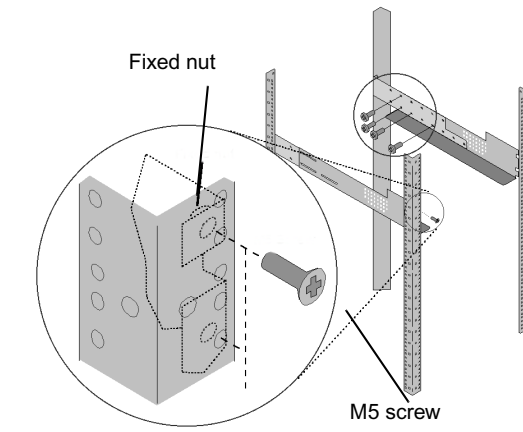
The support mounting hole has an attached threaded *per nut* to receive the M5 screw. The support depth is adjustable to fit racks as shown above. To adjust the supports, loosen the four M5 screws, adjust the depth, and then tighten the screws.

Racking the Storage Array

The storage array comes with its own mounting hardware and instructions.

Avid MediaStream recommends that you have two persons lift the storage array and that you install it as low on the rack as possible.

Racking the Server

The server weighs as much as 25 kg (55 pounds). Installing the server is a two-person job. Occasionally, a third person may be needed to stabilize and guide the chassis while two others lift and slide it into position.

To install the server into the rack:

1. Ensure that you are using either an anti-static wrist strap or mat.

2. Remove the server from the shipping crate.

3. Lift the server and slide it onto the rack rails. Do not insert the chassis all the way into the rack. Instead, insert the chassis about 3/4 of the way onto the rails so that you can access the front of the unit.

4. Detach the shipping cover from the front of the server by removing the screws that secure the cover to the chassis.

📄 *Be careful not to bump or damage any of the components on the LED panel at the top front of the chassis. The front panel, which you install last, protects the components. Save the screws that you removed. You will use these screws to attach the ears onto the server. (The ears will allow the chassis to be secured to the vertical rail of the equipment rack.)*

5. Attach the ears to the sides of the server chassis using the screws that you removed from the shipping cover.

   The ears are packed in the shipping crate with the server.

6. Slide the server chassis all the way into the equipment rack.

Securing Server to Rack
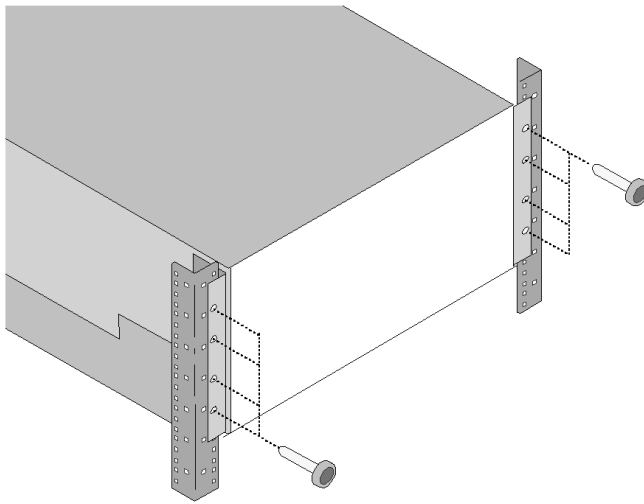
7. Secure the ears of the server chassis to the vertical rack posts as show.

8. Install the front panel onto the front of the chassis. Care must be taken when attaching the front panel to avoid breaking the light pipes for the LED indicators.

Mounting the Audio Interface Panel

Position the audio interface panel on the rear of the rack unit within 91 centimeters (3 feet) of the VME card cage.

Mounting the Audio Interface Panel
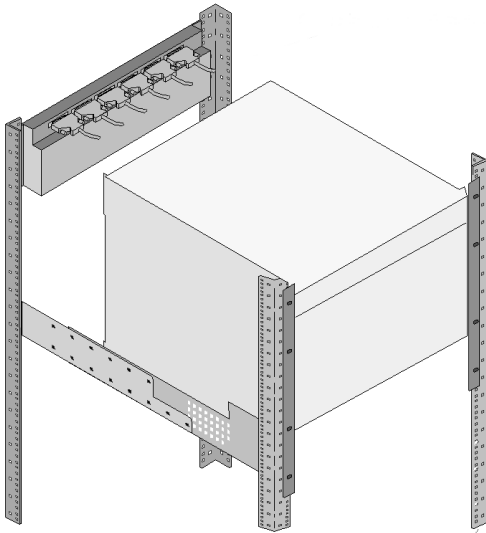
The MSS 8000 server node's 1 RU MSi PC comes with its own mounting hardware and instructions.

Avid recommends that you install a cable management system.Use the 1 RU space between the MSi and the VLANs for cable management.

Rack Mounted MSi PC
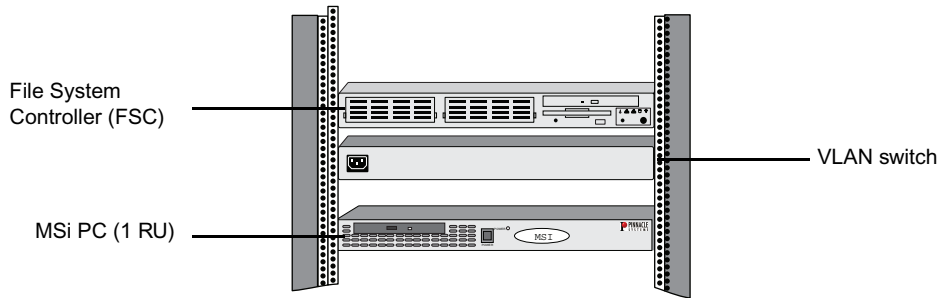
Install the Monitor

Install the MSi PC's flip-up monitor at eye level in the equipment rack.

Position Monitor Platform
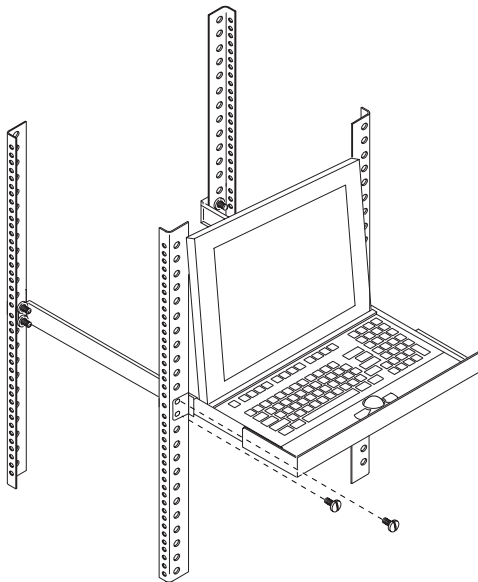
To rack mount the flip-up monitor:

1. Attach the monitor platform to the rack at eye level.

2. Set the monitor on the platform and position the top strip as shown in the following figure. If the strip does not fit your monitor, or you prefer not to use it, you may discard the strip.

Racking the FSCs and VLAN Switches

The FSCs and VLAN Switches come with their own mounting hardware and instructions.

FSC and VLAN Switches
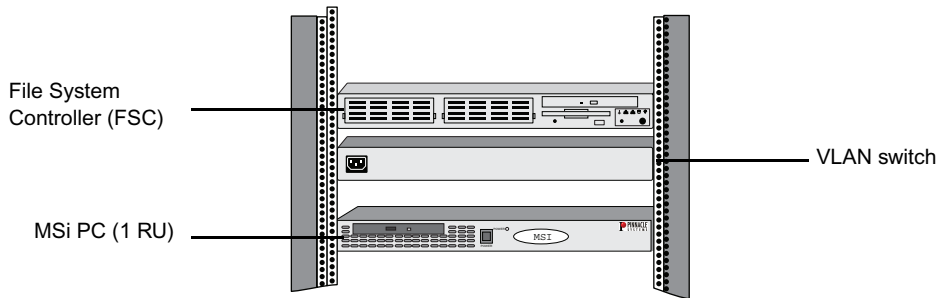
📋 *Because all of the VLAN Switch connections are on the front of the chassis, install these components facing backwards in the rack. For easier connections and better cooling, install a File System Controller on top, a VLAN Switch below it, leave a 1 RU space, and then install the other FSC with the remaining VLAN Switch below it.*

The 1 RU gateway comes with its own mounting hardware and instructions. Your system will have one or more Connect Plus 1000 Gateways. Depending on how many are installed in your system, they may fit in the rack near the FSCs, MSi PC and VLAN switches.

Mounting the Gateway PC
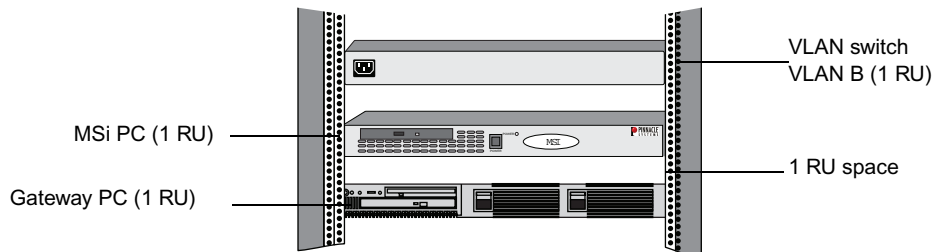
Chapter 5
Connecting System Components

This chapter describes the following system connections

- Connecting storage arrays

- Video connections

- Audio connections

- System and network connections

- Connecting power

Each MSS Networked Storage System ships with a storage system consisting of one or more Palladium Store 1000 arrays.

Palladium Storage 1000 Array (Front View with Bezel Removed)

A drives 1 - 5   Bridge controllers   B drives 1 - 5
                          A and B
              Empty   Empty

| A1 | A2 | A3 | A4 | A5 | | C | C | B1 | B2 | B3 | B4 | B5 | |
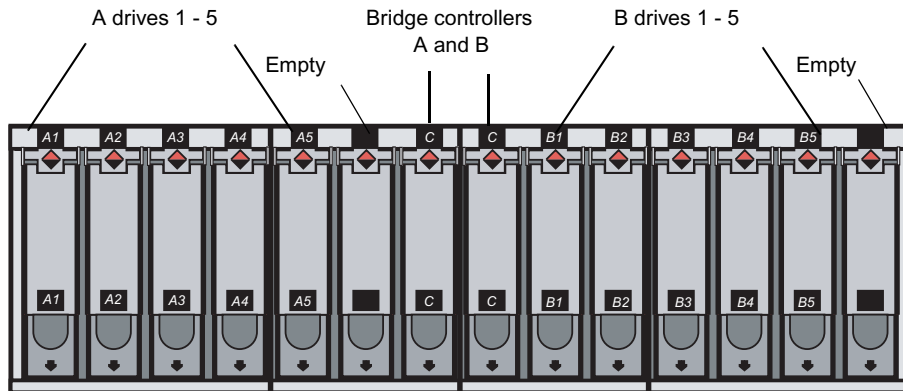
Palladium Storage 1000 Array (Rear View)

Controller (Blue)   Controller (Green)
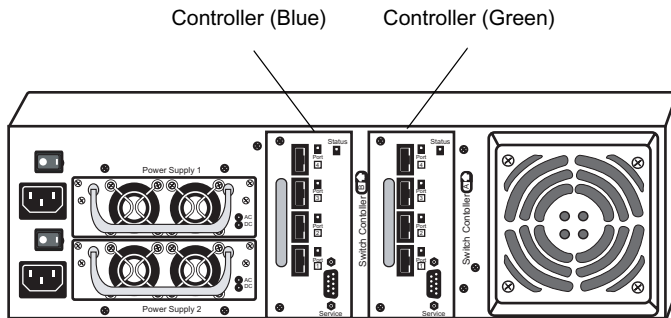
⚡ **Correct connections are essential to proper system operation and to maintain full redundancy. It is possible to make the wrong connections and obtain some degree of functionality but lose redundancy.**

Connecting Video

Avid MediaStream products ship with all of the cables for connecting the MSS 8000 server components. You provide external connections to station automation, video, and audio devices. To prepare inputs and outputs for your MediaStream server, you need to know how many encoder and decoder assemblies you will receive with your server. You need to prepare one set of input cables for each encoder assembly and one set of output cables for each decoder assembly. See Appendix B for connector and cable information.

The following figure shows the video input and output connections on the encoders and decoders, respectively.

Video Connections

Serial digital input (Ch. B)   Serial digital input (Ch A)

Encoder

Serial digital output (Ch A)

Analog output (Ch A)

Dual Decoder

Analog output (Ch. B)

Serial digital output (Ch. B)
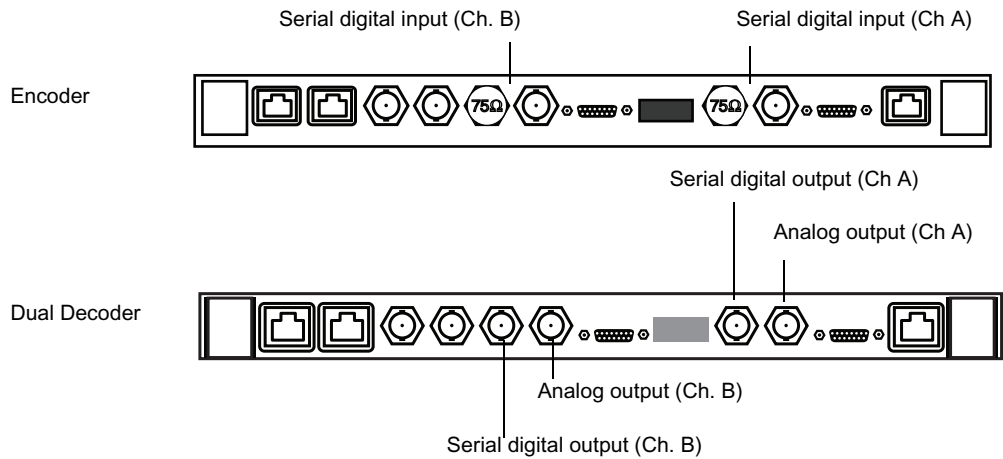
Video Input

Video input to the encoder must be in serial digital form, as specified by the IRU-R BT.601-2 standard. Analog video must be converted into serial digital form to be input to the encoder. This can be accomplished with a third-party analog-to-digital converter module.

A typical video input with a third-party analog-to-digital solution resembles that shown in the following diagram.

Video Convertor to Encoder Connections

Digital   Analog   Analog to serial
output   Source   digitat converters

Station automation   Digital audio input (A)
(video input control)

Encoder

RS-422 (A)   Serial Digital Audio Input   Serial Digital Audio Input

75 Ohm
load
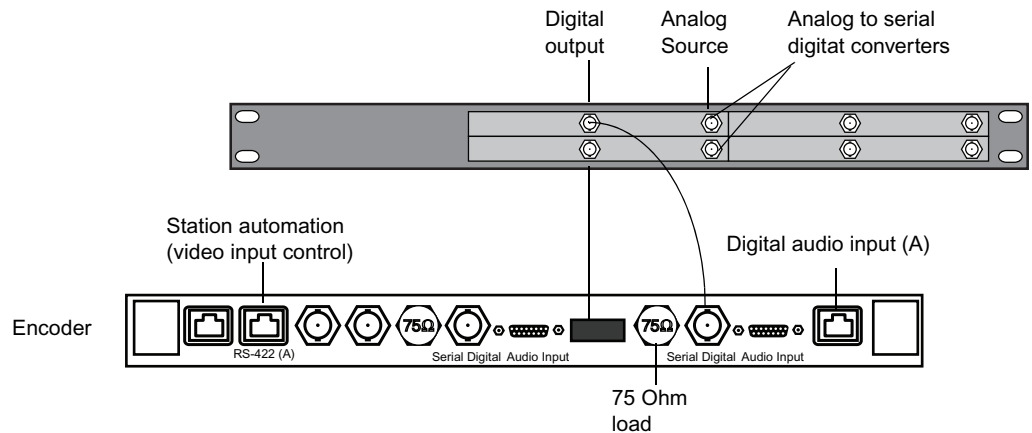
Video Output

Video output from the decoder can be in both serial digital and analog format.

Serial Digital Output

Decoders provide a standard ITU-R BT.601.2 serial digital signal, as well as a composite analog output that is suitable for station monitoring. Audio is embedded with the video track and is also available in AES/EBU and analog via optional XLR or BNC audio output modules. Serial digital may be converted to broadcast-compliant analog composite or component video via an external serial digital-to-analog converter.

The following figure shows serial output from four decoders on a server to a digital-to-analog converter.

Decoder to Video Converter Connections
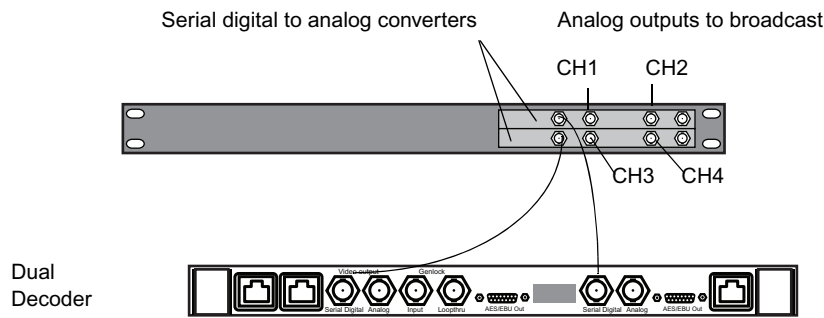
Analog Output

The following figure shows analog output from the server node to broadcast transmission.

Decoder to Analog Broadcast Connections
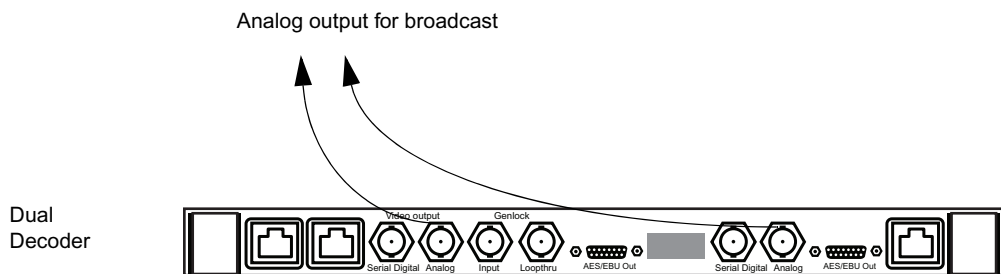
Connecting Genlock (Black Burst)

The Genlock connector on the decoder assemblies allows video output to be synchronized with a station reference signal, also known as *black burst*. Once the station reference signal is made available to the first decoder in the server, additional decoders are connected via loop-through ports.

The last loop-through output should be terminated with a 75-ohm load. With the dual decoder board, termination is internal and automatic. Therefore, if the last board in the loop is a dual decoder board, or your server has only dual decoder boards, you do not need the 75-ohm terminator.

The following figure shows the connections for station reference and loop-through outputs:

Genlock Connections
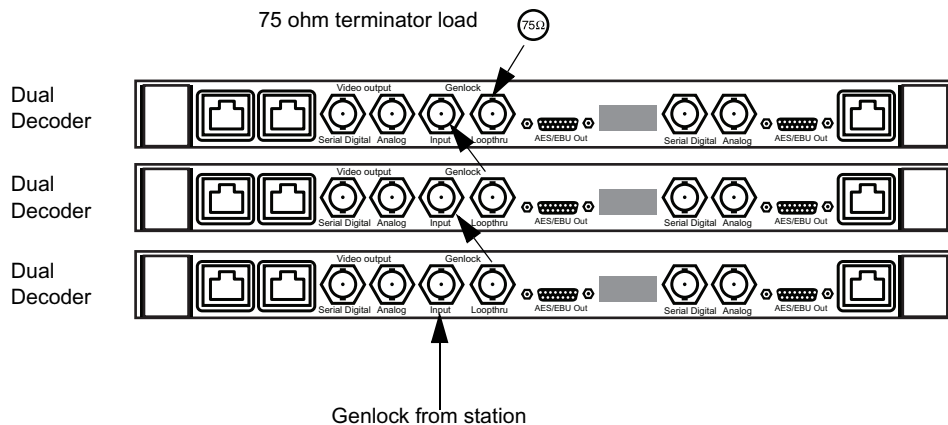
Connecting Audio

To prepare inputs and outputs for your server, you need to know how many encoder and decoder assemblies you will receive with your server. You need to prepare one set of input cables for each encoder assembly and one set of output cables for each decoder assembly. See Appendix B.

Encoders may accept either separate AES-EBU audio or embedded audio.

The following figure shows the audio input and output connections on the encoders and decoders, respectively.

Audio Connections
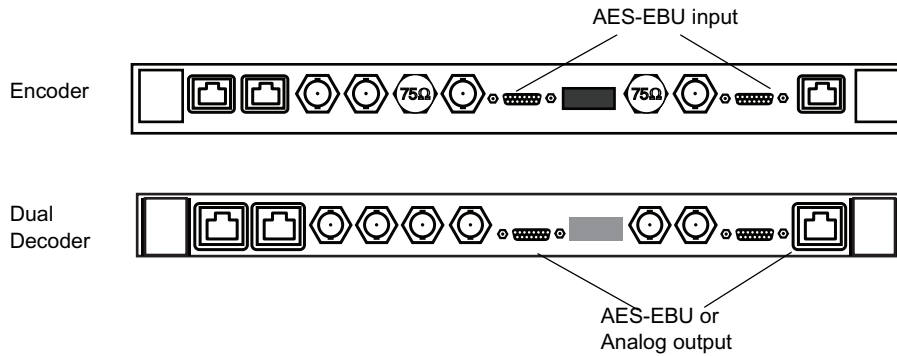
The server node accepts audio input that complies with AES/EBU (digital) standards. The server's encoders receive AES/EBU audio signals through an HD-26 pin connector. Analog audio input may be made compatible with the AES/EBU standard with a third party analog-to-digital solution.

Audio connections vary from station to station. Your station may have digital audio, analog audio, or both. You may use either 75-ohm BNC or XLR, or both.

Audio Interface Panel Options

Avid MediaStream provides optional interface modules for audio input and output. Up to six modules are inserted into a panel, which is mounted on the rear of the equipment rack.

The following figure shows the audio modules in the panel. Each of the modules is described below

Audio Panel
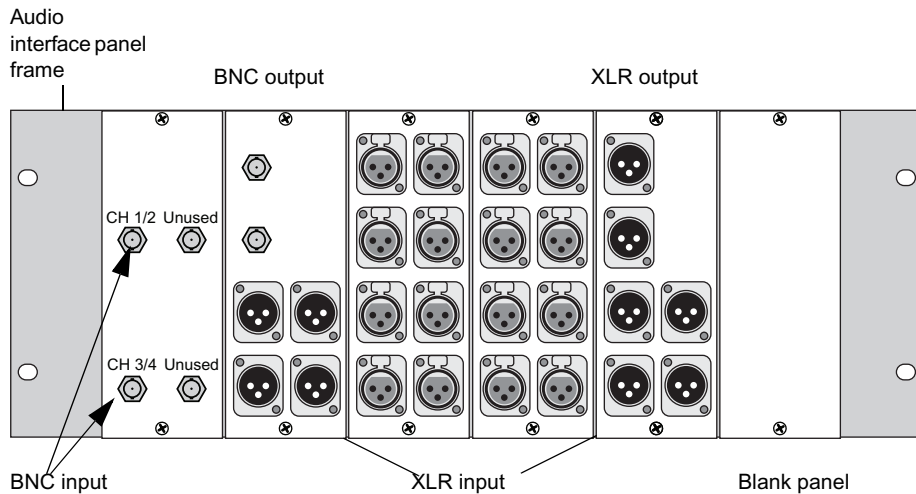
The XLR input audio module is for digital audio input. It provides a 4-channel XLR interface with loopback capability to an encoder (digital audio).

Audio/Input Module
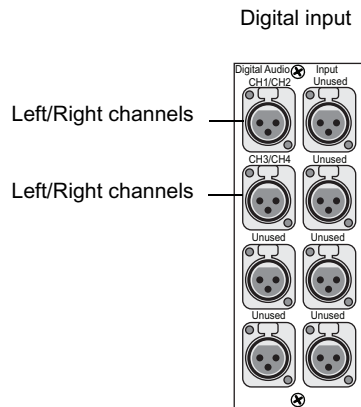
When the server comes from the factory, the audio interface panel is marked for analog input. For digital audio input, apply the stickers supplied with the MSS 8000 to indicate digital audio input connections. If you have properly connected the audio interface panel as described above, it will accept digital audio input.

BNC Input Audio Module

This module is for digital audio input to the encoder. It provides a 4- or 6-channel BNC interface. Connect the audio module to the encoder's Audio Input connector as shown in the following figure.

BNC Input Panel Connected to Encoder
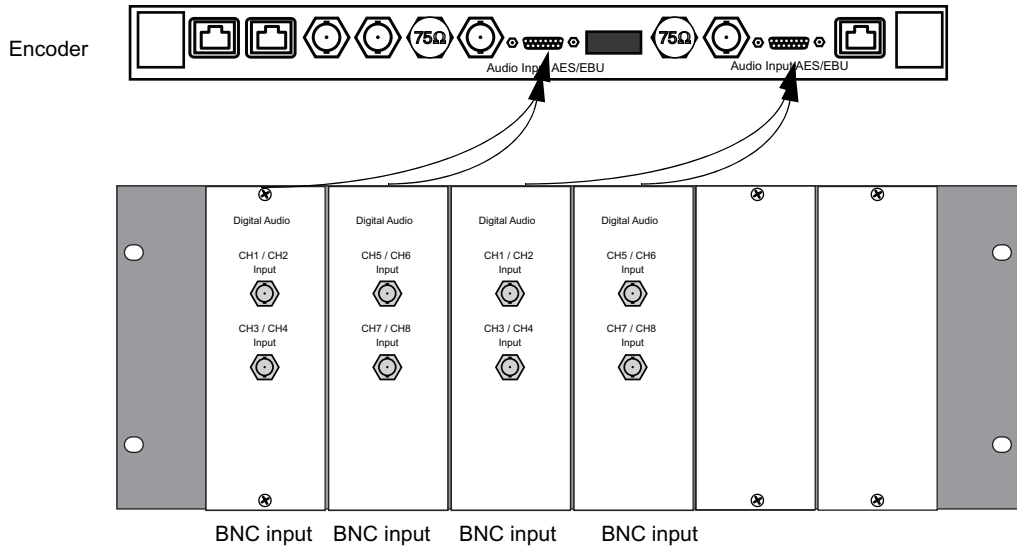
XLR Output Audio Module

This module is for digital and analog audio output from the decoder. It provides two pairs of AES-EBU digital audio output via XLR connectors and two pairs of XLR analog audio output channels. Expansion is provided for one more pair of digital and one more pair of analog audio output channels.

Connect the audio module to the decoder's Audio Output connector. See the following figure for an example of this connection.

XLR Output Panel Connected to Decoder

Dual decoder

Digital Audio Output
CH1/CH2

CH3/CH4

Analog Audio Output
CH1   CH2

Unused   Unused

CH 1 analog audio
output to broadcast
(Left)

XLR output

CH 2 analog audio
output to broadcast
(Right)

BNC Output Audio Module

This module is for analog or digital audio output from the decoder. It provides two pairs of BNC digital audio output and four channels of XLR analog audio output. Expansion is provided for two additional channels of XLR analog audio output.

Connect the audio module to the decoder's Audio Output connector. An example of this connection is shown in the following figure.

BNC Output Panel Connected to Decoder

Dual decoder

Digital Audio Output
CH1/CH2

CH3/CH4

Analog Audio Output
CH1   CH2

Unused   Unused

CH 1 analog audio output to broadcast (Left)

XLR output

CH 2 analog audio output to broadcast (Right)

BNC Output Audio Module

This module is for analog or digital audio output from the decoder. It provides two pairs of BNC digital audio output and four channels of XLR analog audio output. Expansion is provided for two additional channels of XLR analog audio output.

Connect the audio module to the decoder's Audio Output connector. An example of this connection is shown in the following figure.

Six-channel and 8-Channel Audio Module

Some encoder and decoder boards and all dual decoder boards can support six- and eight-channel audio. Connections with the audio XLR input/output are made via a Y-cable. An example of this connection is shown in the following figure.

BNC Output Panel Connected to Decoder
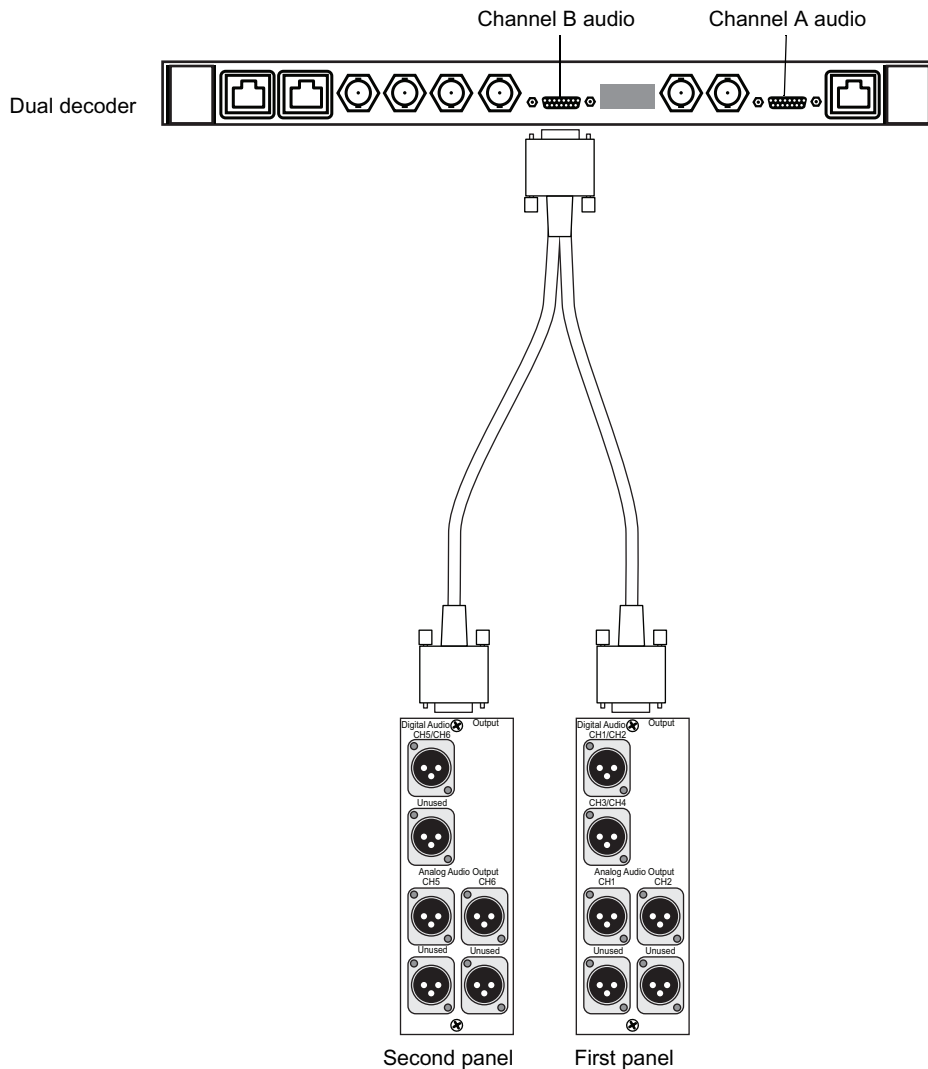
System Connections

At this point, all of the hardware should be mounted in the equipment rack. This section describes connections among the components of a MSS Networked Storage System.

Every cable and connector in the MSS Networked Storage System is marked, which facilitates installation, expansion, and troubleshooting.

To achieve full redundancy, wire your system according to the following instructions. Failure to do so may result in a loss of system redundancy and may cause an unexpected failure.

The following figure illustrates the basic connection arrangements. More detailed instructions for system connections follow.

Connection with FC Switches
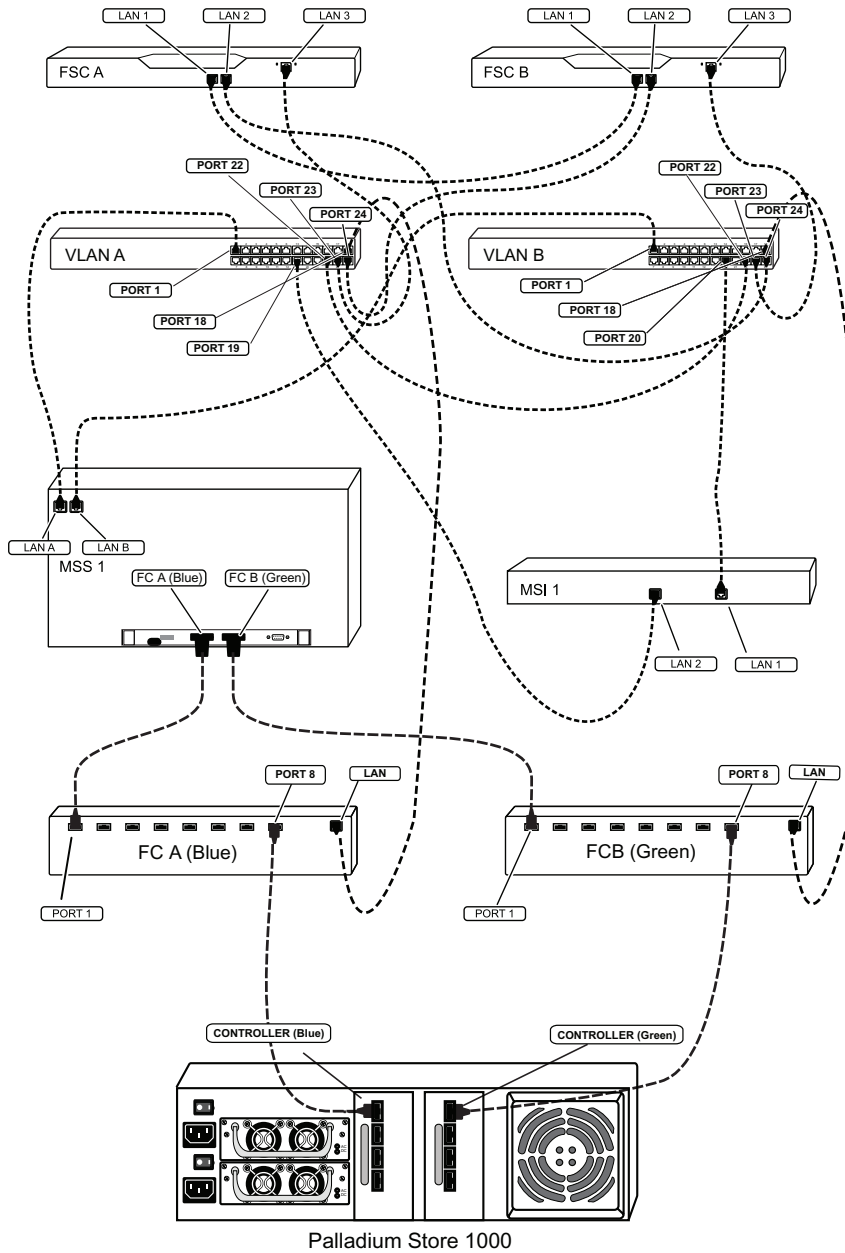
Palladium Store 1000

Connect the FSCs to VLAN Switches

There are two FSCs and two VLAN switches in MSS Networked Storage System, regardless of its size or storage capacity. Current systems ship with two different FSC PCs depending on configuration.

If you have one of the older models (SuperMicro or the IBM 335), see Appendix D.

FSC 40

The following figure represents the FSC 40 and VLAN switches as installed in an equipment rack in their recommended positions. Note the location of the LAN and PORT connections.

FSC 40 to VLAN Connections

Connect the FSCs and VLAN switches as follows. Use the instructions below as a checklist to verify each cable connection.

1. Locate cables 1, 2, 3, 4, 5, and 10.

2. Connect cable 1 (CBL 1).

The FSC A end goes to LAN 1 on FSC A.

The FSC B end goes to LAN 1 on FSC B.

3. Connect cable 2 (CBL 2).

The FSC A end goes to LAN 2 on FSC A.

The VLAN B end goes to PORT 24 on VLAN B.

4. Connect cable 3 (CBL 3).

The FSC A end goes to LAN 3 on FSC A.

The VLAN A end goes to PORT 23 on VLAN A.

5. Connect cable 4 (CBL 4).

The FSC B end goes to LAN 2 on FSC B.

The VLAN A end goes to PORT 24 on VLAN A.

6. Connect cable 5 (CBL 5).

The FSC B end goes to LAN 3 on FSC B.

The VLAN B end goes to PORT 23 on VLAN B.

7. Connect cable 10 (CBL 10).

The VLAN A end goes to PORT 22 on VLAN A.

The VLAN B end goes to PORT 22 on VLAN B.

FSC 100

The following figure represents the FSC 100 and VLAN switches as installed in an equipment rack in their recommended positions.

Note the location of the LAN and PORT connections.

FSC 100 to VLAN Connections

Connect the FSCs and VLAN switches as follows. Use the instructions below as a checklist to verify each cable connection.

1. Locate cables 1, 2, 3, 4, 5, and 10.

2. Connect cable 1 (CBL 1).

   The FSC A end goes to LAN 1 on FSC A.

   The FSC B end goes to LAN 1 on FSC B.

3. Connect cable 2 (CBL 2).

   The FSC A end goes to LAN 2 on FSC A.

   The VLAN B end goes to PORT 24 on VLAN B.

4. Connect cable 3 (CBL 3).

   The FSC A end goes to LAN 3 on FSC A.

   The VLAN A end goes to PORT 23 on VLAN A.

5. Connect cable 4 (CBL 4).

The FSC B end goes to LAN 2 on FSC B.

The VLAN A end goes to PORT 24 on VLAN A.

6. Connect cable 5 (CBL 5).

The FSC B end goes to LAN 3 on FSC B.

The VLAN B end goes to PORT 23 on VLAN B.

7. Connect cable 10 (CBL 10).

The VLAN A end goes to PORT 22 on VLAN A.

The VLAN B end goes to PORT 22 on VLAN B.

Connect the MSi PC to the VLAN Switches

There are always two VLAN switches but there may be one or two MSi PCs on your MSS Networked Storage System. The following figure represents your VLAN switches and one MSi PC as installed in an equipment rack in their recommended positions. Note the location if the LAN and port connections.

VLAN to MSi PC Connections
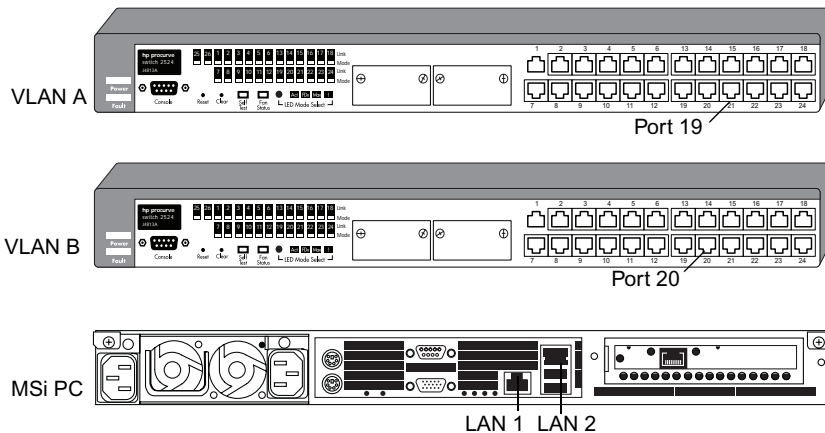
Connect the MSi PC and VLAN switches as follows. Use the instructions below as a checklist to verify each cable connection.

1. Locate cables 6 and 7.

2. Connect cable 6 (CBL 6).

The MSI 1 end goes to LAN 1 on MSI 1.

The VLAN B end goes to PORT 20 on VLAN B.

3. Connect cable 7 (CBL 7).

> The MSI 1 end goes to LAN 2 on MSI 1.

> The VLAN A end goes to PORT 19 on VLAN A.

Connect the ConnectPlus 1000 Gateway PC to the VLAN Switches

While the ConnectPlus 1000 Gateway PC is optional, virtually all Networked Storage Systems will have at least one Gateway PC installed. Detailed connection and configuration information are provided in the ConnectPlus 1000 Networked Storage Installation and Operations Guide. The Gateway PC has four RJ-45 connectors on the rear panel. The top left is the VLAN port for system connection (see the following figure). As the Gateway PC is not an on-air mission-critical component, redundant connections are not provided. Connect Gateway PC 1 to VLAN A, Port 17. Connect Gateway PC 2 to VLAN B, Port 17.

A Gigabit Ethernet PCI card is available to the right of these connections. Use this port for connection to your WAN/LAN infrastructure (see Appendix C for information on system interconnection).

VLAN to Gateway Connections
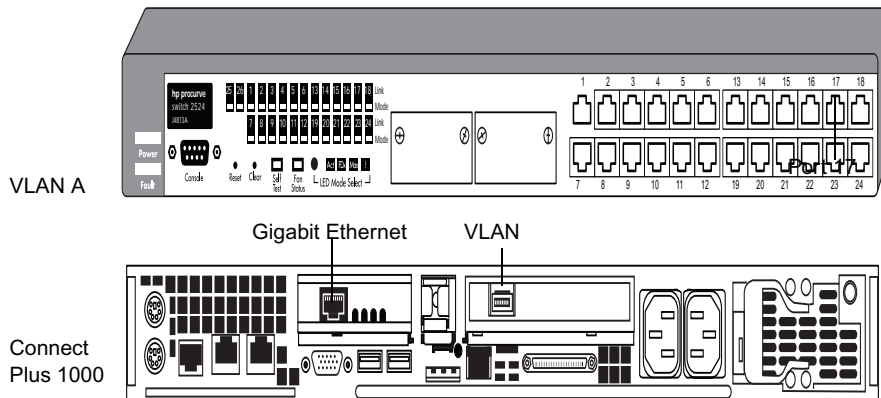
Keyboard, Video and Mouse Connections

The MSS Networked Storage System ships with a four-port Keyboard Video Mouse (KVM) switch. This switch allows you to use a single keyboard, VGA monitor, and mouse to monitor the startup and operation of the MSS Networked Storage System.

KVM Switch Connections

On the back of the KVM switch there are four sets of connectors as shown in the following figure. These connect to the keyboard, monitor (VGA), and mouse ports on the two File System Controllers and the MSi PC as shown below. Cables are supplied to connect the ports on the FSCs and MSi PC to the KVM switch.

KVM Switch Connections
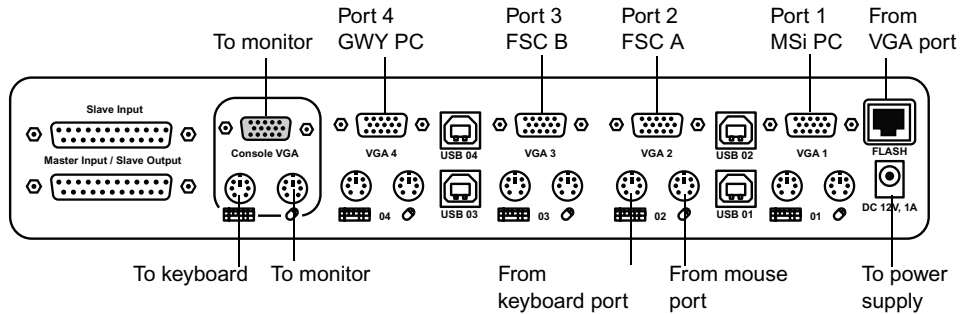
Connect FSC A to the right-most set of connectors. Connect FSC B next to it.

FSC 40 Keyboard, Video and Mouse Connections
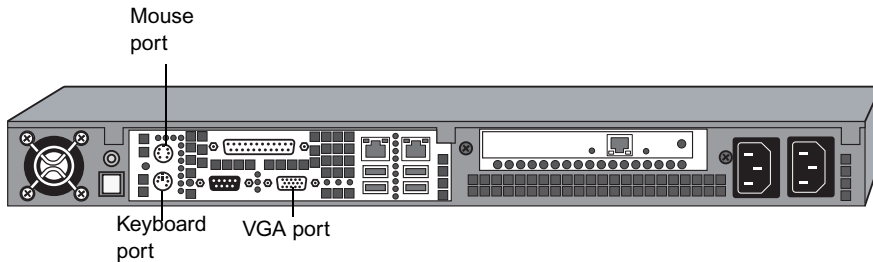
FSC 80 Keyboard, Video and Mouse Connections

FSC 100 Keyboard, Video and Mouse Connections

VGA port   Mouse/keyboard port
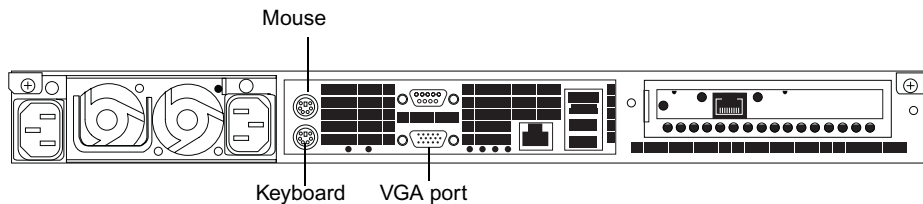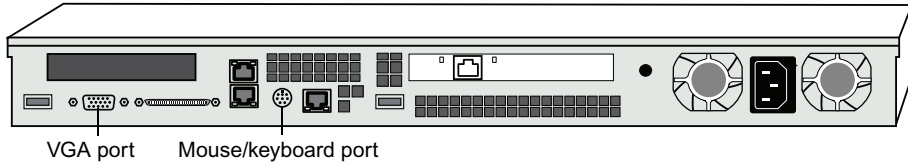
📄 *The IBM 335 PC comes with an optional C2T Output Cable adapter. One end connects from the C2T Out connector on the Back Panel. The cable provides breakout for VGA, and PS-2 Mouse and Keyboard connections.*

Connect the MSi PC to the third set of connectors. The left set can be used for the Gateway PC.

📄 *The MSi PC comes with a Mouse Keyboard Y adapter that breaks out into separate PS-2 keyboard and mouse connections.*

MSi PC Keyboard, Video and Mouse Connections
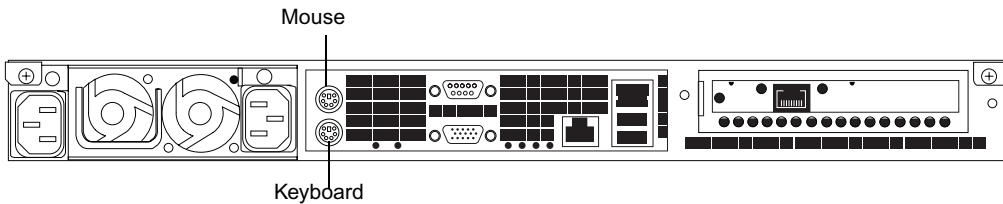
Mouse

Keyboard

Connect your VGA monitor to the left connector on the back of the KVM Switch. Connect the KVM switch's power supply to its port. Connect your keyboard and mouse to their respective connectors on the front of the KVM Switch.

When your system is running, press the selector switch to toggle among the FSCs and MSi PC. See the following figure.

KVM Switch Operation

Port 1   Port 2   Port 3   Port 4
MSi PC   FSC A   FSC B   available
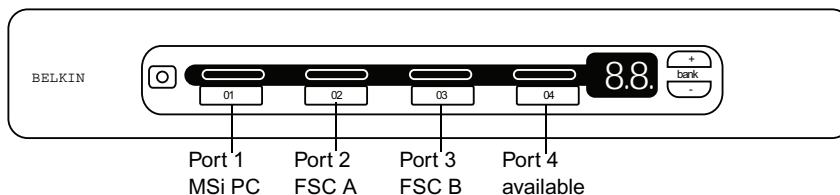
When you have FSC A selected, you will see that component on your VGA monitor and can control it with the keyboard and mouse.

Up-Conversion Connection

For more information regarding the pin-outs on the serial Y-cable to the automation see "Serial Y-Cable to Automation Remote Control and Converter" on page 311.

The following figure illustrates the connections for an up-conversion (SD to HD conversion).

Up-conversion Diagram
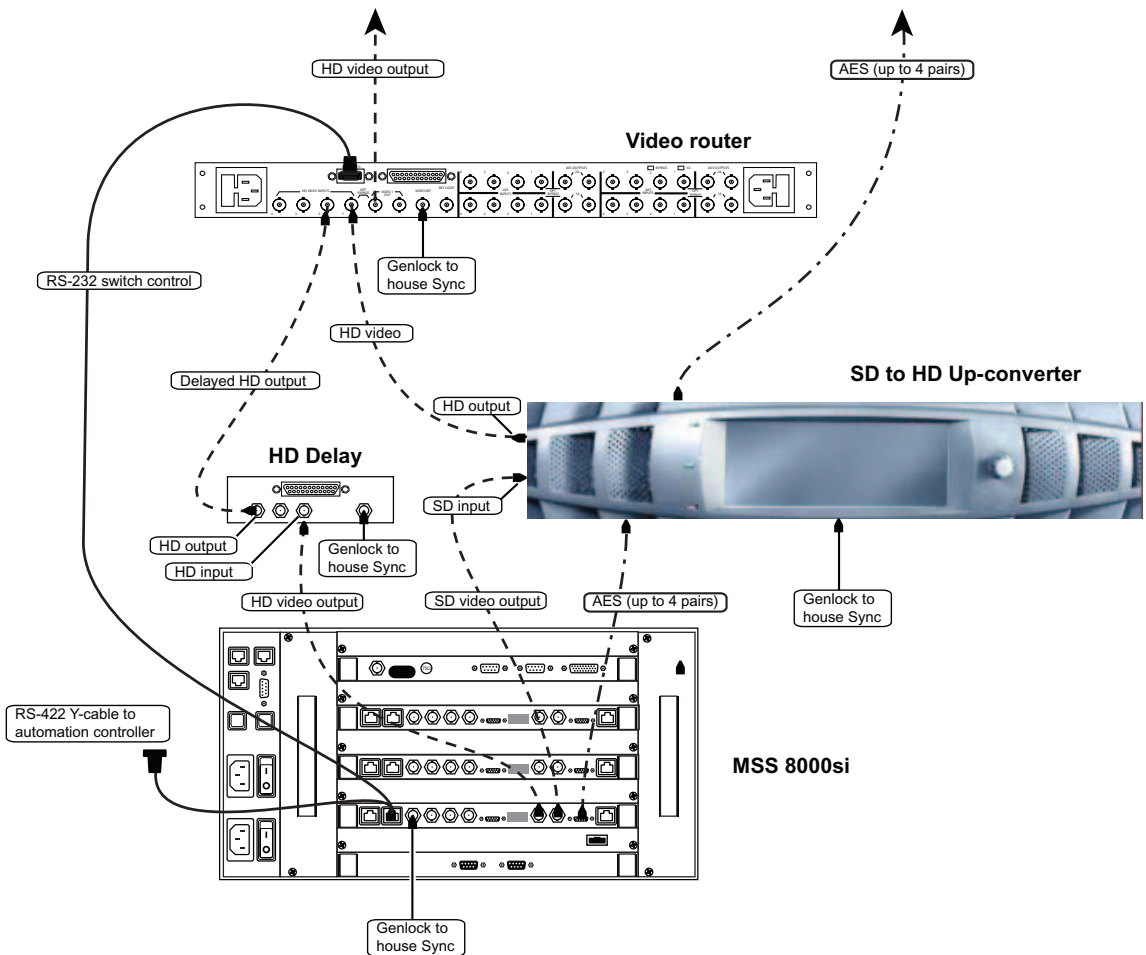
Down-Conversion Connection

The following figure illustrates the connections for an down-conversion (HD to SD conversion).

Down-conversion Diagram
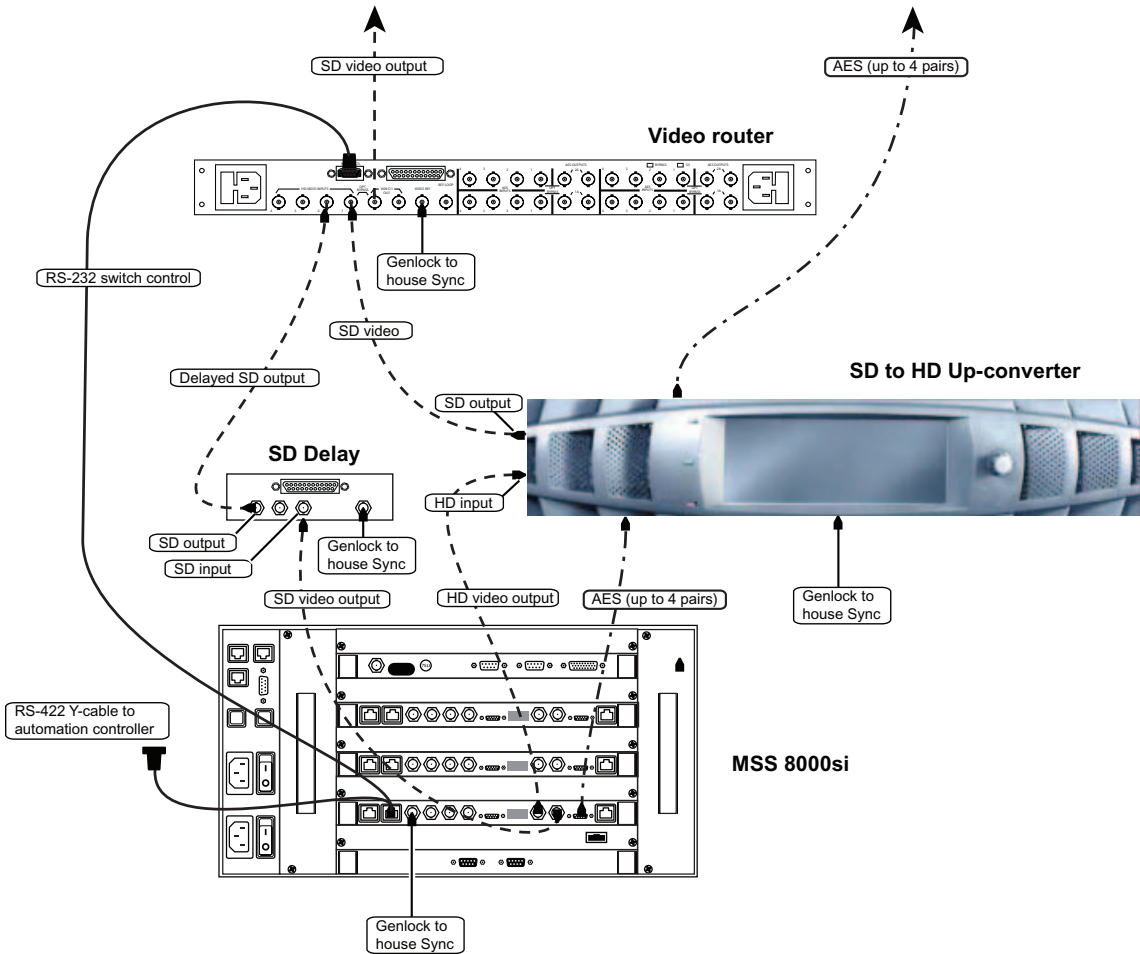
Other MSi PC Connections

The non-network-related connections on the MSi PC are industry standard. Make the following connections:

1. Connect your analog phone line to the modem connector indicated (right).

2. To access a server node while the VLAN is down (and for no other purpose), connect the RS-232 cable from the MSi PC to the corresponding connector on the server node.

MSi PC Connections

VLAN to Server Node Connections

Port 1

VLAN A

Port 1

VLAN B

LAN 1   LAN 2

MSS 8000
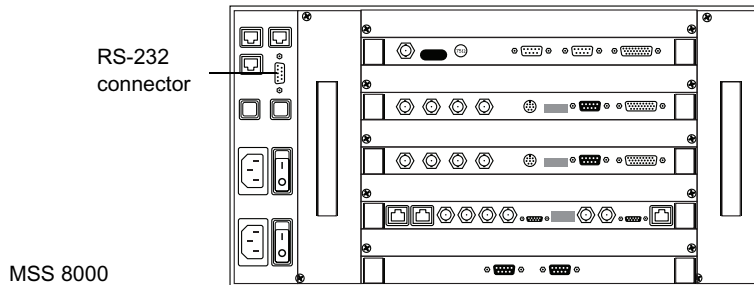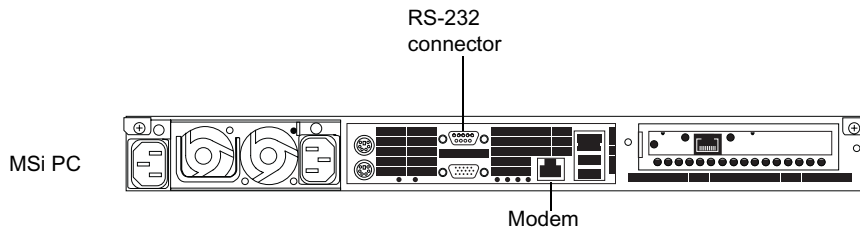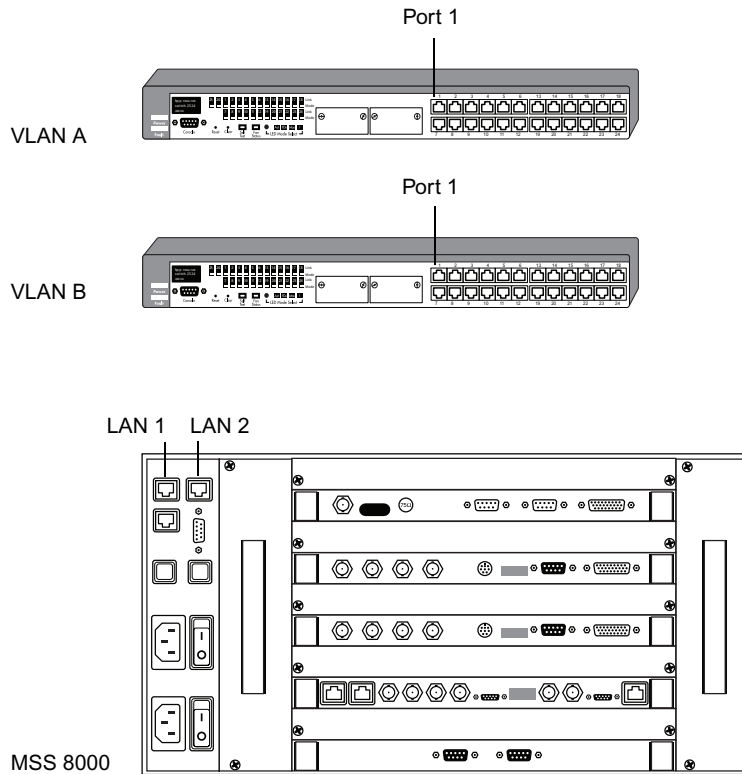
There are always two VLAN switches, but there may be from one-to-sixteen server nodes on your MSS Networked Storage System. The following figure represents your VLAN switches and one server node as installed in their recommended positions. Note the location of the PORT and LAN connections involved in connecting these three components.

Connect the VLAN switches to the server node (in a system with only one server node) as follows. Use the instructions below as a checklist to verify each cable connection.

1. Locate cables 20 and 21.

2. Connect cable 20 (CBL 20).

   The VLAN A end goes to PORT 1 on VLAN A.

   The MSS 1 end goes to LAN A on MSS 1.

3. Connect cable 21 (CBL 21).

   The VLAN B end goes to PORT 1 on VLAN B.

   The MSS 1 end goes to LAN B on MSS 1.

There may be from one-to-sixteen server nodes on your MSS Networked Storage System. Two Fibre Channel switches are require for connection to the array(s). The following figure represents your server node and Fibre Channel switches as installed in their recommended positions. Note the location of the LAN and port connections involved in connecting these three components, and make sure all SFP modules are firmly seated in the fibre channel ports.

📖 *The Gadzoox 3000 HA switch is shown in this and the following examples, but the same guidelines apply to all Fibre Channel switches used with the MSS.*

Server Node to Fibre Channel Switch Connections
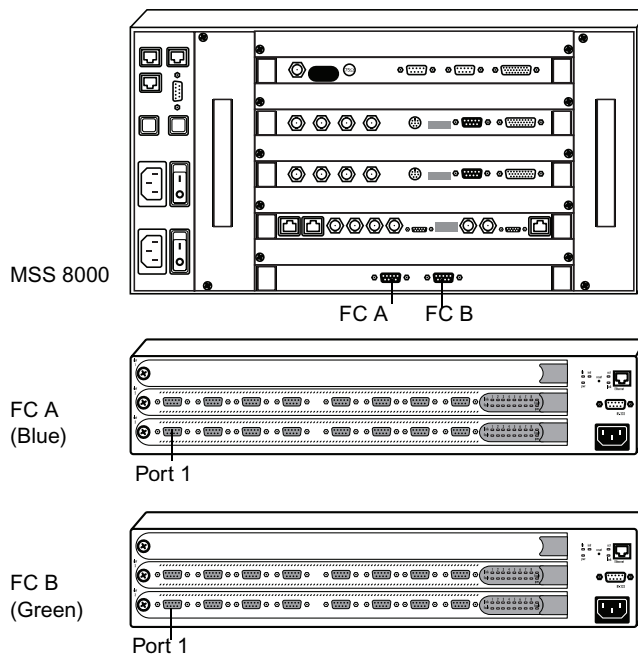
Connect the server node to the Fibre Channel switches. Use the instructions below as a checklist to verify each cable connection.

1. Locate cables 22 and 23.

    Connect cable 22 (CBL 22).

    The MSS end goes to FC A on MSS 1.

    The FC end goes to PORT 1 on FC A (Gadzoox switch).

2. Connect cable 23 (CBL 23).

    The MSS end goes to FC B on MSS 1.

The FC end goes to PORT 1 on FC B (Gadzoox switch).

📧 *For Brocade Silkworm FC switches, use only ports 0-3 on the 3250 or ports 0-7 on the 3850 for connections to an MSS.*

Fibre Channel switches always come in a redundant pair. The following figure represents your Fibre Channel switches and one storage array as installed in their recommended positions. Note the location of the port and array connections involved in connecting these three components.

Fibre Channel to Storage Array Connections
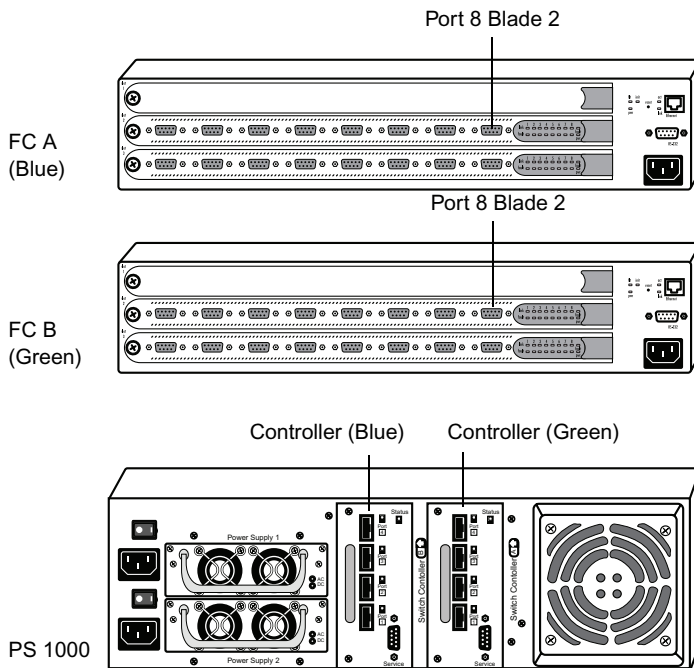
Connect the Fibre Channel switches the storage array (in a system with only one server node) as follows. Use the instructions below as a checklist to verify each cable connection.

1. Locate cables 80 and 81.

2. Connect cable 80 (CBL 80).

   The FC A end goes to PORT 16 on FC A (Gadzoox switch).

   The ARRAY 1 end goes to RAID A1 on ARRAY 1 (Controller Blue, Port 4 on PS-1000).

3. Connect cable 81 (CBL 81).

The FC B end goes to PORT 16 on FC B (Gadzoox switch).

The ARRAY 1 end goes to RAID B1 on ARRAY 1 (Controller Green, Port 4 on PS-1000).

For Brocade Silkworm FC switches, use only ports 4-7 on the 3250 or ports 8-15 on the 3850 for connections to storage arrays.

The Gateway PC connects to the Fibre Channel Switches after all MSS 8000 server node connections have been made. Since the Gateway PC is not a mission-critical device, redundant connections are not provided. The Gateway PC connection is an HSSDC port on right-most PCI card. Connect Gateway PC 1 to FC Switch A and Gateway PC 2 to FC Switch B. Use the first available port to the right of the last MSS 8000 server node connection. The connection to the Switch will be DB-9 or HSSDC depending on the model used in your system.

Complete Gateway PC connection and configuration information is available in the ConnectPlus 1000 Networked Storage Installation and Operations Guide.

Fibre Channel to Gateway Connections
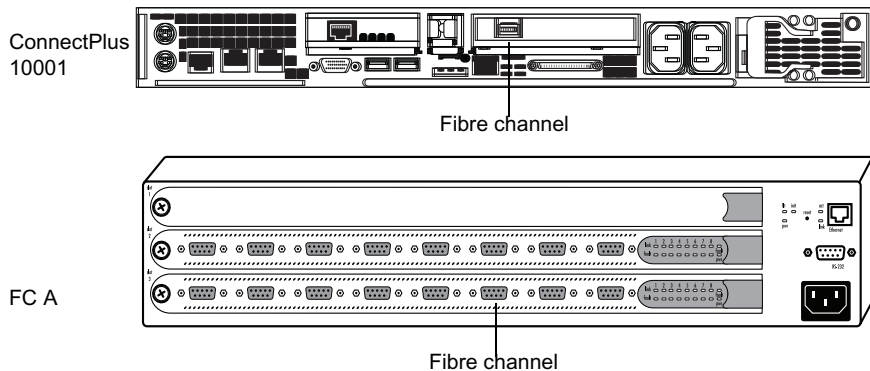
Fibre channel

Fibre channel

For Brocade Silkworm FC switches, use only ports 0-3 on the 3250 or ports 0-7 on the 3850 for connections to a Gateway.

Connecting Power

This section shows how to connect power to the MediaStream Networked Storage System components.

The MediaStream Networked Storage System is designed for full redundancy of all components and functions, however, no system can function without a continuous supply of clean power. Thus much of the advantage of system redundancy is lost unless there are two separate circuits feeding the MediaStream Networked Storage System. Preferably one of those circuits is connected to an Uninterruptible Power Supply (UPS). See UPS Power Requirements later in this chapter.

Two components of the MediaStream Networked Storage System have redundant power supplies: the server node(s) and the storage array(s). If one set of power supplies or fans fails, the other set takes over. The other system components, the File System Controller, VLAN switch, MSi PC, and most models of Fibre Channel switch have only a single power supply. However, all of these, except for the MSi PC, work in pairs to achieve redundancy.

To connect the power cables on each component:

1. Make sure that all power switches are set to the off position.

2. Plug in the power cable on the connector. All components use the same industry-standard power connector as shown in the following figure.

Power Connector
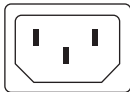
3. Connect the power cables to the power sources. For redundant power operation, provide two separate circuits to which to connect the main and redundant power supplies. Do not connect the main and redundant power supplies to the same circuit.

   The following table lists AC line voltage specifications for the MediaStream Networked Storage System.

AC Line Voltage Requirements

	Maximum Power 120V	Maximum Power 240V	Power in Watts
File System Controller	3A	1.5A	–
VLAN switch	2.4A	1.2A	–

AC Line Voltage Requirements (Continued)

	Maximum Power 120V	Maximum Power 240V	Power in Watts
MSi PC	5.0A	3.0A	–
8000 server node	10.0A	5.0A	595W
Fibre Channel switch, 8 port	1.5A	.75A	100W
Fibre Channel switch, 32 port	3.0A	1.5A	200W
Palladium Store 1000	3.0A	1.5A	250W
Gateway	3.5A	1.75A	–

The line voltage (AC) at the wall power outlet is a function of the local power utility company and the building power distribution network. Voltage outside the operating range of the system can cause intermittent server errors, or a complete shutdown. If required, Avid MediaStream Support, along with your electrician, can determine the current line voltage and make recommendations. Do not use a line voltage conditioner.

UPS Power Requirements

To avoid the loss of critical data, the loss or corruption of video files, and a system reboot due to loss of power, use an Uninterruptible Power System (UPS). Make sure that there are enough outlets of the correct type and at the correct voltage to support all components of the MediaStream Networked Storage System.

Avid MediaStream Support recommends that each installed UPS be of the On Line UPS or Line-Interactive UPS type.

Each UPS must be capable of switching to full load in less than 10 milliseconds after main power is interrupted or data could be lost.

Frequency

Frequency is normally a function of the local power utility company. In rare cases, electrical power is supplied from a motorized generator located within the building. Frequency shifts can cause intermittent system errors or terminal display jitter. If required, Avid MediaStream Support, along with your electrician, can determine the power line frequency and make recommendations.

Power Line Transients

Heavy electrical loads from nearby machinery or equipment (such as elevators or electric welders) can cause intermittent system errors even if that equipment is on a separate circuit breaker. When faced with these conditions, you should provide a separate, completely independent power panel with an isolated ground and circuit breaker coming directly from the main building power source or secondary power source.

Circuit Wiring

The system requires dedicated or individual branch circuits (using separate 20 Amp circuit breakers). There are two reasons for requiring branch circuits. The first reason is to ensure that no other electrical devices are connected to the circuit, thus preventing induced electrical noise or unnecessary tripping of the circuit breaker. The second reason is to ensure that there is enough power to run the server. The lack of a dedicated circuit can cause low voltages and intermittent problems.

You can connect components of the MediaStream Networked Storage System to the branch circuit via plug and receptacle.

Always complete each installation with a compliance check for local electrical codes.

To reduce the possibility of personal injury, receptacles must include a dedicated ground connection that is insulated from the receptacle box. It is important that the receptacle box be grounded with an additional ground connection that is not dedicated (the additional ground can be hard conduit). When installing receptacles, ensure that each receptacle has its own neutral (if required) and ground. Using the same neutral/ground for more than one circuit will cause voltage loss, heat problems, and can result in a fire hazard. A shared neutral conductor that fails open-circuit will result in possible over-voltage damage to equipment. A safety earth ground is required by the National Electrical Code (USA) and most other local, regional, and national codes. In addition to the safety ground, Avid MediaStream Support requires that a dedicated (earth reference) ground be installed as a common reference point for all System components.

Power cords and plugs that cannot be ordered must be fabricated by an electrician to meet local requirements.

Lightening Protection

In some geographic areas, it might be advisable to install lightning protection. In the U.S., the installation of lightning and surge arrestors on power lines is described in the National Electrical Code, Article 280.

Chapter 6
MediaStream Interface (MSi)

This chapter introduces the MediaStream Interface (MSi), a graphical-user interface application that resides on a computer running Windows 2000. Avid MediaStream Support uses the MSi to troubleshoot the MSS Networked Storage System and to install new software and perform other maintenance activities. Although the MSi application is capable of playing and recording video files (also called *clips*), it is intended as a support and diagnostic tool. Avid MediaStream Support uses these features for testing the system.

This chapter describes the following elements and functions:

- MSi Control Panel
- MSi function and appearance
- Recording files to disk
- Playing back files
- Saving and loading playlists
- Trimming file outputs
- Using the Disk Management window
- The Configuration dialog
- The System Status window
- Conducting a telnet session for server node and FSC administration

MSi Control Panel

The MSi provides control for individual Networked Storage System server nodes. A server cluster can have two or more server nodes. Each node provides up to 16 input or output channels and full access to all content stored on the array(s). To access a given server node for control, you must use the MSi Control Panel.

To launch the MSi Control Panel, select MSiControlPanelApplet from the Start menu. The MSi Control Panel is displayed.

MSi Control Panel Window
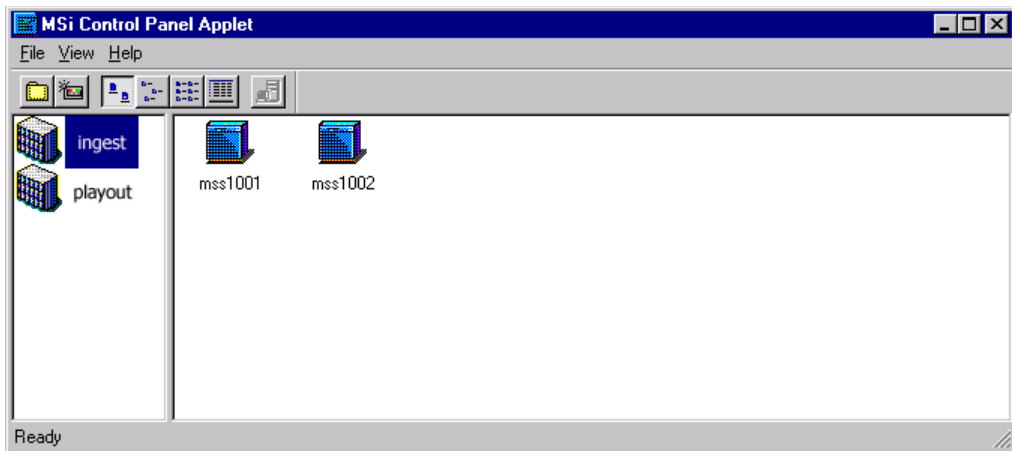
The MSi Control Panel will allow you access to all server nodes in all server clusters available on your network. To access a server node, click the appropriate cluster in the left pane of the application window. The server nodes available for that cluster will appear in the right pane. Double-click the icon for the server node you wish to work on to start the MSi application.

The MSi can only monitor one server node at a time. If the application is already started for another node, you must quit the application first before starting a new session.

Configuring the Control Panel

With the Control Panel, you can monitor clusters in a network and all server nodes on a cluster. The two steps to configuration are:

• Adding a new cluster to the Control Panel
• Adding to a cluster

Adding a New Group

The MSi Control Panel provides access to all server nodes in a cluster. These nodes can be subdivided into cluster Groups, such as ingest and playout server nodes.

To create a new cluster group,

1. Go to File > New Group or press Ctrl+N. The New Group dialog appears as shown in the following figure.

2. Type in the name of the group and click OK.

New Cluster Group Dialog

Adding a New Server Node

New server nodes must be added to the Control Panel in order to gain access to them.

To add a new server node:

1. Select File > New Server. The New Server dialog appears.

New Server Dialog
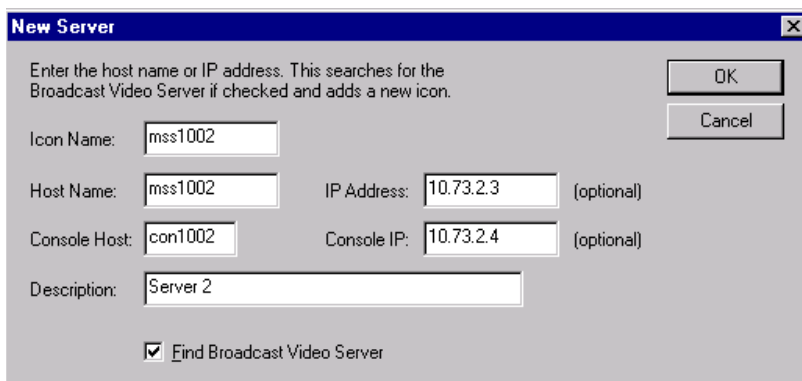
2. Obtain the following information for the node and enter it in the New Server dialog box

- **Icon Name** — The name of the server node icon that appears in the Control Panel should be the same as your Host Name. The Host Name will start with mss followed by two digits corresponding to cluster number and two digits corresponding to server node number. The example above is mss1002 for node 2 of cluster 10

- **Host Name —** Enter the server node's Host Name.

- **IP Address** — Check your host table to find the appropriate host address (see VLAN Topology).

- **Console Host** — The Console Host is the address of the Lantronix module. This port address allows you to view the boot sequence of the MSi. Enter con followed by cluster number and server node number. The example above shows Console Port of Server Node 2 on Cluster 10.

- **Console IP address** — (see VLAN Topology).

- **Description** — An optional descriptive ID for identifying the server.

The host address is listed in the /etc/hosts file.

Deselect the option *Find Broadcast Video Server*. Unless the server is running because having this option selected causes a time-out when you exit the New Server dialog box.

After you define your server, click OK in the dialog box. The server icon appears in the Control Panel.

Changing the Control Panel View

The Control Panel View menu allows you to change the view of the display. You can choose to display the Toolbar and Status bar and change the view of the display to show large or small icons as well as a list or details.

Starting the MSi Application

To start the MSi application, from the Control Panel select File > Launch MSi. The MediaStream Interface window displays. To navigate among the windows in the MSi application, click the appropriate button in the column of buttons to the right of the active window. The tools in the toolbar that do not apply to an active window are grayed out.

To display the System Status window for your server, click the System Status button.

System Status Window

Main Menu

Toolbar

Name of
active window

MSS 8000 icon

PS 1000 icon

Window
selection
buttons

System
status
button
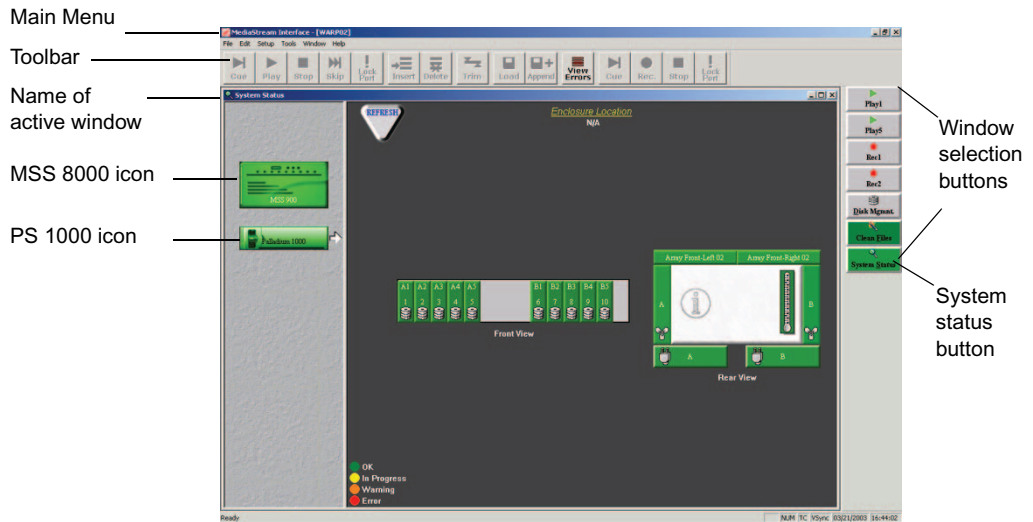
Msi PC and Server Node Communication

The MSi PC communicates to the Networked Storage System through redundant VLAN
Ethernet connections.

The MSS 8000 Lantronix module connects to an internal Ethernet LAN hub providing
connections to the System Controller board's LAN port and RS-232 Console Port for server
administration. The Console Port provides the MSi PC access to system boot and monitoring
via telnet.

The System Controller LAN port provides access to multiple telnet sessions for server nodes
as well as the link for the MSi application.

You will use the Configuration dialog box to define server parameters to the MSi. To open
this dialog box, select Setup > Configuration from the MSi main menu. This dialog box
consists of four panes: Global Configuration, Play Window, Record Window, and Console
(System Administration window).

MediaStream MSi Configuration Dialog Box
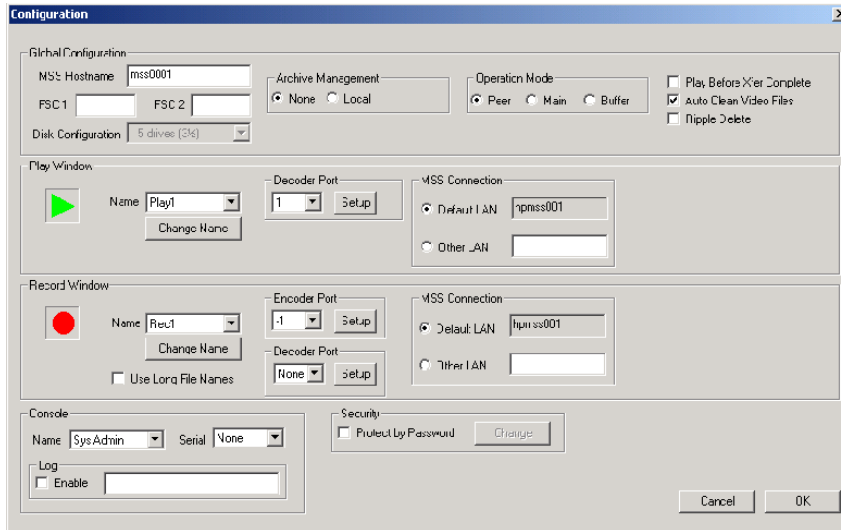
Global Configuration
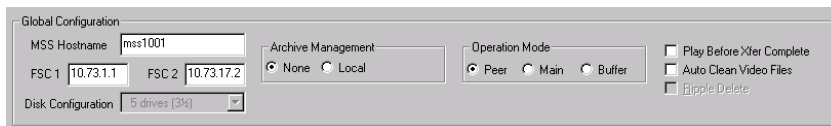
Global configuration sets up the communication link between the MSi, the server node and both FSCs.

- MSS Hostname is the <hostname> as specified in the hosts file of the MSS 8000 server node. If this field is not filled in properly, the MSi cannot properly communicate with the server node. Name syntax is as follows:

    mss **<YYXX>** where **<YY>** is the cluster number and **<XX>** is the Server Node

- FSC 1 and FSC 2 – set the FSC name or IP address in this section.
  The format is as follows:

    For FSC 1 – 10.XX.1.1 where **<XX>** equals Cluster Subnet

    For FSC 2 – 10.XX.17.2 where **<XX>** equals Cluster Subnet

Cluster Addressing

Initial Cluster Addresses					
Cluster 1	10.64.1	**Cluster 17**	10.81.1	**Cluster 33**	10.64.65
Cluster 2	10.65.1	**Cluster 18**	10.82.1	**Cluster 34**	10.65.65
Cluster 3	10.66.1	**Cluster 19**	10.83.1	**Cluster 35**	10.66.65
Cluster 4	10.67.1	**Cluster 20**	10.84.1	**Cluster 36**	10.67.65
Cluster 5	10.68.1	**Cluster 21**	10.85.1	**Cluster 37**	10.68.65
Cluster 6	10.69.1	**Cluster 22**	10.86.1	**Cluster 38**	10.69.65
Cluster 7	10.70.1	**Cluster 23**	10.87.1	**Cluster 39**	10.70.65
Cluster 8	10.71.1	**Cluster 24**	10.88.1	**Cluster 40**	10.71.65
Cluster 9	10.72.1	**Cluster 25**	10.89.1	**Cluster 41**	10.72.65
Cluster 10	10.73.1	**Cluster 26**	10.90.1	**Cluster 42**	10.73.65
Cluster 11	10.74.1	**Cluster 27**	10.91.1	**Cluster 43**	10.74.65
Cluster 12	10.75.1	**Cluster 28**	10.92.1	**Cluster 44**	10.75.65
Cluster 13	10.76.1	**Cluster 29**	10.93.1	**Cluster 45**	10.76.65
Cluster 14	10.77.1	**Cluster 30**	10.94.1	**Cluster 46**	10.77.65
Cluster 15	10.78.1	**Cluster 31**	10.95.1	**Cluster 47**	10.78.65
Cluster 16	10.79.1	**Cluster 32**	10.96.1	**Cluster 48**	10.79.65

- Archive Management – Set to None.
- Operation Mode – Set to Peer.
- Play Before Xfer Complete – When checked, files can be played back from disk as soon as enough material has been transferred to feed the playback buffers. When left unchecked, video files can only be played back when a file transfer is complete.
- Auto Clean Video Files – Leave unchecked.

Console

The Console section is not normally used with the Networked Storage System. Leave this set to None.

Console Configuration
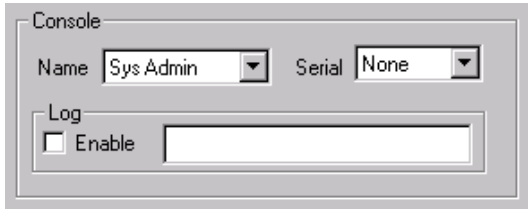
Play Window

The Play window pane contains the tools to configure decoder channels. When a channel is assigned, a decoder Play button for that channel is added as a Play button in the MSi window.

Play Window Configuration Area
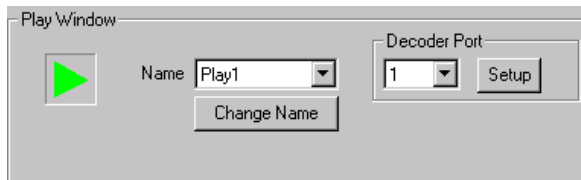
To configure decoder channels:

1. Select Play 1 as the Name.

2. Select 1 as the Decoder Port.

3. Click the Setup button, which opens the Decoder Configuration dialog box to configure Decoder channels:

Decoder Configuration Dialog Box
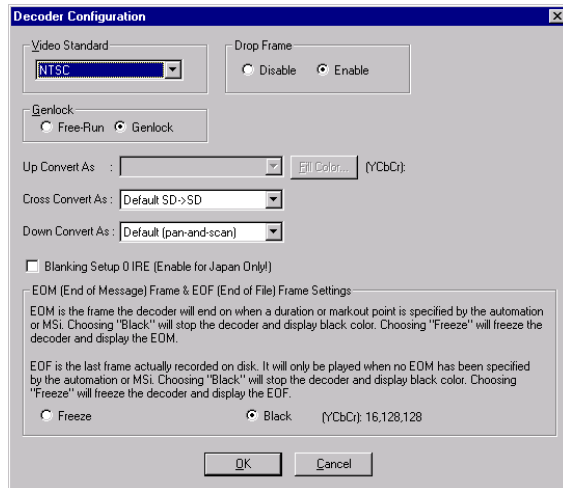
4. Set the following parameters:

   - Video Standard: Select NTSC or PAL.

   - Drop Frame: Select whether to enable or disable the drop frame time code.

   - Genlock: Select Genlock.

   - Display Mode (HD decoder board only): Sets up conversion display when converting Standard Definition (SD) signals to High Definition (HD) signals.

   - Blanking Setup: Leave unselected except for Japanese NTSC.

   - EOM: End of Message playback, select Black or Freeze. This determines how a file playback will end at the end of the playback message (time code out)

   - EOF: End of File playback, select Black or Freeze. This determines the output should a file play to the end of the recorded video.

5. Click OK to confirm your settings

You must repeat this procedure for each physical decoder channel.

Record Window

The Record Window pane allows you to configure the encoders installed in the server. Adjust settings in this pane to gain access from the MSi to each encoder and to specify encoder configurations.

To configure Record channels:

1. In the Record window panel, select Rec1 as the Name.

2. Select -1 as the Encoder Port.

3. To provide a preview channel to view record results, select 1 as the Decoder Port.

📄 *If automation also accesses the Preview port, use caution when assigning a decoder port as the Preview port. If a Preview port is associated with the encoder port on the MSi, using the MSi to record could potentially interrupt on-air operation through the Preview port.*

4. Click the Setup button associated with each Encoder port to display the Encoder Configuration dialog box.

Encoder Setup Configuration
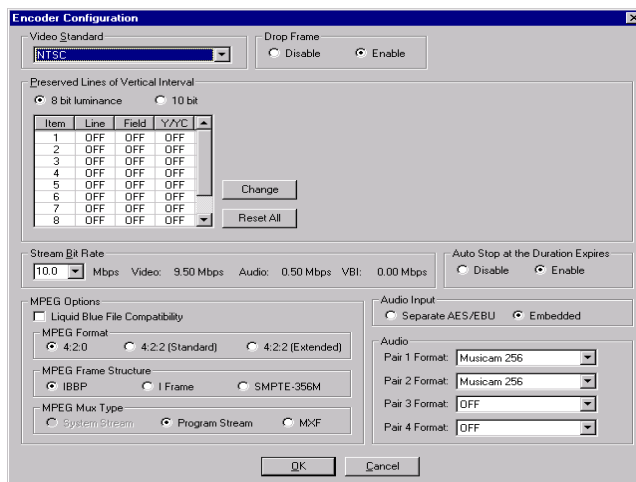
5. Set the following parameters:

•   Video Standard: NTSC or PAL.

📄 *This video standard must match the decoder standard. Although MSi supports multiple video standards selections, all Play and Record windows must be set to the same video standard (either PAL or NTSC). Mixed mode is not allowed and if used, the MSi returns an error message. Support of multiple video standards needs to be set on the server.*

•   Drop Frame: Choose the time code parameter, Enable or Disable.

•   Preserved Lines of Vertical Interval: Up to ten lines of Vertical Interval signals can be preserved before compression, using either 8-bit luminance or 10-bit YC. You may select one line to be preserved from each menu (for a total of ten). For NTSC choose any ten lines between line 10-21. For PAL choose any ten lines between 7-22 and/or 320-335.

•   Stream Bit Rate: Select the desired compression rate for the encoder channel. The rates range between 6 and 50 Mbps for MPEG 4:2:2. Dual decoder boards support a maximum rate of 50 Mbps.

•   Auto Stop at the Duration Expires: Specifies that recording will stop at the entered duration in the Record window. Select Enable or Disable.

•   Liquid Blue File Compatibility: Check this box to maintain file compatibility with the Liquid Blue editor.

•   MPEG Format: Select the desired MPEG recording format.

•   MPEG Frame Structure: Select the desired MPEG frame structure.

•   MPEG Mux Type: MSi automatically enables/disables Program Stream or System Stream selection, depending on the hardware. For HD, select Program Stream only. For SD, either MUX type may be selected. Select MXF to use Material eXchange Format.

•   Audio Input: Select the desired audio input method.

•   Audio: Select the desired Audio format for encoding. Choose settings for up to four Audio pairs (eight channels).

•   Click OK to verify the changes.

6. Repeat this process for each encoder channel.

MPEG Input Card Configuration

If you have an MPEG Input Card configured the process is similar as with record channels for encoders.

1. Select Menu > Configure. The configuration dialog appears.

2. In the Record window panel, select Rec<x> where x is the record channel with the MPEG input channel.

3. Select -<x> where x is the Encoder Port to assign.

4. Click the setup button for that channel. The MPEG Input dialog appears.

The system automatically detects the MPEG Input configuration and displays the right dialog.

Encoder Configuration MPEG In
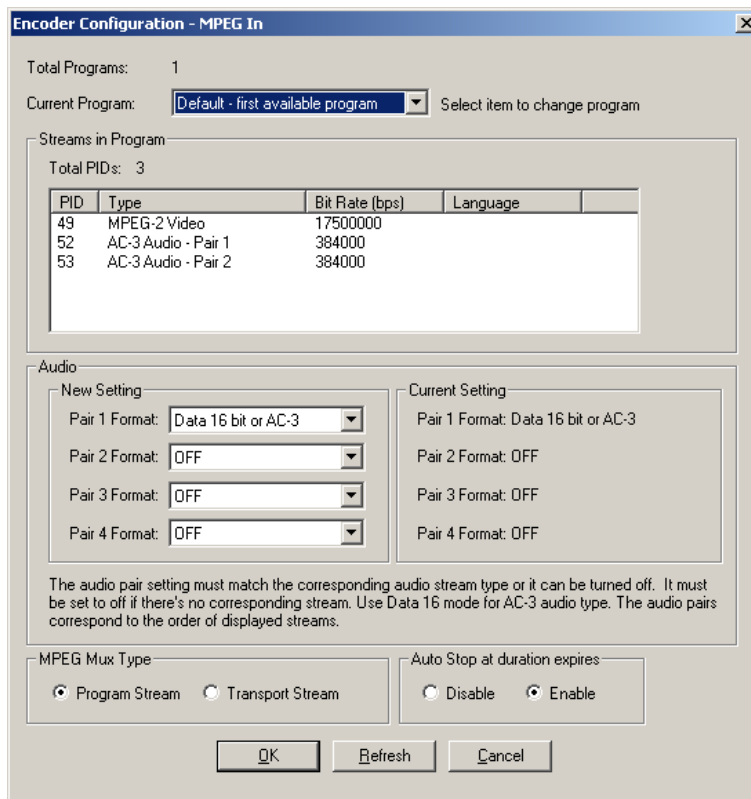
5. Choose the desired program stream. All available streams will be visible in the Stream List Box.

6. If audio is available, Choose audio pairs you wish to capture.

> 📖 *If audio format is Musicam, you must the correct format (either Musicam 256 or Musicam 384). The system is incapable of distinguishing which format is encoded. If you are unsure which Musicam format is used, consult with the program originator.*

7. Click OK.

Recording

To record video, click the Rec1 button on the right side of the MSi window. A Record window similar to the one shown in the following figure displays. There is a button for each encoder installed in the server. Choose the Rec (n) button for the encoder to be used for recording.

MSi Record Window with Port Unlocked
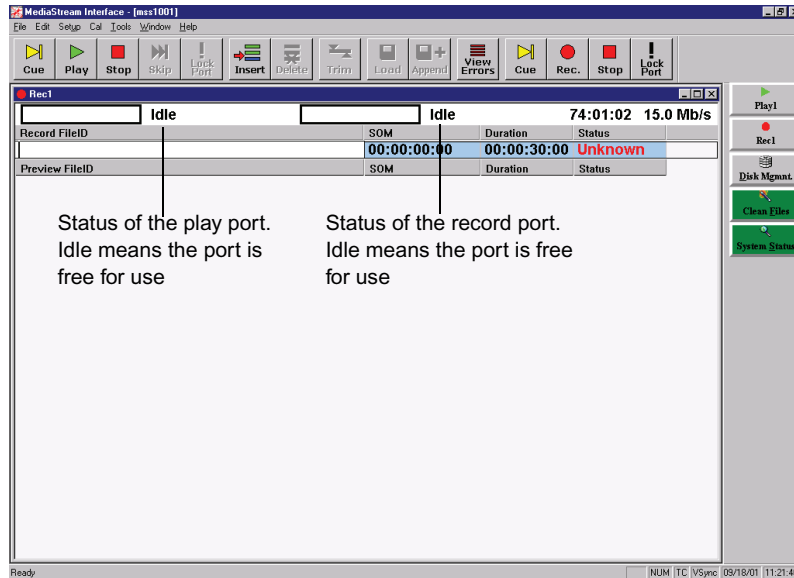
Record Port Status

When the Record window is open, an Idle status for the encoder record port may appear at the top right of the Record window. Idle means that the port is free for use. Generally it will be in use by automation.

Play Port Status

If the Record window is configured to play video (or preview it), then a second Port Status indicator should display at the top left of the Record window. This port status reflects the condition of the decoder Play port. The status should read Idle, assuming that the Play port is not already in use by a Play window or by automation.

Recording Video Files

Follow these steps to record video files (see the following figure):

1. Enter the Record File ID in the data entry cell under the field (see Step 1 in the following figure). The length of the file name can be up to 32 characters.

2. Change the Duration field to the desired time. Enter the duration in hours, minutes, seconds, and frames.

3. Click the Cue button in the toolbar, which causes the Record port to cue. After three seconds, the status should read Cued.

Recording Steps within MSi Window
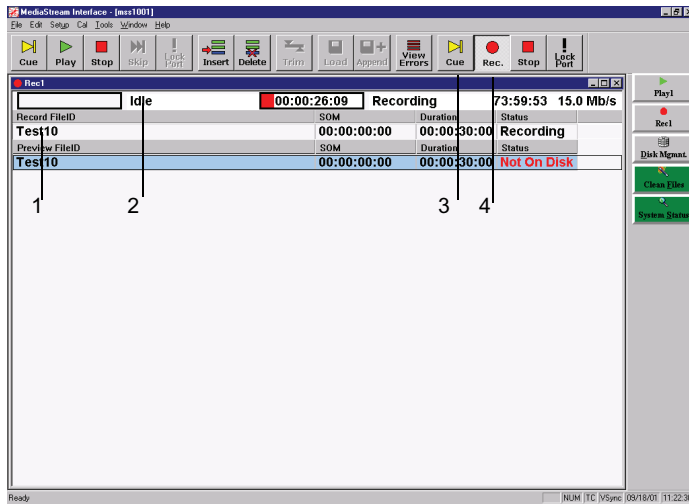
4. Select the Record button in the toolbar, which causes the Record port to record. The status should read Recording. After a few seconds of recording, the status for the recorded video file (clip) should change to On Disk.

Previewing the Video File

Preview means to play a video file, or clip, in a Record window. As soon as the status for a clip is On Disk, it can be played.

To preview the clip:

1. Select the clip (if there is more than one, otherwise go to Step 2).

2. Click the Cue button in the toolbar to cue the clip for playing.

3. Click the Play button to play the clip.

Previewing a Clip with MSi Window
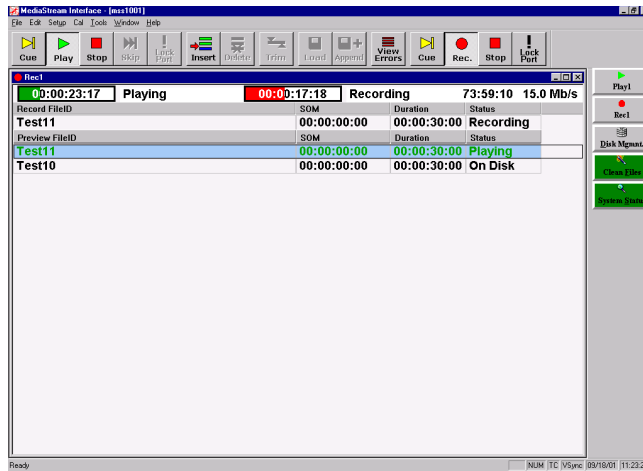
📖 *You can click Play without clicking Cue. The clip will cue automatically and then begin to play.*

Playing Clips

The Play window is similar to the Record window, but shows only the Play port's status.

MSi Play Window
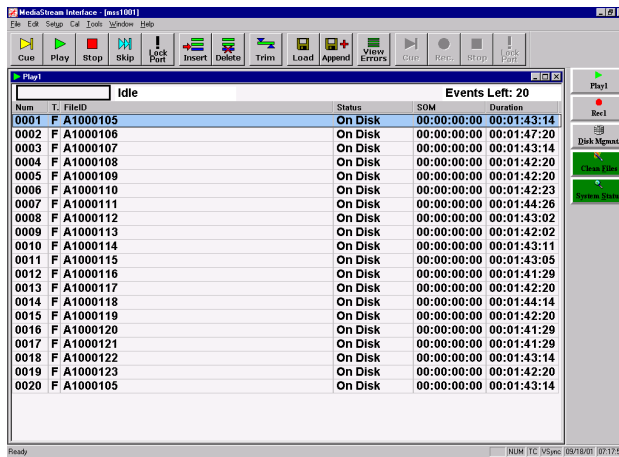
To play video files:

1. Click the Play1 button to open the Play window.

Play and Record buttons are located in the button column at the right side of the MSi window.

2. Click the Insert button in the toolbar to open the File ID Insert dialog box

File Insert Window for Playing Files
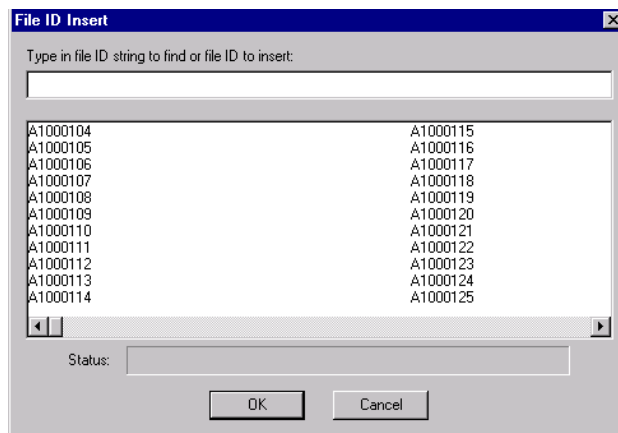
3. Enter the File ID in the text field if you know it, or select one or more files from the list.

📖 *To select multiple files, you can click and drag (that is, select the first file and hold down the mouse button while selecting additional files). You can also use the standard Windows multiple selection features: Press the Shift key while selecting to select contiguous files in the list, or press the Ctrl key while selecting separate files.*

4. Click OK to accept the selection. The file name(s) should now display in the Play window.

5. Click the Cue button in the toolbar.

6. Click the Play button in the toolbar to play the clip.

You can create a playlist, which is a text file from which you can select files for playing:

1. Select the files to be included from the list in the Play window.

2. From the MSi main menu, select File > Save As.

3. Enter a file name for the list, and click Save, which creates a playlist file.

Window for Creating and Saving Playlists
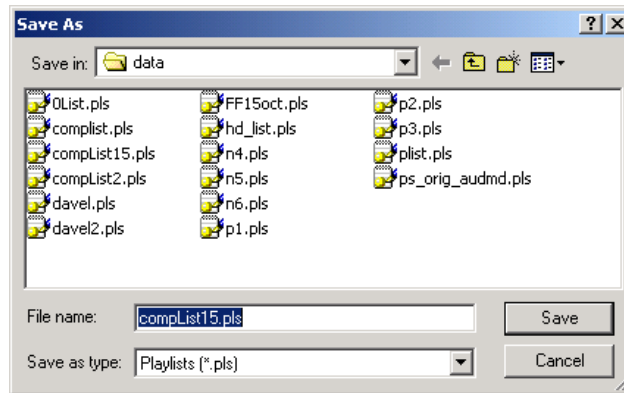
To load a playlist:

1. Click the Load button in the toolbar.

2. Select your playlist file from the Open dialog box, and click Open.

3. The playlist appears in your Play window.

Trimming

Trimming allows you to edit a video file, play it in slow motion, freeze a frame, or play it backwards. You use the Trimming window to set trimming parameters and view the results in a Play window.

MSi Trimming Window
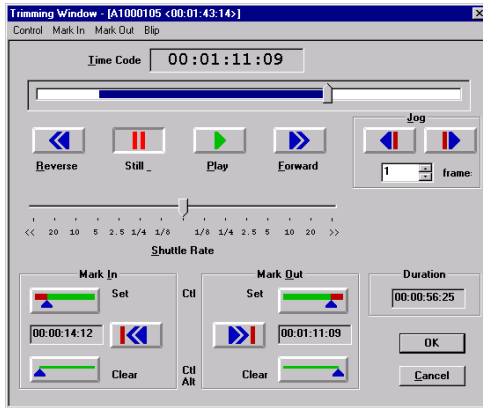
To apply the Trimming features to a clip:

1. Select a clip from the list in the Play window.

2. Click the Trim button in the MSi toolbar.

3. Click the Play button in the top half of the Trimming window to play the file normally.

📑   *The amount of time that the clip has played is shown in the Duration field (lower right of Trimming window).*

You can perform these tasks using the Trimming window:

• Play backwards and forwards

   You can set the direction of the clip using the Reverse and Forward buttons in the top half of the window. The Shuttle Rate setting determines the rate that the clip plays or rewinds. Drag the indicator to the left to decrease the rate, or to the right to increase it.

• Jump to another part of the video

   Use the scroll bar at the top of the window to jump to another part of the video by selecting the indicator and dragging it in either direction.

• Freeze a frame

   Click the Still button to freeze the file on the current frame.

• Advance/rewind a frame at a time

   The forward and backward Jog buttons cause the clip to advance or rewind one or more frames at a time. Set the frame increment in the Frame field.

• Set start and end points for viewing a segment of the click

The Mark In and Mark Out buttons add reference points to the clip, which are saved with the file in the playlist. If you delete the playlist or clear your Play window, the settings are lost. To edit a clip:

- Click Mark In to mark a start point for an edit.

- Click Mark Out to mark a finish point for an edit.

- Click OK to save your edits.

- Click Play in the Play window to play the edited clip.

The Disk Management Window

The Disk Management window provides utilities to manage video files. You can delete a file, rename it, or protect it from being deleted. The window lists all of the stored Clip IDs in alphabetical order.

To open the Disk Management window, click the Disk Management button to the right of the active MSi window. At the top of the window, you can see the number of clips stored on the server and the percentage of storage used.

The disk management utilities are located below the list:

• To delete a clip from the storage system, select it from the list, and click the Delete from Disk button.

• To rename a selected file, enter the new name/ID in the Rename as text box, and click Rename.

• To prevent a selected file from being deleted, select Delete Protected.

MSi Disk Management Window
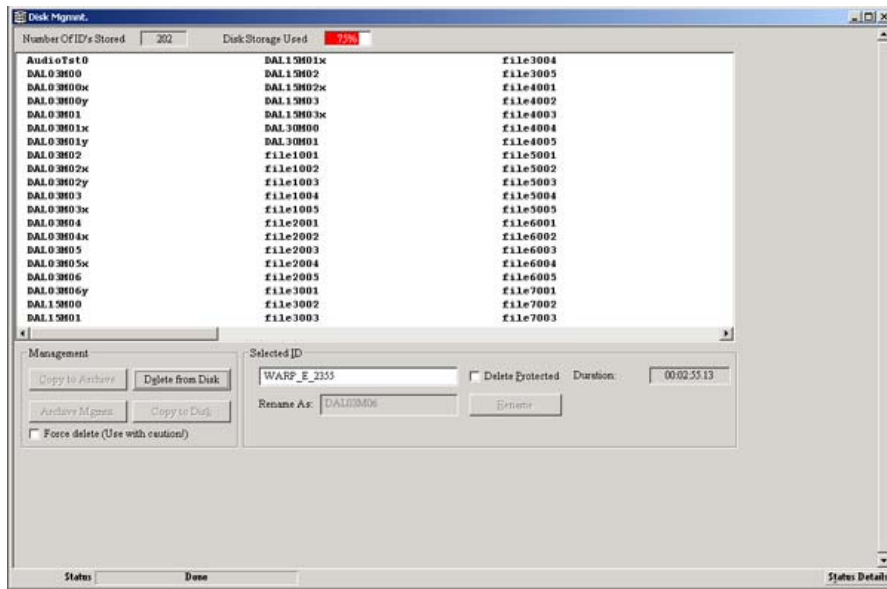
System Status Window

The System Status window allows you to monitor the status of the MSS 8000 and the Palladium Store 1000. Click the System Status button in the MSi button column to open this window.

MSi System Status Window
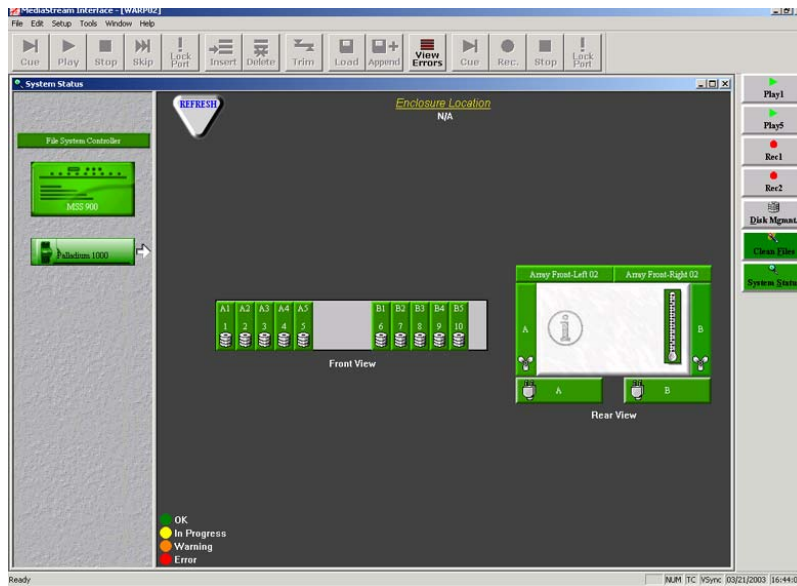
To monitor components of either the server or Palladium Store 1000, select its icon from the left side of window. Icons for each subcomponent that you can monitor display in the window. Double-clicking any subcomponent opens a dialog box that indicates its status.

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MSi System Status Dialog Boxes

Disks

Array

Power supplies

Fans

Chassis
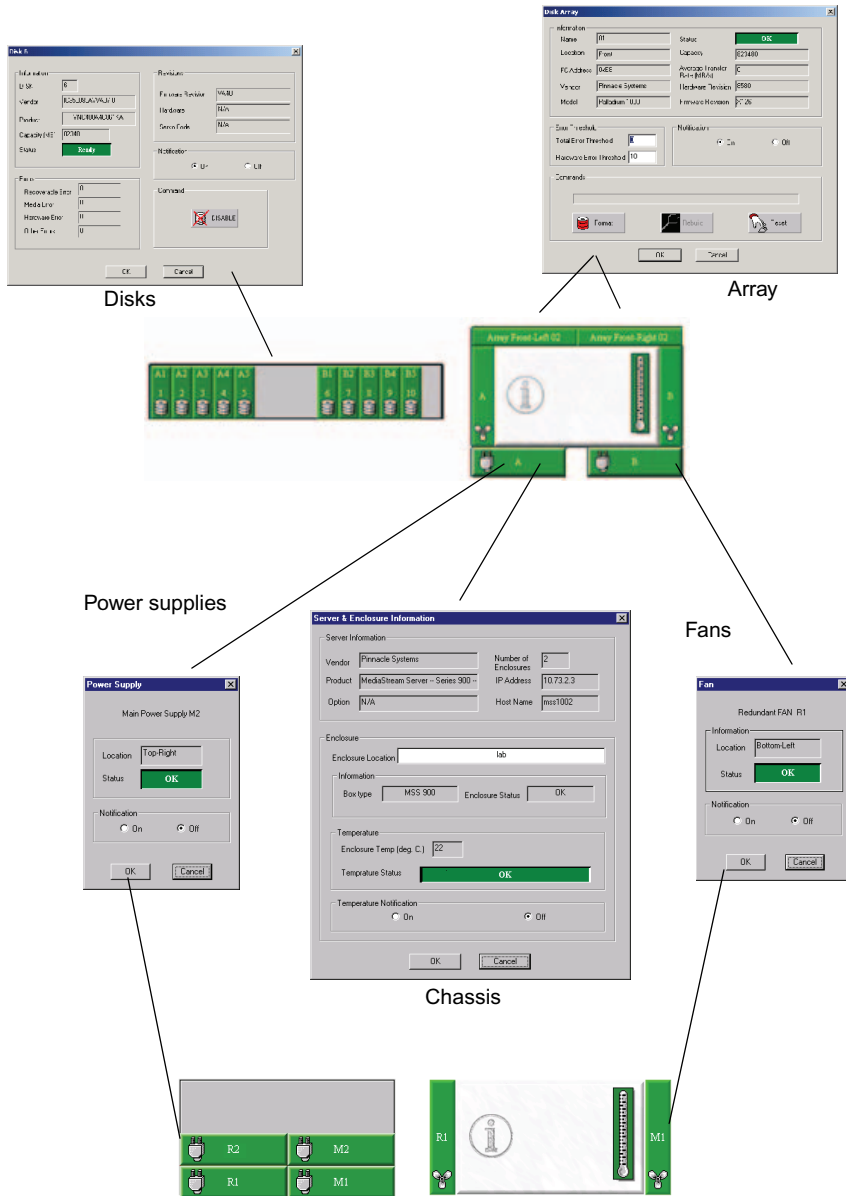
The following items are monitored:

- Power supplies for both the server and the array(s). If a supply fails, this button turns red.

- Fans (redundant) for both server/storage array. If a fan module fails, its button changes from green to red.

- Enclosure Information. (8000 chassis) Double-click the gray area of the Chassis icon in the window to display information about the enclosure. The temperature sensor turns to orange if a component begins to overheat.

- Disks. Double-click any disk to display disk status, error counter hardware firmware information and Disable button. For the Palladium Store 1000 chassis, Disable is not necessary and does not function. Do not attempt to disable a drive before changing disks. To replace a malfunctioning disk, simply remove it and replace it with a replacement disk.

- Disk Array. Click either button to reveal information about a given array controller. The Disk Array dialog box provides information about the controller. You also use this dialog box to rebuild arrays.

FSC Enclosure

Double-click the File System Controller icon in the left pane of the System Status window to reveal the File System Controller window (see the following figure) that provides information on the status and health of the system's two FSCs.

MSi FSC Status Dialog
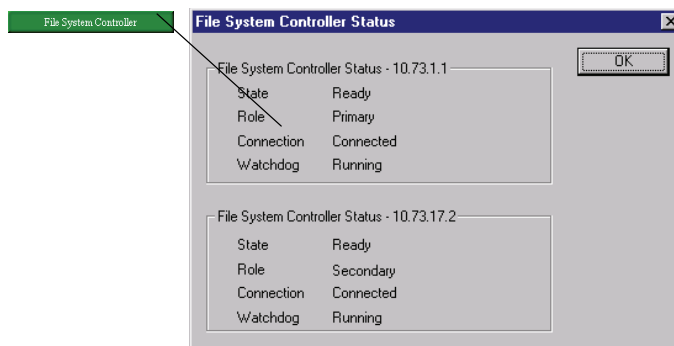
📖 *If the Drive Status for the FSC reads "Failed," run the Adaptec Storage Manager application on the FSC. If that succeeds in fixing the error, reboot the FSC to clear the "Failed" message.*

System Administration

Many tasks can be performed directly through the MSi. However, some configuration and maintenance must be performed through a command line interface. This is especially important when starting up and shutting down server nodes for maintenance. To perform these tasks, you need to communicate directly with the server node through the MSi PCs Telnet application. You will use also use Telnet to monitor and maintain the System's two FSCs.

Telnet from the Console Port

The Console Port is the preferred method of access to the server node for system maintenance, because the port can be active whether the server has completed boot-up or not. To launch a telnet session to the Console Port, right-click the server node icon in the MSi Control Panel and select Telnet from the menu. A telnet window displays.

MSi Control Panel
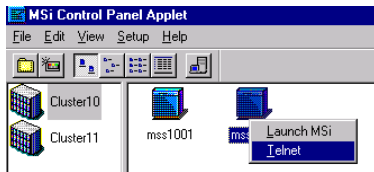
MSi Telnet Window
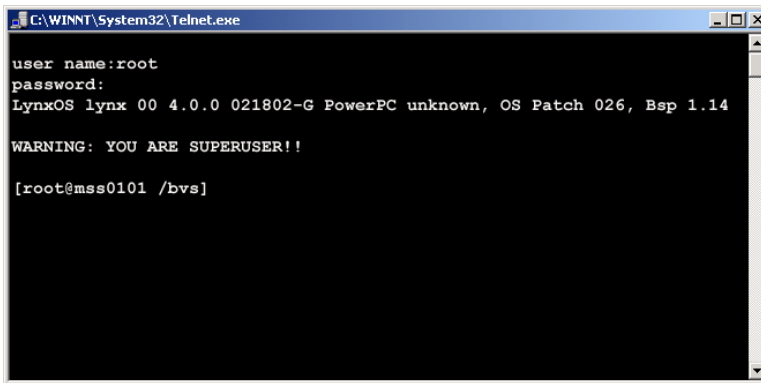
If the server node is running, a prompt similar to this should display: [root@0101]. If necessary, press the Enter key once or twice to display the prompt.

Opening Additional Telnet Sessions

The Console Port can only support one telnet session at a time. It is sometimes necessary to open more than one telnet session for some maintenance functions. If you need to open another telnet session on a server node, click Start > Run and enter:

```
telnet <Server Node Hostname>
```

A new telnet session opens (see the following figure). Enter **root** at the user name prompt and press Enter at the password prompt. The system returns the following:

```
LynxOS lynx00 4.0.0 021802-G PowerPC unknown, OS Patch 026, Bsp 1.14

  WARNING: YOU ARE SUPERUSER!!


 [root@mss0101 /bvs]
```

New Telnet Session Window
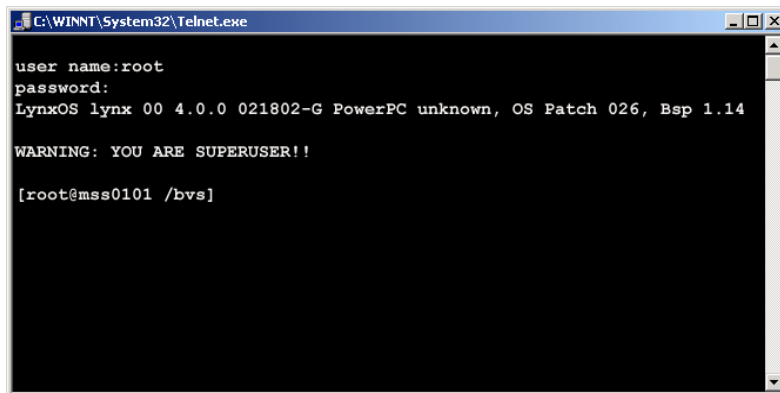
You may have multiple telnet sessions open.

Shutting Down and Restarting Individual Server Nodes

The MSS Networked Storage System can continue to operate normally while individual server nodes are shut down for servicing. During server node software upgrades, the node may be required to be restarted for the upgrade to be complete. Although power supplies and cooling fans may be replaced while the node is operating, the node must be powered down for servicing other components.

Server Shutdown

To safely shut down a server node:

1. Open a telnet session to the Console Port

2. If you have not done so already, login as root (password is `.root`).

3. Type `stopams -H` and press Enter

4. Wait for the words:

   `Halting (in tight loop) - OK to Hit Reset button`

5. Turn off the two power switches on the back of the machine.

Server Startup

To start a server node up after shutdown:

1. Power up the server node. Wait for a few seconds.

2. Open a Console Port telnet session. If you have one opened from your shutdown, you will need to reconnect it. From the MSi Control Panel, right-click the server node icon you wish to open and select Console from the menu.

3. The boot sequence should begin to appear. Wait several minutes for the entire boot sequence to complete.

4. When the message `HP:37N85A000` running appears, press Enter.

5. At the user prompt: enter `root`.

6. At the password prompt, type `.root` to complete the logon.

Server Reboot

To restart a server node after configuration change or software upgrade:

1. From a Console Port telnet session, type `stopams`.

2. Wait for the server node to reboot. The complete reboot may take five minutes or more depending on how many input output channels are configured.

3. When the message `HP:37N85A000 running` displays, press Enter.

4. At the user prompt, type `root`.

5. At the password prompt, type `.root` to complete the logon.

Telnet to File System Controller

Communication with and administration of the FSCs occurs from the MSi PC via Telnet. The FSCs operate on a Windows 2000 operating system.

To open a telnet session on an FSC:

1. Click Start > Run.

2. When the Run window opens, enter

   `telnet fscxx0y`

   where **<xx>** is the cluster number and **<y>** is the FSC 01 for primary and 02 for secondary, e.g., fsc0101 for primary FSC in cluster 1.

3. A telnet session opens.

Opening a Telnet Session

4. At the logon prompt, enter **Administrator**.

5. Press Enter at the password prompt:

Telnet Log onto FSC

A message displays saying that you are now logged on to the FSC.

Chapter 7 covers administration of the FSCs in more detail.

Powering Up a MSS Networked Storage System

In a normal operating environment, the MSS Networked Storage System remains powered up. Individual components may be powered down for servicing without interruption to system operations. Should the entire system need to be shut down for more extensive maintenance, the power on (and off) sequencing of components is important. The following startup procedure should be followed to bring the system back to an operational status:

1. Start the MSi PC.

2. Start the storage array(s).

3. If not already powered up, plug in the Fibre Channel switch power cords to power up the switches.

4. Start a server node.

5. If not already powered up, plug in the VLAN switches to power them up.

   - Start FCS 1.

   - Start FSC 2.

6. When both FSCs have booted successfully, run the `fsc_status` command on each. Wait for the script to run completely. The result of the script should resemble that shown here.

7. Start any remaining server nodes.

```
FSC Status

Fri 08/10/2001  8:39:02.11


               Local Host              Remote Host
   Hostname    FSC0101.pcle.com        fsc0102-22
   IP          127.0.0.1               10.64.22.2

APPLICATIONS
   Database    running                 running
   SanService  running                 running
   Watchdog    running                 running

DATABASE
   TCP Port    1315                    1325
   Role        PRIMARY                 SECONDARY
   Connection  CONNECTED               CONNECTED
   Remote DB   tcp 10.64.22.2 1325     tcp 10.64.22.1 1315
   Operations  1584610                 989983
   Date        08/10/2001              08/10/2001
   Time        08:33a                  08:33a
   Size        18,055,168              18,055,168

SANSERVICE
   Status      Ready                   Ready

WATCHDOG
   Status      ok                      ok

HSB STATUS REPORT 127.0.0.1

   This is a Hot Standby primary server.
   Connected to secondary 'tcp 10.64.22.2 1325'
   HotStandby log size 0 bytes
   Replicated 1584630 operations, 188775 transactions

HSB STATUS REPORT 10.64.22.2
   This is a Hot Standby secondary server.
   Replicated 989993 operations, 188775 transactions
```

Once the System is running, you will rarely have a need to restart it. Most service procedures are performed on running components or they require individual components to be shut down.

Controlled System Shudown

Use the following procedure to shut down the entire system from the MSi PC.

1. Telnet to each server node.

2. Type the command `stopams -H` to stop the server nodes. Wait for the *LynxOS is down* message to display before turning off the power on each server node.

3. Telnet to each FSC and enter the command `fsc_stop` for each. Follow the on-screen instructions.

You should stop the FSC 2 first and FSC 1 next. When you restart, start FSC 1 first followed by FSC 2. This sequence ensures that FSC 1 remains the Primary FSC.

4. Wait for the database to update. Then quickly depress the power button on the front panel of each FSC. This will execute a graceful shutdown of each FSC.

5. Turn off the other system components.

The last FSC you shut down must be the first FSC you restart.

The MSi application may be closed at any time the system is idle using the normal Windows 2000 application exit function (click the "x" located at the far right end of the application title bar). You can power down the MSi PC at any time without adverse effect on the server node's external applications.

Before you shut down the MSi application, be sure you are not playing or recording using the MSi Play or Record windows.

Chapter 7
Introduction to System Administration

This chapter explores some concepts and tools you will need to use when you are administering the MSS Networked Storage System. Many administration tasks are performed in several different command-line interfaces. The MSS 8000 server nodes operate in an LynxOS environment that is very similar to UNIX. The FSCs are administered through telnet sessions using a command-line interface. This chapter covers these topics:

- Useful UNIX commands
- Introduction to the *vi* editor
- Introduction to FSC administration
- Introduction to server node configuration

Logging On to the Server

When prompted to enter your username, type **root** and press Enter. The password is "**.root**" (no quotes). The server responds as follows:

```
user name:root
LynxOS lynx00 4.0.0 021802-G PowerPC unknown, OS Patch 026, Bsp 1.14
WARNING: YOU ARE SUPERUSER!!

[root@0101 /bvs]
```

By logging on as **root**, you have the privileges required for server administration.

UNIX Commands

UNIX commands are abbreviations of actions; for example:

- **ls**

  lists the contents of a directory.

- **rm**

  removes a file.

- **cd**

  changes your directory path in the file hierarchy.

📑 *UNIX is case sensitive. Your entries on a command line must be exact, including case and punctuation.*

Command Syntax

UNIX command syntax consists of the commands (similar to verbs) and arguments (similar to direct objects) that modify commands. You can add flags to further modify a command.

A command by itself describes an action. For example:

- **pwd** displays the current directory location.
- **date** displays the current date and time.

An argument added to the command redirects the command's action. For example, **cd /bvs** changes your current directory to the directory bvs. Flags, which begin with a minus (-) sign, modify the command. For example, when you add the -l flag to the ls (list) command (ls -l) the output is a detailed list of a file directory (either the current or specified directory).

You can combine commands, arguments, and flags according to UNIX syntax. For example. entering **ls -l bvs*** means that you want a detailed list of all the files in the directory that begin with bvs. The asterisk **(*)** is used as a wildcard that represents any subsequent characters. The command line returns all files in the directory that start with the characters *bvs*.

Basic UNIX Commands

Daily operation of the server requires a basic knowledge of UNIX. The following table lists the commands most useful for normal server operation. A more detailed description of each command follows

Basic UNIX Commands

UNIX Command	Action
cd	Change directory
pwd – "Where am I?"	Returns current working directory location
ls	List files
mkdir	Make directory
rmdir	Remove directory
cp	Copy files
mv	Move files; use to move or rename files
rm	Remove file; a *dangerous* command because there is no undo
more	Read the contents of a file

Change Directories

Use the cd command to move between directories. UNIX directories begin in the root directory, which is specified by a forward slash (/). Entering cd/ moves you to the root directory. Entering **cd /<dir>/<dir>** allows you to move within directories several layers deep.

For example, entering **cd /bvs** moves you to the /bvs directory.

Two important server directories are /bvs and /etc. The /bvs directory is the Broadcast Video Server directory, which contains configuration information, including the bvsrc file—the primary server configuration document. The /etc directory contains the hosts file.

Where Am I? Command

Entering the pwd command returns the pathname of your current directory. When logged onto a server, this command is unnecessary because the System has been set up to return the active directory at all times. This command is useful when you run FTP (File Transfer Protocol) from a command-line interface.

List Command

The ls command allows you to view the contents of a directory. To list the contents of a directory, use the cd command to move to the directory (**cd /<dir>**), and then enter ls on the following command line.

Examples of ls command syntax:

- `ls -l`

  provides a detailed list of the contents of the selected directory.

- `ls -l *hosts*`

  provides a detailed list of all files in the directory that contain hosts.

Make a Directory

The mkdir command allows you to create a new directory in which to store files. The syntax is `mkdir <dir name>`

Remove a Directory

The rmdir command allows you to remove a directory. The syntax is `rmdir <dir name>`

Only empty directories can be removed with rmdir.

Copy Command

The cp command allows you to make backup copies of files or create copies of files in other directories. The syntax is `cp <filename> <new filename>` or `cp <filename><newdirectory>`. For example:

- `cp bvsrc bvsrc.b`k

  creates a copy of the file bvsrc named bvsrc.bk and stores it within the same directory

- `cp bvsrc /newdir`

  creates a copy of the file bvsrc and places it in /newdir

- `cp *hosts* /newdi`r

  copies all files that contain *hosts* in their names to /newdir

- `cp hosts fchost /newdir`

  copies the two files to /newdir

To copy multiple files to a new location, either use the wildcard (*), or list each file individually.

Move File

The mv command allows you to move files to new directories and to rename files within a directory. The syntax is mv `<filename> <newdirectory>` or mv `<filename> <newname>`. For example:

- `mv bvsrc.bk /etc`

   moves the file bvsrc.bk to the /etc directory

- `mv bvsrc.bk bvsrc.new`

   renames the file bvsrc.bk to bvsrc.new. The file named bvsrc.bk no longer exists.

You can move multiple files to a new directory.

Remove Files

The rm command allows you to remove files. A removed file is permanently deleted and cannot be restored.

The syntax is `rm <filename>`

For example:

   `rm bvsrc.bak` removes the file bvsrc.bak.

As a precaution, add the `-i` (interactive) flag when you issue the remove command. Entering
`rm bvsrc.bak -i` asks you to confirm file deletion:

   `rm: remove bvsrc.bak?`

Press y to delete the file, or n to cancel the command.

More Command

Use the more command to view the contents of a file. Entering `more <filename>` displays the contents of the file, one screen at a time. Press the space bar to display the next screen.

To quit the file, type `q.`

The *vi* Editor

The *vi* editor is a text editor for UNIX systems. To create a new file and open the editor, type `vi <newfilename>`. When the editor starts, a cursor for data entry appears at the top of the screen and tilde (~) characters appear down the side of the screen.

Command Mode vs. Text Entry Mode

When you edit with *vi*, you work in one of two modes—command or text entry. To toggle between modes, press the Esc key. In command mode, you press a key such as *i*, which is the command to insert text after the cursor. To insert text, press Esc to enter text entry mode. Then type the characters you want to insert. You remain in text entry mode until you press Esc to return to command mode from which you can issue another command, such as *x*, which deletes one character. See Table for a description of *vi* commands.

Saving a File and Quitting

To save and quit your file, enter the command `:wq!` which combines the write (w) and quit (q) commands. The explanation point (!) means you really want to issue this command. To quit without saving, type `q!` which means quit without saving my work.

Quick Reference

Function	Key	Action
Add text	a	Append or add text after cursor
Insert text	i	Insert text after cursor position.
Navigation	h	Moves cursor left one space
	l	Moves cursor right one space
	j	Moves cursor down one line
	k	Moves cursor up one line
	0	Moves to beginning of line
	$	Moves to end of line
	G	Moves to last line
	<n>G	Moves to nth line
	<Ctrl> b	Moves back 1 page
	<Ctrl> f	Moves forward 1 page
Deleting	x	Delete 1 character
	d	Delete through the end of the line
	dw	Delete word
	dd	Delete line

Quick Reference (Continued)

Function	Key	Action
Replacing	r	Replace 1 character
	R	Replace until you press Esc
	cw	Change word
Undo	u	Undo last change to file
	U	Undo current line if changed
Open new line	o	Open new line below cursor
	O	open new line above cursor
Searching	/<pattern>	Search for specified pattern
	n	Press n to look for next instance
Quitting	<esc> :wq!	Save and quit (write and quit)
	<esc> :q!	Quit without saving

Introduction to FSC Administration

When you boot up an FSC, it starts an auto logon process that allows system boot without requiring a user logon.

fsc_start

The fsc_start script is used to startup the individual components of the FSC and makes sure that all programs have been started properly.

Three critical module that must start successfully are:

- Database – the data structure that actually manages the video file system
- SanService – the FSC operating module which manages network traffic
- Watchdog – an application designed to constantly monitor the health of critical FSC components.

Running fsc_start

Normally, the FSCs starts automatically. When you enter the command fsc_start, a successful script will look something like this:

```
INFO      Check for old Database process
INFO      Check for old SanService process
INFO      Check for old Watchdog process
INFO      Starting Elogger

INFO      Database EXE present
INFO      Elogger EXE present
INFO      SanService EXE present
INFO      Watchdog EXE present
INFO      All EXEs present
INFO      Database file present
INFO      Start Database
INFO      Check Database
SUCCESS   Database running
INFO      Number of DiskProxies defined in fsc.ini file = 2
INFO      Found DiskProxy mss1001
INFO      Start SanService - may take up to 20 seconds
INFO      Checking SanService status.
INFO      FSC returned Ready
SUCCESS   SanService running
INFO      Start SanWatchdog
SUCCESS   SanWatchdog running
INFO      Start log trail
SUCCESS   Server started successfully
INFO      fsc_start script finished
[C:/fsc]
```

If the system detects that one or more applications are running, you are alerted as follows:

```
INFO      Check for old Database process
WARNING   Database already running
INFO      Check for old SanService process
WARNING   SanService already running
INFO      Check for old Watchdog process
WARNING   SanWatchdog is already running

INFO      fsc_start detected old instances of application processes running.
INFO      The script can only be executed when these are shut down, which may
INFO      take you off air.
INFO      Are you sure [y/n]? n
```

If you are unsure of the state of the system, press n and then press Enter. The script will exit without affecting current operation. Run fsc_status (see below) to determine the status of both FSCs before proceeding.

If you are sure you are able to shut down the FSC, press y and then press Enter. The script will stop currently running applications and execute the start script normally.

fsc_status

The FSC status utility detects and reports the status of both FSCs in the network. This utility should be run before performing any maintenance on FSCs. Because the system is designed to be serviced while on-air, it is critical that both FSCs are in good working condition when you are performing routine maintenance.

If you try to shut down an FSC while the other unit is in a Shutdown or Not Ready state, you will bring the entire system off-air.

When you run fsc_status, a healthy system with two operational FSCs responds as follows:

```
FSC Status
Tue 10/02/2001 15:07:21.76


               Local Host              Remote Host
   Hostname    FSC1001.pcle.com        fsc1002-22
   IP          127.0.0.1               10.73.22.2

APPLICATIONS
   Database    running                 running
   SanService  running                 running
   Watchdog    running                 running

DATABASE
   TCP Port    1315                    1325
   Role        PRIMARY                 SECONDARY
   Connection  CONNECTED               CONNECTED
   Remote DB   tcp 10.73.22.2 1325     tcp 10.73.22.1 1315
   Operations  3271                    9534
   Date        10/02/2001              10/02/2001
   Time        02:52p                  02:54p
   Size        39,354,368              39,354,368

SANSERVICE
Connection    CONNECTED               CONNECTED
   Remote DB   tcp 10.73.22.2 1325     tcp 10.73.22.1 1315
   Operations  3271                    9534
   Date        10/02/2001              10/02/2001
   Time        02:52p                  02:54p
   Size        39,354,368              39,354,368

SANSERVICE
   Status      Ready                   Ready

WATCHDOG
   Status      ok                      ok
HSB STATUS REPORT 127.0.0.1
   This is a Hot Standby primary server.
   Replicated 3271 operations, 481 transactions

HSB STATUS REPORT 10.73.22.2
   This is a Hot Standby secondary server.
   Connected to primary 'tcp 10.73.22.1 1315'
   HotStandby log size 0 bytes
   Replicated 9534 operations, 936 transactions
```

FSC Status Report Details

Hostname

Local Host is the FSC to which you made the telnet connection. *Remote Host* is the other FSC. If you had connected to fsc0102 and run this command, fsc0102 would be listed as the Local Host.

IP Address

The network address of each FSC is an IP address. These addresses are set at the factory. Do not attempt to change them.

Applications

Status of the three operating applications Database, SanService and Watchdog are checked. If the FSC is operating normally, all three should be listed as *running*.

Database

Each FSC maintains a separate database of all clips on the RAID storage system. The fsc_status utility can be used to determine if the two databases are in sync. When run from either FSC, the output will contain a column for the local machine and another for the remote machine.

Make a note of any deviations for diagnostic purposes.

- **Role**

  One FSC should show the role "PRIMARY" while the other should show "SECONDARY". The other FSC will only become primary if the first one fails.

- **Connection**

  Both FSCs should show "CONNECTED", meaning they are connected to the database. If one is not, there may be a network problem, or the Database may be *out of sync*.

- **Remote DB**

  This refers to the copy of the database that resides on each FSC. Each FSC should show the TCP port number and IP address of the other.

- **Size**

  Two synchronized databases will not always be the same size. The Solid RDBMS system replicates data on the secondary database by issuing Data Base Transactions. It does not make a binary copy of the Primary database. Database size will become different over time depending upon usage, load and file system characteristics of the two systems.

SanService

SanService handles network management. Both FSCs should show "Ready". If you see "Not Ready", "No Response", or "Connection Broken", make a note for diagnostic purposes and refer to "Troubleshooting Database Problems" on page 327 for possible corrective action.

Watchdog

Watchdog monitors the FSC operation. Both FSCs should show OK. If you see an Error, make a note for diagnostic purposes.

If the FSC Status report indicates a problem with the other FSC, telnet to that FSC and run a report. The results of the two reports will narrow your search for the problem.

fsc_stop

The FSC Stop script allows an FSC to be shutdown in a safe manner that ensures database integrity. Always run fsc_stop before shutting down the FSC PC.

⚡ **Make sure that the other FSC's status is Ready, OK before shutting down a given FSC. Otherwise, you may take the system off-air.**

```
SANSERVICE
   Status        Ready                    Ready
  Role          SECONDARY                PRIMARY
   Connection   CONNECTED                CONNECTED
   Remote DB    tcp 10.73.22.2 1325      tcp 10.73.22.1 1315
   Operations   133852                   138163
   Date         10/02/2001               10/02/2001
   Time         09:37a                   09:37a
   Size         39,354,368               39,354,368

SANSERVICE
   Status        Ready                    Ready

WATCHDOG
   Status        ok                       ok
```

To safely stop an FSC, type **fsc_stop**. The following warning displays:

```
INFO      WARNING!
INFO      You are about to stop the FSC.
INFO      Use 'fsc_status' to ensure that the other FSC is running proper
INFO      Having no running FSC will take you off air!
INFO      Are you sure to continue (y/n)? INFO      Stop Server
```

Press y, then press Enter. The following output indicates that the application has stopped:

```
INFO      Stop SanService
INFO      Checking remote database status, this may take few seconds..
INFO      Waiting for remote side to switch to PRIMARY
INFO      Creating a checkpoint before database shutdown
INFO      Shutdown Database....
INFO      Stop Watchdog
INFO      Stop Elogger
INFO      Script finished.
```

Introduction to Server Node Configuration

Server node administration via Telnet is introduced in *Chapter 6.* Most configurations and monitoring of individual server nodes are performed through telnet. administration and upgrades of the server node requiring reboot should be handled through a console port login (see "Telnet from the Console Port" on page 136). For many administration tasks, more than one telnet session may be advantageous. Multiple LAN telnet sessions for one or more server nodes may be opened at the same time on the MSi PC. For information on opening LAN telnet sessions, see "Opening Additional Telnet Sessions" on page 137.

/bvs Directory

When you log on to the server node, it should open with the prompt, [root@0101 /bvs]. This tells you that the node opens at the /bvs directory, a subdirectory of / (root directory). /bvs contains the bvsrc file (broadcast video server run command). This is the primary configuration file for the server node. The /bvs directory also contains many important configuration files as well as the /bvs/bin directory, which holds many executable files used for operation and maintenance.

/etc Directory

Another important directory is the /etc directory which holds the hosts file, critical to LAN communication. This file must be configured for each new server node added in the system.

Configuration Checks

Configuration files are pre-set at factory. Check these files if you have trouble starting the server node on bootup, or after you have changed configuration settings or performed upgrades or installed software that may have changed initial configuration.

Startup Server Node

1. Turn on the server node.

2. On the MSi PC, open a telnet session. Go to Start > Run.

3. Enter **telnet con0101** (for Cluster 1). The Telnet window opens.

4. Watch the booting sequence over the telnet session. When you see the following prompt:

    Press the ESC key. The prompt should return [root@01 /bvs].

```
Waiting 00:40 to start the MSS storage controller:
- Press <return> to start the MSS Server immediately.
- Press ESCAPE to end the timeout and bypass the MSS server startup.
{ 0:40} Waiting to start MSS Server.  (<Enter>=StartNow or <ESC>=DoNotSt
```

📄   *After you log on, the prompt will always return as [root@XX /bvs] with XX representing the server node ID number. A [root@01 /bvs] prompt represents MSS server node 1.*

Verify Hosts File

1. Change the directory to /etc (at the prompt type **cd /etc**).

    The prompt will return [root@01 /etc].

2. Enter **vi hosts**. The hosts file will open in the *vi* editor (see the following figure). In the example below, the hosts file for a Server Node 1 configured in Cluster 1 is shown. Your hosts file should look something like this. If it looks substantially different, the server node's hosts file has not been set up (see step 3). The hosts file is rather large, and this sample only represents part of the first screen display. The important values to check are all on the first page. They are:

    Cluster Number – should match the designated cluster number of the system. Cluster 1 is the most common.

    Cluster LAN Address – will be 10.xx.yy.3 – where **<xx>** equals cluster subnet and **<yy>** equals server node number.

    Server Node Hostnames – will be of the value mssxxyy where **<xx>** equals cluster number and **<yy>** equals server node.

Server Node Hosts File

```
# $Header: /warp7/san/cfg_files/hosts01 1.4 2001/08/09 20:45:25 dlow Exp $
#
# Cluster 1                          Cluster number
#
# MSS Nodes (Cluster 1)
#----------    ---------    -----------------     ----------------------------
# Lan Addr      HostName    Aliases               #Comments
#----------    ---------    -----------------     ----------------------------
10.64.1.3      mss0101                            #Cluster01
10.64.2.3      mss0102                            #Cluster01
10.64.3.3      mss0103                            #Cluster01
10.64.4.3      mss0104           Server node      #Cluster01
                                 hostnames
10.64.5.3      mss0105                            #Cluster01
10.64.6.3      mss0106                            #Cluster01
10.64.7.3      mss0107                            #Cluster01
10.64.8.3      mss0108           Cluster LAN      #Cluster01
                                 address
```

3. Verify the cluster number for the hosts file. The /etc directory has 16 prebuilt hosts files. If the cluster number of the hosts file you opened under vi hosts is incorrect, you will need to copy one of the prebuilt files to the name hosts. At the prompt, enter:

   [root@01 /etc] cp hostsxx hosts
   where **xx** is cluster number.

   The prebuilt hosts file will overwrite the existing file.

📄 *If the cluster ID number is correct, both the LAN address and host name settings for the file will also be correct.*

Verify Configuration of Site Files

From the /etc directory, enter this command line: **more sitefiles.cfg**

The following values should be set.

```
[root@1002 /etc] more sitefiles.cfg
ENABLE_NFS:true
SAMBA_SERVER:false
NUMLOGS:250
NTP_SERVER:fsc1001-2
HOSTNAME:mss1002
NETMASK:255.255.255.0
DEFROUTE:10.73.2.32
```

If these values are not present, call Avid MediaStream Support.

📖 *DEFROUTE will change depending on the server node and cluster ID in question.*
HOSTNAME is the name of the server represented. The NUMLOGS setting may or may not
be present and may vary. The NUMLOGS setting determines the number of logs saved on the
server.

Verify bvsrc File

Change directories to **/bvs** and in *vi* open the bvsrc file (an example follows).

BVSRC File Details

```
FILEID:         BVSCFGFILE              # HP Video Broadcast Server
                               SAN Model
REV:            2.4            Number    #   cfg file fmt rev num

MODEL:          "HP:37T85A000"          # Generic model number for all configs
FCHOST_NAME:    /etc/fchosts            # DO NOT change this line.

#              VideoServer
#              Cpu Name    Local Host
BVS_CPU:        mss1001     Name.

#BVS_CPU:       hpmss000                # Uncomment if this is a peer cpu
#BVS_CPU:       hpmss001                # Uncomment if this is a peer cpu
#BVS_CPU:       hpmss002                # Uncomment if this is a peer cpu
# Uncomment the following line only if Louth RS422 Copy command is used
#BVS_CPU:       aardvark
```

```
           FILEID:          BVSCFGFILE              # HP Video Broadcast Server

           #          BVScpu   Encoder   Encoder        Video Encoder   Hardware    Video
           #  Type     name   HW Addr  Model+Rev       Firmware File   Cfg File   P.Num
Configured VIDEO_IN: mss1001    0    "422 encoder"    "enc_code"    "enc_fpga_m422"   -1
Encoders.  VIDEO_IN: mss1001    1    "422 encoder"    "enc_code"    "enc_fpga_m422"   -2
           #VIDEO_IN: mss1001   2    "Unassigned"     "enc_code"    "enc_fpga_m422"   -3
           #VIDEO_IN: mss1001   3    "Unassigned"     "enc_code"    "enc_fpga_m422"   -4
           #          BVScpu   Decoder   Decoder        Video Decoder   Hardware    Video
           #  Type     name   HW Addr  Model+Rev       Firmware File   Cfg File   P.Num
Configured VIDEO_OUT: mss1001   0    "422 decoder"    "dec_code"    "dec_fpga_emb"    1
Decoders.  VIDEO_OUT: mss1001   1    "422 decoder"    "dec_code"    "dec_fpga_emb"    2
           VIDEO_OUT: mss1001   2    "Unassigned"     "dec_code"    "dec_fpga_emb"    3
           #VIDEO_OUT: mss1001  3    "Unassigned"     "dec_code"    "dec_fpga_emb"    4

           #  Type   BVScpu name   HW Addr   HW PLD File    Utility BoardNum
           #COMP2D1: mss1001       0       "comp2D1_pld"    1
           #          Host        SCSI Device      Driver    Library   Library

           #          BvsCpu        File Name      RevName   ArchCtlr  RevName
           #ARCHIVE:  mss1001   /etc/aamadm_config  "SGT:2.0"  stkacs0    "x01"
SAN
Configuration #       Video File System Environment file.
           VFS_ENV:       "cfg_files/vfs_san.env"

           #       Shared Video File System Configuration Parameters
           SAN_CONNECT: "local"         # VidFileSys Connection method
           SAN_SVR1:    "fsc1001-1"      # First VidFileSys hostname.
           SAN_SVR2:    "fsc1002-1"      # Second VidFileSys hostname.

           #           Port     Num       BVS
           #           Number  Connects   CPU Name
           LANPORT:     6000     42       mss1001

           #           Baud    NumberOf   Parity     Parity    NumberOf
           #           Rate    DataBits   (1=Enab)   Even/Odd  StopBits
           COMPORT_CFG: 38400    8          1          O          2
```

📖 *In the complete bvsrc file there are listings for all possible encoders and decoders (16 entries each for encoders and decoders). This file has been abridged to fit on the page.*

Check for the following entries (see the previous figure).

- Model: HP:37N85A000.

- BVSCPU: First entry should read mssxxyy – where <xx> equals Cluster Number and <yy> equals Server Node Number for the local file.

- VIDEO_IN: Remove the comment (#) sign that precedes the entry for each configured encoder installed in the System. Count the installed encoders on the server node and compare this number to uncommented entries in the file.

- VIDEO_OUT: Remove the comment sign that precedes the entry for each configured decoder installed in the System. Count the installed decoders on the server node and compare this number to uncommented entries in the file.

📖 *Dual decoders contain two decoders for each card. In the case of dual decoder boards, two entries need to be uncommented for each installed card. In the case of a fully configured system, only 12 channels are supported. You may encounter a case where one of the dual decoder cards is only using one available channel and the other is left uncommented. This is the correct setting.*

- SAN configuration settings: The following settings must be correct for the node to operate properly in for a SAN (Storage Area Network) configuration:

```
VFS_ENV:        "cfg_files/vfs_san.env"

#         Shared Video File System Configuration Parameters
SAN_CONNECT: "local"              # VidFileSys Connection method
SAN_SVR1:    "fsc1001-1"          # First VidFileSys hostname.
SAN_SVR2:    "fsc1002-1"          # Second VidFileSys hostname.
```

If these entries are not correct, the bvsrc file must be edited to include them.

Running edit_bvsrc

If any entries are incorrect, you can edit them in *vi*. In the case of adding or removing encoder or decoder cards, this is the easiest way to update the file. Add a comment (#) sign for each card removed from a server node, or remove the sign for each card added. If extensive edits are required and you wish to avoid making mistakes in the file entries the, safest way to correct the file is to run edit_bvsrc.

To run edit_bvsrc:

1. If you have not already done so, change directories to /bvs. The command prompt for this directory is [root@0101 /bvs].

2. At the prompt, type **edit_bvsrc** to start the bvsrc file-edit program.

```
- - -   F A C T O R Y    B V S R C    F I L E    E D I T  - - -
You will now interactively edit the Broadcast Video Server Runtime
Configuration file (/bvs/bvsrc).  This file is used to describe the
VME cardcage and video server to the System Controller.
Please read all directions on this list before pressing [Enter].
  (1)  After reading these directions, begin by pressing the [Enter] key.
  (2)  Enter an "h" after any question and you will see more information.
  (3)  When all entries have been completed, a preview of the file
       will be displayed.  If you choose to accept this file, it will
       be stored as (/bvs/bvsrc).  If you do not accept the file, you
       will return to the first question, and may make changes to your
       previous entries, or quit.
Press [Enter] to resume, or "n" & [Enter] to leave file unchanged:
```

3. Press Enter to continue.

```
============================================================================
                      MODEL NUMBER SELECTION

  Enter the index of the Model Number for this system:

    1  37T85A000  (MSS 8000 Shared Transwarp 9-slot mainframe)
    2  37T9xx00x  (MSS All models of 8000SI)


  MENU COMMANDS:
    [Enter]  Accept the default choice.       h   Print a help message
    q        Quit now and change nothing.

  Enter 1 through 2, or Menu Cmd (def = 1):
  ============================================================================
```

4. Enter 1.

```
=====================================================================
                   CONFIGURATION FILE GENERATION METHODS
      Do you want to manually enter the system configuration information
      such as the number of Encoders and the number of Decoders, or
      enable automatic detection of the system configuration?
      You still have a chance to override any of the values before the
      configuration file is generated.
      1. Enable automatic detection
      2. Manually enter the values
      q. Quit without generating the file
Enter your choice:  ( 1 )
```

5. Enter 1.

```
   =====================================================================
                     SCANNING VME BACKPLANE FOR BOARDS

    Scanning for Video Input ports: ................
      Type:  422  (1 of them)

    Scanning for Video Output ports: ................
      Type:  422  (1 of them)

    Scanning for the Fibre Channel board: ...
      fibreNum 1

    Scanning for the Archive SCSI board: ....
      archiveNum 0

    Scanning for the Analog boards: ...
      analogNum 0

  Scan is complete.  Shared Video Storage will need to be manually
```

6. Press Enter.

```
===============================================================================
                        S8000 LOCAL HOSTNAME SELECTION

   Enter the hostname for this server.  The hostname must be of the form
   mss{CC}{NN}.  {CC} is the two-digit Cluster number which may range
   between 1 and 99 inclusive.  {NN} is the two-digit node number, which
   may range between zero and 16 inclusive.  A leading zero is required
   for {CC} or {NN} if the respective numeric is less than ten.  In the
   following sample hostnames, the first five are for Cluster one and the
   last is for Cluster five.

   HOSTNAMES:
         mss0100        mss0102        mss0501
         mss0101        mss0103

   MENU COMMANDS:
     [Enter]  Accept the default choice.      h   Print a help message.
     q        Quit now and change nothing.

   Enter the S900 hostname, or Menu Cmd (def = mss10017.Press "a" to accep
```

7. Verify that the hostname is correct and press Enter to select the default choice.

```
===============================================================================
                  S900 FILE SYSTEM CONTROLLER (FSC) HOSTNAMES

 Enter the hostname of one FSC controllers, or enter the hostname of two FSC
 controllers separated by a space.  The format of these hostnames are very
 specific for the S900.  Please use the help (h and ENTER) for further
 details.

 MENU COMMANDS:
   [Enter]  Accept the default choice.      h   Print a help message.
   q        Quit now and change nothing.

 Enter names or Menu Cmd (def = fsc1001-1 fsc1002-1):
```

8. Verify that the FSC hostnames are correct and press Enter.

```
    =======================================================
                    SYSTEM CONFIGURATION SETTINGS


                            Current Value   AutoDetected   Existing bvsrc
                            -------------   ------------   --------------
Model number ..............   37N85A000        (n/a)         37N85A000
Host name .................    mss1001        mss1001         mss1001
Num Enc/Dec/Analog Bds .....  1 / 1 / 0      1 / 1 / 0       1 / 1 / 0
System Type In/Out .........   422/422        422/422         422/422
Shared Video File System ...    true           (na)            true
Shared FSC1 Hostname .......   fsc1001-1       (n/a)             0
Shared FSC2 Hostname .......   fsc1002-1       (n/a)             0

Choices:
      a.   Accept the Current Values         h. Help on this menu
      m.   Modify the Current Values         q. Quit

Choice: ( a m h or q;   default = a )
```

9. Press a to select the Current Value.

```
Generating configuration file:
  -------------------------------------------------------------
  The following lines show what the bvsrc file would look like:
  -------------------------------------------------------------


FILEID:          BVSCFGFILE              # HP Video Broadcast Server
```

10. The script generates a copy of the new bvsrc file that you can review. Press the space bar
    to advance through the file screen by screen. Verify that the file connects are correct.

```
WARNING:   Answering "yes" to the following question
  will write over the existing file /bvs/bvsrc.
  Do you wish to save this bvsrc file?   (y/n/q; def=n):
```

11. If the file appears to be correct, press y to accept any changes.

Saving Site Files

When you have verified that these files are set up correctly, enter **startams** to complete the
boot sequence of the server node. The node will use the bvsrc script to execute the sequences
required to initialize hardware and start the AMS operating program. When you see the
following output, AMS has started successfully:

```
 LAN Comport Init...
        [0]  [1]  [2]  [3]  [4]  [5]  [6]  [7]  [8]  [9]
        [10] [11] [12] [13] [14] [15] [16] [17] [18] [19]
        [20] [21] [22] [23] [24] [25] [26] [27] [28] [29]
        [30] [31] [32] [33] [34] [35] [36] [37] [38] [39]
        [40] [41]
Initialization Complete.
"HP:37N85A000 running"
[root@0101 /bvs]
```

1. At the prompt, type **sitefiles2file**.

```
root@02 /bvs] sitefiles2file

 This sitefiles save operation would overwrite the file  /tmp/sfiles.cpio.
 Is it ok to overwrite this file with the latest sitefiles? (y/n) (def=y)
```

2. If site files have been saved before, this operation will overwrite them. Since you have checked configuration, and may have changed one or more settings, press y.

   A list of the site files saved will display in the window followed by notification the process has been completed.

```
etc/group
    etc/hosts
    etc/fchosts
    etc/sitefiles.cfg
    etc/srconf/agt/snmpd.cnf
    88 Blocks

   --->>  sitefiles copied to '/tmp/sfiles.cpio':

[root@0101 /bvs]
```

The site files have now been saved as a .cpio file on the node. To protect these site files, store them on the MSi PC or copy them to a CD.

3. With the MSi Control Panel, open the MSi for the server node.

Site File Protection Backup

4. From the MSi menu, select Setup > Sitefiles > Save Sitefiles from Server to Console PC. In the resulting dialog box, enter the location to which you want to save the sitefiles.

   This command copies the .cpio file to the MSi PC and renames it <hostname>.cpio; for example, mss0101.cpio.

Saving Sitefiles to CD Disc

To save a copy of these site files on a rewritable CD disc:

1. Insert a formatted CD-recordable disc in your MSi PC and open the MSi application.

2. Drag and drop the *.cpio files onto the Instant Write window to back them up to the CD.

Avid Instant Write
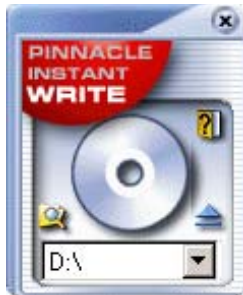
3. Remove the disc and Label it Site Files <hostname>. Date it and place it in a safe place.

The new MSi PC provides a USB port on the back of the unit. An alternate method to save files is to insert a USB drive in the available port and save files to the drive.

Chapter 8
Palladium Store 1000 Administration

This chapter covers the following topics related to Palladium Store 1000 administration:

- Array controller functions
- Communicating with the storage array
- Monitoring the storage array with the MSi
- Disk dialog
- Array dialog
- Rebuilding disks
- SNMP configuration
- Using the array_services utility

Palladium Store 1000 Storage System

Each MSS Networked Storage System has one or more Palladium Store 1000 storage arrays. Each array consists a chassis with a Controller and 10 disks (in two disk sets). A disk set consists of five disks (four data disks and one parity disk). Figure shows the Palladium Store 1000.

Controller hardware manages the disk controller functions, which include:

- Creating and writing data
- Checking parity data
- Monitoring disks array status and reporting errors
- Rebuilding disks

PS 1000 Array - Front Bezel
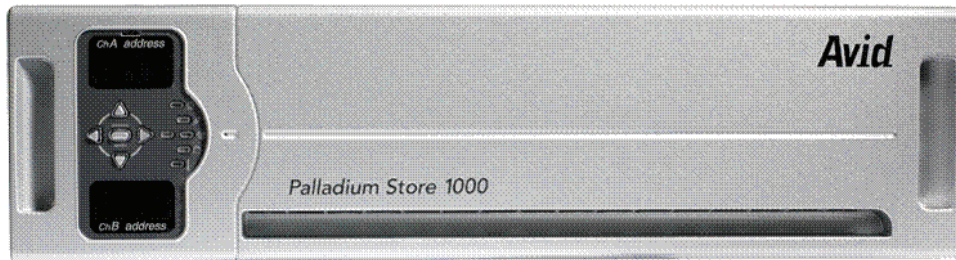
PS 1000 Array - Front Bezel Removed
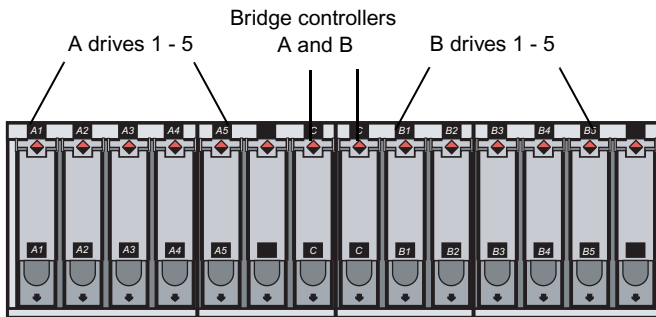
You can communicate with the storage array(s) via the MSi's System Status window or the array_services utility. Use the MSi's System Status window for normal monitoring. The array services utility provides additional tools for disk storage administration via a command-line interface (see "Array Services Utility" on page 183

Using MSi to Monitor the Storage Arrays

In the event of a malfunction, the System Status button on the MSi turns red. Clicking this button displays the System Status window in which the affected array enclosure is indicated by a change in color. If you click the enclosure, the failed component appears in

System Status Window
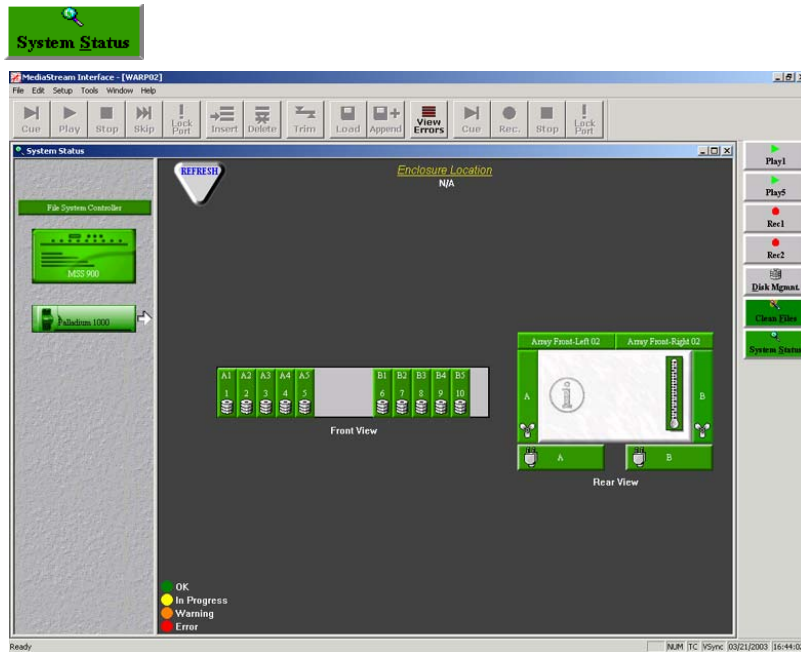
The left panel of the window displays icons of the enclosures being monitored. A system with multiple arrays will have a separate indicator for each array. Click an enclosure icon to display the enclosure in the system status window.

Icons that function as buttons represent the power supplies, disks, array controllers, fans, and system enclosure. Clicking any one of these buttons displays the status for that item. Clicking the Refresh button updates the display.

Clicking in the center section of the Rear View icon opens the Enclosure Information dialog box. This window displays the temperature status of the enclosure and other enclosure information.

Disk Array Dialog Box

Clicking the Array button opens the Disk Array dialog box, which has four panes:

Disk Array Dialog
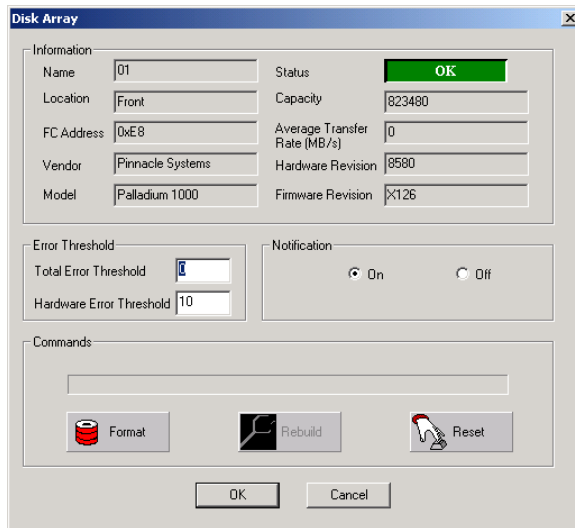
- Information

  The Information pane lists the name of the array, the user-defined location, FC address (in hexadecimal), status of the array, disk capacity, average transfer rate, and the hardware and firmware revision number.

- Error Threshold

  Total Error Threshold determines when the array LED changes to orange (indicating a warning, which is an intermediate error). The default setting is 0, which means no reporting occurs. You can set a number to determine when the orange warning state triggers (start with 25).

  The Hardware Error Threshold determines how many hardware errors are required to trigger a warning state. The default setting is 10.

- Notification

  Notification is normally set to off. If you set it to on, SNMP updating occurs within 50 seconds rather than every two minutes.

- Commands (the buttons in this pane are not used).

Disk Dialog Box

There are ten labeled disk buttons representing each of the ten disks in the array. Clicking a button opens the Disk Dialog box for that disk.

Sample Disk Dialog
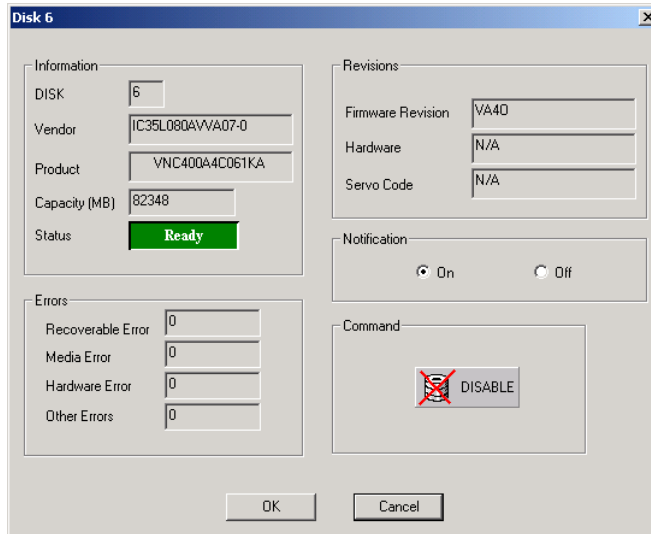
There are five panes in this dialog box:

• Information

• This section lists the following: Disk number, Vendor, Capacity, and Status. Status can be Ready, Rebuild or Failed.

• Errors

The Errors section displays four types of errors. Large numbers of Recoverable Errors and Media Errors (100 or more) should be cause for concern and may require disabling and a disk to prevent potential failure. In the event of Hardware Errors, contact Avid MediaStream Support. Other Errors can be ignored.

• Revision

Shows the firmware revision number.

• Notification

The Notification field is turned off by default. In this state status is reported on the disks every two minutes. Turning notification on, changes reporting status to every 50 seconds.

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- Command

  Do not attempt to disable a drive before changing disks. To replace a malfunctioning disk, simply remove it and replace it with a replacement disk. A new disk inserted in its place automatically begins to rebuild, which can take several hours. Make sure the Array is running in an uninterrupted manner to accomplish this task.

If two or more disks in an array fail, the entire array stops functioning and all data on the array will be lost.

Rebuilding Failed Disks

Because the array is formatted at the factory, no reformatting is required. Should the disk ever need reformatting, contact Avid MediaStream Support for assistance.

Failed disks are indicated by a Red LED above the Drive. When you replace a failed disk, disk rebuild commences automatically. A rebuild calculates the lost data from the parity disk and remaining data disks and adds it to the new disk. For information on replacing drives see "Replacing a Drive" on page 241.

Do not attempt firmware updates on any system that has a failed drive in one or more arrays. No software or firmware upgrades should be performed on any malfunctioning system.

Formatting an Array

Because the array is formatted at the factory, no reformatting is required. Should the disk ever need reformatting, contact Avid MediaStream Support for assistance.

Creating a File System

The formatted array contains its own file system. Creating a new file system destroys all content. If you need to create a new file system, contact Avid MediaStream Support for assistance.

Adding Arrays

A MSS 8000 can support up to eight array chassis. Array chassis can be added in volume sets. The initial disk set will determine how additional storage can be added to your system. For example, if the original unit consists of two arrays, additional storage can be added in volume sets of two to a maximum of eight array chassis, or four volume sets of two array chassis each.

For information about adding arrays, contact Avid MediaStream Support.

SNMP Configuration

Simple Network Management Protocol (SNMP) enables the monitoring of fans, power supplies, chassis, disks, the Controller, and the Video File System. Monitoring relies on two processes: polling, in which SNMP periodically reports its status to the MSi PC or other monitoring computer (default polling is every two minutes), and trap notification, in which SNMP sends an alarm within 50 seconds of a failure.

To enable SNMP monitoring, a program called snmp_config is run. The snmp_config program configures the server to report status information via the array_services command and the MSi System Status window. If you have multiple servers, SNMP needs to be configured on each so that the MSi PC can monitor system components.

SNMP is first run at the factory. When you add a new server or array chassis, you need to run this application to report the new hardware to the MSi. Also run SNMP after upgrading the server software. Although the SNMP script is long, most information requests require that you press Enter. The procedure is described in detail on the following pages.

Running snmp_config

1. From the /bvs directory, enter the command: `snmp_config.`

```
- - -   S N M P   C O N F I G U R A T I O N   - - -

This interactive utility will allow the user to configure either or
both of the two SNMP configuration files, the Master Agent configuration
file /etc/srconf/agt/snmpd.cnf, and the Disk Subagent configuration file
/bvs/cfg_files/hpMsvs.cnf.  Note that the program will replace the
content in the existing files.

We will begin with the Master Agent configuration file.

Press [Enter] to continue, or "s" & [Enter] skip this segment
and begin with the Disk Agent's configuration file:
 ===============================================================================
```

2. Press Enter to run the entire script.

```
 SYSTEM LOCATION

  At the prompt, enter a single line description of the location for
  this MediaStream Server.  This description will be returned in
  response to an SNMP get request for the variable sysLocation.0 Note, a
  server may be composed of multiple enclosures each with a different
  location.  You will be prompted for enclosure locations at a later
  time.  Here you may wish to enter a more general description of the
  system's location than that of its enclosures, or you may wish to
  enter the location of the main enclosure -- the one containing the
  system processor.  If you press [Enter] without typing any characters,
  a default location of:

""

  will be used.

Type a one line description of location on the following line
Support Lab
```

3. If no default location has been noted, enter the location of the system.

```
SYSTEM HOST NAME
At the prompt, enter the host name for the processor board inside this
MediaStream Server.  If you do not know the host name, quit this
application and type "hostname" on the command line of the System
Administration window.  You will likely see something like:  hpmss001.
This will be the name returned in response to an SNMP get request for
sysName.0.  If you press [Enter] without typing any characters, a
default IP name of:
  "mss0101"
 will be used.
 Type the system host name and press [Enter]:
```

4. The system host name request should return the value of the host name for this server.
   Press Enter to accept this value.

```
TRAP NOTIFICATION

  At the prompt, enter the IP address, in dotted decimal format, for
  each manager station configured to receive SNMP Trap Notifications.
  Typically, this would be the IP address of the PC running your MSI
  application.  Enter as many addresses as you like, but only one per
  prompt.  If a default IP address is offered, you may press the [Enter]
  key to accept this address, or type a new address.  Type "s" and
  [Enter] to skip to the next segment.

  Type an IP address (def=10.64.1.3):
  Type an IP address (no default):
```

5. Trap Notification allows external PCs to receive reports of system status (normal notification occurs every 2 minutes). Enter the IP address of the MSi PC (or other computer receiving trap notification). The Primary MSi PCs IP address is 10.xx.yy.5 with <xx> for cluster ID and <yy> for the network ID of the server in question. An address of 10.64.1.5 would be correct as the address from Server Node 1 to the MSi PC.

```
                    REVIEW SNMP.CNF

A temporary version of the Master Agent configuration file has been
written to /tmp/snmpd.tmp.  If you would like to review the file, select
[Enter] at the prompt and the file will be displayed on the screen.

Press [Enter] to continue, or "s" & [Enter] skip the review:
```

6. Press Enter to review the data you entered, or press the *s* key to skip this step.

```
# Entry type: sysDescr
# Entry format: octetString
sysDescr  "MediaStream Server"

# Entry type: sysObjectID
# Entry format: OID
sysObjectID  enterprises.11.2.34.5

# Entry type: sysLocation
# Entry format: octetString
sysLocation  "/Support Lab"

# Entry type: sysContact
# Entry format: octetString
sysContact  ""

# Entry type: sysName
--More--# Entry format: octetString
sysName  mss0101

# Entry type: snmpEnableAuthenTraps
# Entry format: integer
snmpEnableAuthenTraps  1

# Entry type: MAX_THREADS

# Entry format: integer
MAX_THREADS  10

# Entry type: MAX_PDU_TIME
# Entry format: integer
MAX_PDU_TIME  2500

# Entry type: MAX_OUTPUT_WAITING
# Entry format: integer
MAX_OUTPUT_WAITING  65536

# Entry type: MAX_SUBAGENTS
# Entry format: integer
MAX_SUBAGENTS  10

# Entry type: subagent
# Entry format: octetString

# Entry type: community
# Entry format: octetString
#              integer
#              integer
#              integer
```

Display of contents of file you're just confgured. Press space bar to scroll to the next page.

7. The server reports the data you entered and the hardware data detected by SNMP. Several screens of data are displayed. Press the Space bar to advance to the next screen of data.

```
================================================================================
                            WRITE FINAL VERSION

 If you would like to accept the new Master Agent configuration file,
 select [Enter] at the prompt, and the temporary file /tmp/snmpd.tmp
 will replace the existing file /etc/srconf/agt/snmpd.cnf.
 NOTE:  The current contents of /etc/srconf/agt/snmpd.cnf will be lost.

 If you choose to skip this step, both /tmp/snmpd.tmp,
 and /etc/srconf/agt/snmpd.cnf will remain unchanged.

 Press [Enter] to replace file, or "s" & [Enter] to skip:
```

8. Press Enter to save the changes.

```
File has been replaced.  Press [Enter] to continue.
  ========================================================================
```

9. Press Enter to continue.

```
================================================================================
                            RESTART MASTER AGENT

The changes you have made to the Master Agent configuration file will not
be recognized until the agent restarts.  Would you like to restart the
Master Agent now?  Note:  stopping the Master Agent now will cause the
Disk Subagent (hpMsvsagt) and the VFS Subagent (hpMsvsVfsagt) to be
stopped if they are running.  They will have to be restarted manually.

Press [Enter] to restart Master Agent, or "s" & [Enter] to skip:
```

10. Press Enter to restart the Master Agent.

```
 SNMP Research SNMP Agent Resident Module Version 15.1.1.8
 Copyright 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998
 Research, Inc.


   Agent has been restarted.  Press [Enter] to continue.
```

11. Press Enter to begin configuration of the Disk Subagent.

```
===============================================================================
                         DISK SUBAGENT CONFIGURATION

 You will now be asked several questions which will be used to set up
 the Disk Subagent's configuration file /bvs/cfg_files/hpMsvs.cnf.

 Press [Enter] to continue, or "s" & [Enter] skip this segment
 and quit the program:
===============================================================================
                           LIST OF ARRAY INDEXES

 This network storage Cluster consists of several array enclosures.
 The following array IDs have been read from the current configuration
 file:
 2

 [Enter] to accept this list, or type a new list:
```

12. Array IDs for each configured array display. Array IDs are numbered consecutively from 2, which indicates the first array. Verify that all arrays are listed, and press Enter.

```
===============================================================================
                            TRAP NOTIFICATION

The MediaStream Server may be configured to issue SNMP Trap Notifications
in the event of certain fault conditions.  Do you wish to enable Trap
Notifications?

Type "y" or "n" then press [Enter] (def=n):
```

13. To enable trap notifications, enter **y**.

```
===============================================================================
                  ENCLOSURE #1 CONSISTS OF THE FOLLOWING:

  PRODUCT_ID:  "MediaStream Server -- Series 900 -- SAN Configuration"
  Component:   37N85A000
  Redundant Fan Configuration
  RDLocationStatus
  M1Bottom-RightOK
  R1Bottom-LeftOK
  Redundant Power Supply Configuration
  RDLocationStatus
  R2Top-LeftOK
  R1Bottom-LeftOK
  M2Top-RightOK
  M1Bottom-RightOK
  Press [Enter] to accept and continue, or "q" to quit:
```

14. A report of the status of the MSS 8000 enclosure is displayed. Review it to make sure that it accurately reflects the specified enclosure, and then press Enter.

```
                         LOCATION OF ENCLOSURE #1

  At the prompt, enter a single line description of the location for
  this enclosure.  This description will be returned in response to an
  SNMP get request for the variable hpMsvsBoxLocation.1 If you press
  [Enter] without typing any characters, a default location of:

  ""

  will be used.

  Type a one line description of location on the following line.
 Support Lab
```

15. Enter the location of the MSS 8000 for identification purposes.

```
  ENCLOSURE #2 CONSISTS OF THE FOLLOWING:
   PRODUCT_ID:  "Palladium 1000"
   Component:
   Redundant fans and Power Supplies
   Press [Enter] to accept and continue, or "q" to quit:
```

16. The location of the array chassis and Controllers is displayed. Review this and press Enter.

📄   *If you have more than one configured array chassis, information is displayed for each.*

```
LOCATION OF ENCLOSURE #2

At the prompt, enter a single line description of the location for
this enclosure.  This description will be returned in response to an
SNMP get request for the variable hpMsvsBoxLocation.2 If you press
[Enter] without typing any characters, a default location of:

"Lab"
will be used.

Type a one line description of location on the following line.
lab
```

17. Enter the location of the array chassis.

```
REVIEW HPMSVS.CNF

A temporary version of the Disk Subagent configuration file has been
written to /tmp/hpMsvs.tmp.  If you would like to review the file, select
[Enter] at the prompt and the file will be displayed on the screen.

Press [Enter] to continue, or "s" & [Enter] skip the review:
```

18. You have the option of reviewing the SNMP configuration data. In most cases, this is unnecessary and you can press the **s** key to skip this step. If you do view the data, press the space bar to view the next screen of data.

```
FILEID:HPMSVSCNFFILE# MediaStream Server
REV:3.0#  config. file format
                                              #  rev. num.

#  The objects managed by the hpMsvsagt subagent, are defined in the
#  hpMsvs.my, hpMsvsBox.my, hpMsvsDa.my, hpMsvsPs.my, and hpMsvsFan.my
#  MIB files.  They are located under the private.enterprises subtree as
#  shown below:
# #                 iso(1).org(3).dod(6).internet(1)
#                               |
#                           private(4)
#                               |
#                         enterprises(1)
#                               |
#                            hp(11)
#                               |
#                            nm(2)
#                               |
#                       hpMediaStream(34)
#                               |
#        ._____.
--More--#        |                      |                       |
#    hpMsvs(5)               msi(6)              automation(7)
#       |
#    ._____.
#    |                   |                     |
#  cfg(1)          hardware(2)           software(3)
#                       |
#                  hpMsvsBox(1)
#                       |
#        ._____.
#        |                   |                   |
#  hpMsvsBoxObjs(1)    hpMsvsBoxEvents(2)  hpMsvsBoxConf(3)
#        |
#        ._____.
#        |            |           |          |           |        |
#  hpMsvsDiskArray(1) hpMsvsPs(2) hpMsvsFan(3) hpMsvsEnc(4) hpMsvsDec(5) |
#        |            |           |                       |
#  hpMsvsDaObjects(1)     |     hpMsvsFanObjects(1)        |
#        |        hpMsvsPsObjects(1)|              hpMsvsDisk(7)
#     ._____.    |       hpMsvsFanTable(1)               |
#     |        | hpMsvsPsTable(1)                           |
#  hpMsvsDaTable(1)|                                        |
--More--#          |         ._____.
#     hpMsvsDaDiskTable(2)  |               |               |
#            hpMsvsDiskObjects(1)  hpMsvsDiskEvents(2)  hpMsvsDiskConf(3)
#                     |
#              hpMsvsDiskTable(1)
```

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```
#  This MIB defines several tables within tables.  The following configuration file specifies
the values of several of the leaf-nodes or table variables managed by the subagent hpMsvsagt.

# Entry type:  hpMsvsVendorID
# Entry format: octetString
VENDOR_ID:  "Avid MediaStream SupportSystems"

# Entry type:  hpMsvsProductID
# Entry format: octetString
PRODUCT_ID:  "MediaStream Server -- Series 900 -- SAN Configuration"

# Entry type:  hpMsvsOptionsList
--More--# Entry format: octetString
OPTION_LIST:  "N/A"

# hpMsvsBoxTable-- Represents each seperate box in the hpMsvs system.
#          BoxIndex  BoxTypeId BoxTempAlarm    BoxLocation
#          integer    integer    integer       octetString
BOX_TABLE:    1         5         -1            "Lab"
BOX_TABLE:    2         7         -1            "lab"

# hpMsvsDaTable-- Represents the disk arrays within each box.
#      BoxIndex DaIndex  DaCompId  DaUserNo DaLoc   DaErrT DaHwErrT DaStAlrm
#      integer  integer  octetStr  integer octetStr integer integer integer
DA_TABLE: 1      1   "N/A"    1   "Front"   0      10       -1

# hpMsvsPsTable-- Represents each seperate power supply within a box.
#    BoxIndex  PsIndex  PsName PsLocation  PsStatusAlarm
#    integer   integer octetStr octetStr      integer
PS_TABLE:    1        1      "A"  "Rear-Top"     -1
PS_TABLE:    1        2      "B"  "Rear-Bottom"    -1
--More--

# hpMsvsFanTable-- Represents each seperate fan within a box.
#      BoxIndex FanIndex FanName FanLocation  FanStatusAlarm
#       integer  integer octetStr octetStr       integer
FAN_TABLE:    1        1      "A"  "Rear-Top"     -1
FAN_TABLE:    1        2      "B"  "Rear-Bottom"    -1

# hpMsvsDaDiskTable-- Represents each seperate disk within a disk array.
# BoxIndex  DaIndex  DiskIndex  DiskStatusAlarm
#   integer integer   integer      integer
DA_DISK_TABLE:     1       1       1           -1
DA_DISK_TABLE:     1       1       2           -1
DA_DISK_TABLE:     1       1       3           -1
DA_DISK_TABLE:     1       1       4           -1
DA_DISK_TABLE:     1       1       5           -1
DA_DISK_TABLE:     1       1       6           -1

DA_DISK_TABLE:     1       1       7           -1
DA_DISK_TABLE:     1       1       8           -1
DA_DISK_TABLE:     1       1       9           -1
DA_DISK_TABLE:     1       1       10          -1
  Press [Enter] to continue:
```

```
WRITE FINAL VERSION

 If you would like to accept the new Disk Subagent configuration file,
 select [Enter] at the prompt, and the temporary file /tmp/hpMsvs.tmp
 will replace the existing file /bvs/cfg_files/hpMsvs.cnf.
 NOTE:  The current contents of /bvs/cfg_files/hpMsvs.cnf will be lost.

 If you choose to skip this step, both /tmp/hpMsvs.tmp,
 and /bvs/cfg_files/hpMsvs.cnf will remain unchanged.

 Press [Enter] to replace file, or "s" & [Enter] to skip:
```

19. Press Enter to accept the changes and write the final version to the disk. Reboot the server to initialize the changes.

Array Services Utility

The array_services utility allows you to monitor and administer the storage system from a command-line interface. This utility translates graphical information available in the MSi System Status window into text format. You will use this utility to upgrade the disk array firmware, rebuild disks, and format arrays.

To display status information for a storage array, including rebuild status, online status for each drive, and power supply and fan status, enter:

array_services array<n>

where *n* is the number of the array.

The first array is always Array 02.

```
 [root@0101 /bvs] array_services array02
 DEVICE STATUS:
  Chassis Type:  Palladium 1000
conroller..1
  Controller Box Temp (celcius): 31
 ARRAY STATUS:
   Rebuild Bank A: Not Active
   Rebuild Bank B: Not Active
   Bank A
     Drive 1: ONLINE
     Drive 2: ONLINE
     Drive 3: ONLINE
     Drive 4: ONLINE
     Drive 5: ONLINE
     Drive 6: ONLINE
     State:   Redundant
   Bank B
     Drive 1: ONLINE
     Drive 2: ONLINE
     Drive 3: ONLINE
     Drive 4: ONLINE
     Drive 5: ONLINE
     Drive 6: ONLINE
     State:   Redundant
Redundant Power Supply - Fan Status:

   Power Supply 1: OK   Power Supply 2: OK

   Fan A: OK   Fan B: OK
```

To view additional tools available from array services enter `array_services -h`.

```
[root@0101 /bvs] array_services -h
 array_services  [option -- only one per call]  device

Options for Ciprico and Palladium 1000:
 device         May be of the form "array01, array02..." or
                "/dev/fcdss0101, /dev/fcdss0102..."
 [no options]   Prints array and disk status, board temperatures,
                and % completion for formats and rebuilds
 [-l page]      Prints log page in human readable form.  The
                following are legal values for page:
                Ciprico Pages:
                 0x1     -Command counters
                 0x2     -Block size counters
                 0x3     -Disk error counters
                 0x4     -Last 40 drive errors
                 0x5     -Last 15 drive failures
                 0x6     -Fibre channel diagnostic status
                          (not supported by FibreStore)
                 0x7     -Throughput
                 0x8     -FC Loop Event Count (FS - only)
                 0x9     -CDB stats (FS - only)
                 0x34    -Extended drive errors (last 40)
                 0x3E    -Log page status (on/off)
                Palladium 1000 pages:
                 1       - Version information and Drive Capacity
                 2       - Configuration information
                 3       - Controller information, power supply and
                            fan status, and rebuild status
                 4       - Drive status
                 5       - Format status
                 9       - Drive details
                 10      - Bad Block information
 [-d drive]     Disable a drive.  Legal values for drive are
                1 - 9 (Ciprico) or 1-10 (Palladium 1000)
 [-e drive]     Enable a drive.  Legal values for drive are
                1 - 9 (Ciprico) or 1-10 (Palladium 1000)
 [-s]           Restart array software.  This is equivalent to
                a power-on reset.  Do not use while server running.
 [-b file]      Download firmware to bootrom.
                If FibreStore array, must specify -I.
 [-I id]        Id of controller target ( 1 | 2 | A | B ).
 [-t]           Read main-frame temperature and fan status.
 [-h]           Prints this menu.  Use -H for factory-only features.
Ciprico Only Options:
 [-c page]      Clears log page.  Legal values for page are the
                same as above.  Also turns logging on for page.
 [-T]           Clears drive error thresholds.
 [-r]           Rebuild a drive. Fmt 1st; mode pages unchanged.
 [-f]           Format the array.  Do not use while server running.
 [-q]           Quick format all disks (does not substitute for
                a full format).  Do not use while server running.
```

Disk Errors and Drive Failures

      array_services -l 4 array\<n\> where *n* is the number of the array in question.

```
[root@1102 /users.ws/atenold/san.1] array_services -l4 array02
PAGE 0x04
-------------------------------------------------------------------
Page Code:   0x04
Page Length: 93
Reserved0: 0x0
Reserved1: 0x0
Reserved2: 0x0
Reserved3: 0x0
Drive Status:
   BankA - Drive1: NOT ONLINE
   BankA - Drive2: ONLINE
   BankA - Drive3: ONLINE
   BankA - Drive4: ONLINE
   BankA - Drive5: ONLINE
   BankA State:    Non-Redundant
   BankB - Drive1: ONLINE
   BankB - Drive2: ONLINE
   BankB - Drive3: ONLINE
   BankB - Drive4: NOT ONLINE
   BankB - Drive5: ONLINE
   BankB State:    Non-Redundant
Reserved4: 0x0
BankA Drive1
   State:   Spun Down
   Message: Drive spun down from GUI
   Number of read dropout errors:  0
   Number of bank dropouts:        0
   Number of read timeout errors:  0
   Number of write timeout errors: 0
BankB Drive2
   State:   Online
   Message: No message to report
   Number of read dropout errors:  0
   Number of bank dropouts:        0
   Number of read timeout errors:  0
   Number of write timeout errors: 0
```

```
BankA Drive3
   State:   Online
   Message: No message to report
   Number of read dropout errors:  0
   Number of bank dropouts:        0
   Number of read timeout errors:  0
   Number of write timeout errors: 0
BankA Drive4
   State:   Online
   Message: No message to report
   Number of read dropout errors:  0
   Number of bank dropouts:        0
   Number of read timeout errors:  0
   Number of write timeout errors: 0
BankA Drive5
   State:   Online
   Message: No message to report
   Number of read dropout errors:  0
   Number of bank dropouts:        0
   Number of read timeout errors:  0
   Number of write timeout errors: 0
```

Current Firmware Revision

scsi_inquiry array<n>

where **<n>** is the number of a given array.

⚡ **Do not run this command when your system is on-air. It may impact on-air operation.**

Current firmware revision is published with the software release installation guides. If you are unsure what current revision to use, check with Avid MediaStream Support.

```
Device 'array02' converted to device name '/dev/fcdss0102'.
Drive type string = Medea SR12 FC   X125SN: 00000000x024    .
Product ID:Medea SR12 FC   X125SN: 00000000x024
dev_type = Palladium 1000
-------------------------------------------------------------------------
```

Array Capacity

`array_services -l 1 array<n>` where <n> is the number of a given array.

```
PAGE 0x01
-------------------------------------------------------------------------
Page Code:   0x01
Page Length: 73
Reserved0:   0x0
Controller Firmware Checksum: 50947
FPGA Checksum:  60904
Reserved1: 0x0
Reserved2: 0x0
CPU Version:    47
SWX Version:    5
Buffer Version: 32
Host Version:   2
Reserved3: 0x0
Reserved4: 0x0
Reserved5: 0x0
Reserved6: 0x0
Bridge 0 FRAID or FPGAPGA version: 86
Bridge 0 IDE01 FPGA version:      48
Bridge 0 IDE23 FPGA version:      48
Bridge 0 IDE45 FPGA version:      48
Bridge 1 FRAID or FPGAPGA version: 86
Bridge 1 IDE01 FPGA version:      48
Bridge 1 IDE23 FPGA version:      48
Bridge 1 IDE45 FPGA version:      48
Reserved7: 0x0
DiskCap :0 0 0 0
Disk Capacity BankA Drive1 (MB): 123522
Disk Capacity BankA Drive2 (MB): 123522
Disk Capacity BankA Drive3 (MB): 123522
Disk Capacity BankA Drive4 (MB): 123522
Disk Capacity BankA Drive5 (MB): 123522
Disk Capacity BankB Drive1 (MB): 123522
Disk Capacity BankB Drive2 (MB): 123522
Disk Capacity BankB Drive3 (MB): 123522
Disk Capacity BankB Drive4 (MB): 123522
Disk Capacity BankB Drive5 (MB): 123522
Reserved8: 0x0
```

Drive Information (cap, status, manufacture/f/w rev)

```
array_services -l 4 array<n>
```

where <n> is the number of a given array (see "Disk Errors and Drive Failures" on page 186).

```
array_services -l 9 array<n>
```

where <n> is the number of a given array. As with the previous command, this page displays information for all drives in the array. For display purposes, only the first two drives are shown.

```
PAGE 0x09 DRIVE INFORMATION: Bank A Drive 1
-----------------------------------------------------------------------
Page Code:     0x9
Page Length:   77
Reserved0:     0x0
Reserved1:     0x0
Num of drives: 10
Bank A, Drive 1:
   Drive model number: IC35L120AVV207-0
   Reserved2: 0x0
   Drive serial number: VNC403C4C4ZJ2B
   Reserved3: 0x0
   Drive firmware revision: V240A63A
   Reserved4: 0x0
   Reserved5: 0x0
   Reserved6: 0x0

PAGE 0x09 DRIVE INFORMATION: Bank A Drive 2
-----------------------------------------------------------------------
Page Code:     0x9
Page Length:   77
Reserved0:     0x0
Reserved1:     0x0
Num of drives: 10
Bank A, Drive 2:
   Drive model number: IC35L120AVV207-0
   Reserved2: 0x0
   Drive serial number:       VNC402A4C8ZH3A
   Reserved3: 0x0
   Drive firmware revision: V240A63A
   Reserved4: 0x0
   Reserved5: 0x0
   Reserved6: 0x0
```

Configuration

```
scsi_set_mode array<n> –s
```

where *n* is the number of a given array. Displays current configuration.

⚡ **Do not run this command without the direction of Avid MediaStream Support. It may impact on-air operation.**

```
scsi_set_mode array02 -s
Device 'array02' converted to device name '/dev/fcdss0102'.
PAGE 0x02
------------------------------------------------------------
Array stripe size (Bytes): 983040 (0xf0000)
Fibre channel loop ID (alpa index): 2
IDE Read Timeout (msec):  400
IDE Write Timeout (msec): 400
Non-Redun Check Condition State: 0x1
Gross timeout value: 1400 ms
```

Setting Configuration on a Networked Storage System

For Controller 1:

```
scsi_set_mode array<n> -I 1 -d
```

where *n* is the number of a given array

⚡ **Do not run this command without the direction of Avid MediaStream Support. It can impact on-air operation.**

```
Device 'array02' converted to device name '/dev/fcdss0102'.
You have chosen to set the read timeout to 400
You have chosen to set the write timeout to 400
You have chosen to set the gross timeout to 1400
You have chosen to set the stripe size to 983040
Are you sure(y or n)?y

Executing
```

For Controller 2:

```
 scsi_set_mode array<n> -I 2 -d
```

where <n> is the number of a given array.

```
Device 'array02' converted to device name '/dev/fcdss0102'.
You have chosen to set the read timeout to 400
You have chosen to set the write timeout to 400
You have chosen to set the gross timeout to 1400
You have chosen to set the stripe size to 983040
Are you sure(y or n)?y

Executing
```

Chapter 8 **Palladium Store 1000 Administration**

Chapter 9

Hardware Removal and Replacement (Server Nodes and Storage System)

This chapter describes how to replace hot-swappable components in the MediaStream products. As with any replacement procedure, it is important to understand exactly what each procedure involves and adhere to all precautions and warnings for each specific procedure.

All hardware components and boards are static sensitive. Anti-static precautions must be used when handling these devices. This includes the use of an anti-static mat and the use of anti-static wrist straps.

Never touch any exposed electrical connectors on the components as they can be damaged by electrostatic discharge (ESD). Do not handle components unless you are using the appropriate antistatic wrist or heel strap.

Field Replaceable Units (FRUs)

Each product in the MS System has a specific set of hot-swappable FRUs. The following is a list of MS products and their respective FRUs.

MSS 8000 Server (8000)

- Boot disk
- Decoders and encoders
- Fan tray
- Fibre Channel Adapter (FCA)
- Lantronix module
- Power supply
- Server nodes
- System controller board

Palladium Store 1000

- Controller
- Disk drive
- Power supply

File System Controller

- Disk drive
- Power supply

MediaStream Server

This section covers the replacement of MSS 8000 components. With the exception of the fan tray and power supply modules, all boards and components must be removed after the server has been shut down and turned off. Be sure to observe safe practices to avoid injury or damage to equipment.

Boot Disk Replacement

The MS server contains a boot disk drive, accessible from the front of the server. If a boot disk drive fails, remove and replace the boot disk drive. This procedure also requires the reinstallation of server software.

📄   *Because you cannot back up site files after a Boot Drive failure, back up site files on a regular basis. See "MSS 8000 Server (8000)" on page 193.*

To remove and replace the Boot Disk:

1. Ensure you are using an anti-static wrist strap or an anti-static mat

2. Stop and halt the server by issuing the stopams command (`stopams -H`), and then power the server down.

3. Firmly grasp the server bezel and remove the front bezel cover.

MS Server Front Plate (with bezel removed)

Retaining screws   Retaining screws
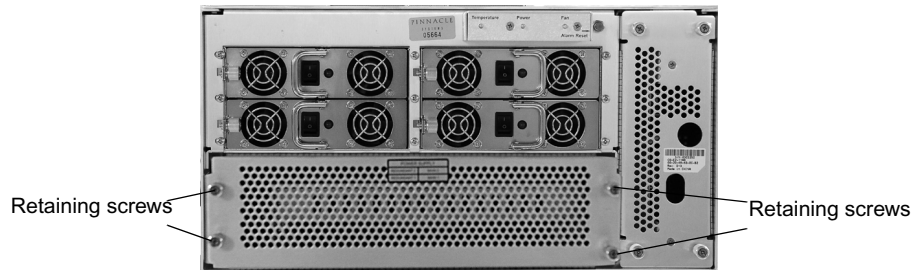
4. Loosen the four retaining screws of the front cover plate and remove cover.

Boot Disk
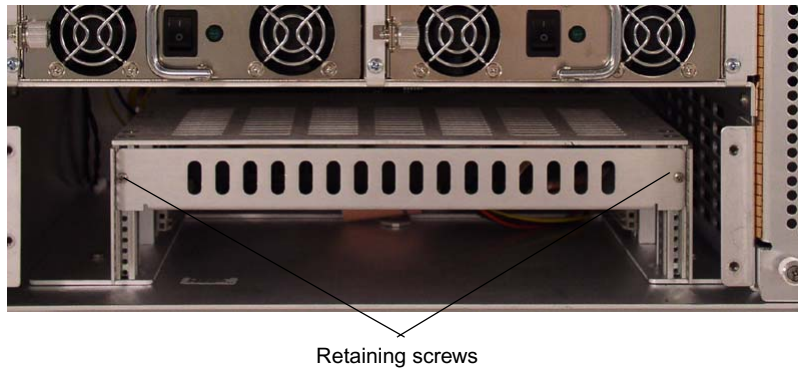
Retaining screws

5. Loosen the two retaining screws holding the boot disk tray in the unit.

6. Carefully slide the boot disk tray out.

7. Remove SCSI cable and unscrew drive from tray.

8. Replace with new drive reversing instructions above for installation.

Boot Drive Removal
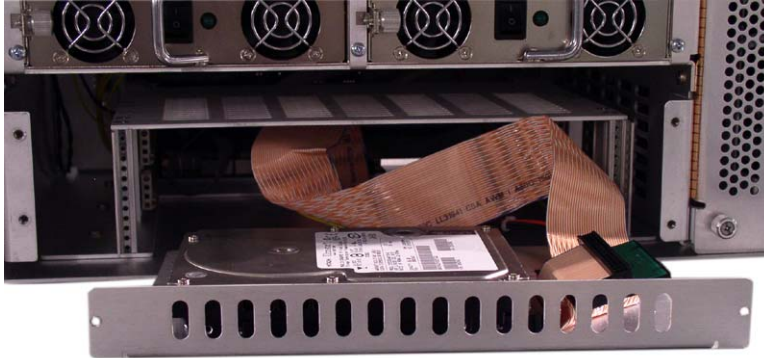
9. Connect the Serial cable to the Server Node and the MSI PC. See Connect RS-232 Cable to Server Node and MSi PC on page 233.

10. Power on the server node, and press ESC when the following prompt appears:

```
Autoboot command: "diskboot -x -d /dev/sd0 -o100 -l5000 -a100000 -- a;g -e 1000"
Press <Enter> to execute or any other key to abort.
```

11. Verify that the four bootrom monitor variables are set as shown below:

Enter **set bootaddr**

The boot address is the IP address for the TFTP server. This server runs on the MSi PC. The correct address is the VLAN address for connection between the Server Node and the MSi PC. This command returns the following:

PMON> bootaddr = 10.xx.y.5 (where xx equals cluster ID and y equals server ID).

If the value is incorrect, enter **set bootaddr 10.xx.y.5**
(where xx equals cluster ID and y equals server ID).

Enter **set ipaddr**

The IP address is the LAN address for the server node. This command returns the following:

PMON> ipaddr = 10.xx.y.3 (where xx equals cluster ID and y equals server ID).

If the value is incorrect, enter the correct value i.e. **set ipaddr 10.xx.y.3**

- Enter **set gateway**

The Gateway is the IP address for the external router connection. This command returns the following:

PMON> gateway = 10.xx.y.32 (where xx equals cluster ID and y equals server ID).

If the value is incorrect, enter the correct value.

- Enter **set netmask**

The netmask for MSS Networked storage systems should always be set as follows:

PMON> netmask = 255.255.255.0

📖 *See Networked Storage System I/P Addressing Scheme on page 56 for information on determining cluster ID.*

12. If any of the return variables are incorrect, enter the set command followed the correct variable.

13. Verify the flash boot string is present in the 'flashboot' PMON variable by entering:

    set flashboot

The following should return:

PMON> flashboot = "copy 78000000 100000 900000;g -e 100020"

If this value is not present enter:

    set flashboot "copy 78000000 100000 900000;g -e 100020"

14. When finished, enter **$flashboot**

This will execute the flashboot routine and flash the drive from the CPU RAM kernel. This will take a minute or so.

15. Wait for the following prompt to appear:

Install upgrade now ('no' => exit)? (y/n; def=y):

16. At this point, insert the current server software CD in the MSI PC CDROM drive. Follow the dialog on the MSI PC to execute the FTP transfer of data to the Server Node.

📖 *Refer to the Software installation instructions for your upgrade for specific instructions.*

17. When complete, enter **y** to begin the upgrade process.

Install upgrade now ('no' => exit)? (y/n; def=y):y

The upgrade begins. This may take a few minutes.

18. When prompted with the following, enter y:

    Is it ok to reboot the OS off the new disk kernel?
    (y/n; def=y):

    The system completes a reboot off the disk drive.

19. When the system has completed reboot press ESC at the following prompt:

```
Waiting 00:40 to start the MSS storage controller:
- Press <return> to start the MSS Server immediately.
- Press ESCAPE to end the timeout and bypass the MSS server startup.
{ 0:40} Waiting to start MSS Server.  (<Enter>=StartNow or <ESC>=DoNotS
```

20. Logon as **root**.

21. Restore Sitefiles as described below.

Restore the Site Files

To restore the site files:

1. Insert the CD with the site files into the MSi PC's drive.

2. Open the MSi application for the server.

3. From the MSi menu, select Setup > Restore Sitefiles to Server from Console PC > Local Disk. This command copies the site files (using ftp) from the MSi PC to the server.

4. From your telnet session, run the command file2sitefiles.

   This command will unzip the site files into its many configuration files and install the files in their proper place.

5. The server upgrade procedure modifies the site files. Save the site files.

Replacing the Boot Disk and the System Controller

To replace the Boot Disk hardware see steps 1-6 of *"Boot Disk Replacement" on page 194*. To replace the system controller see steps 1-6 of *"System Controller Board" on page 235*.

Consult with Avid MediaStream Support to determine if both the System Controller and the Boot Disk need replacement.

TFTP Startup

If both the boot disk and the system controller must be replaced, the system controller must be booted off a RAM kernel located on a TFTP server (on the MSI PC). The TFTP startup application expects the MSI PC and the server node to be part of the same cluster.

1. On the MSI, start the Avid MediaStream SupportTFTP application by double clicking the TFTP Server icon (on the MSi desktop). The Avid MediaStream SupportTFTP Server application will display the MSI PC name and prompt you to enter the node name or IP address of the server node being upgraded.

2. Enter the IP address or the hostname of the server node.

3. In the PumpKIN program window, verify that the TFTP server is set up correctly. The program window displays *PumpKIN started* in the message area of the window.

📖 *PumpKIN is a program designed to send and receive files over the net while having a Wintalk session running using TFTP (RFC1350) protocol. It includes a full-functional TFTP server/client so it may be useful for maintaining Cisco routers, Versanet ISP accelerators, and other network devices.*

This software is free for use and distribution as long as developers' credits are explicitly mentioned.

Developed by: Klever Group, Inc. (http://www.klever.net/)
Author: Michael Krelin (hacker@klever.net)
Copyright 1997,1998 Klever Group, Inc.
Fan mail send to gefilte@klever.net

Options Dialog Box
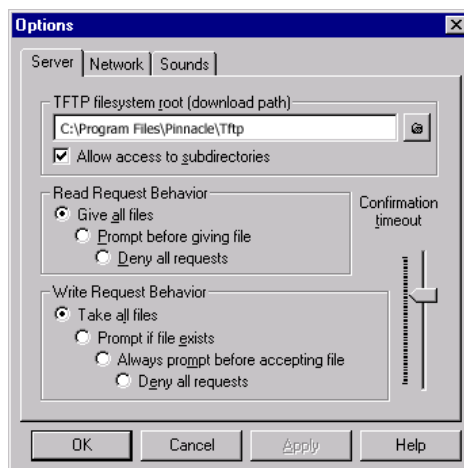
4. Click the Options button. The Options dialog box opens.
   Change settings to the following values if not already correct:

   - Select Give all files.

   - Select Take all files

   - Set TFTP filesystem root (download path) to C:\Program Files\Pinnacle\Tftp

   - Click OK to accept changes

5. Leave PumpKIN open on the desktop so that it can accept your TFTP download process.

6. Power on the server node. The following text appears:

```
   * PMON/2000 Professional *
   Configuration [SBS VG4,EB,NET,SCSI]

    Version: C03 (Avid MediaStream SupportCustom) 1.0 Build 1.21.5.
     Nov  5 2003 11:07:47

This software may be redistributed under the BSD copyright.
```

7. At the prompt, set the four bootrom monitor variables are set as shown below:

   Enter `set bootaddr 10.xx.y.5` (where xx equals cluster ID and y equals server ID).

   Enter `set ipaddr 10.xx.y.3` (where xx equals cluster ID and y equals server ID).

   Enter `set gateway 10.xx.y.32` (where xx equals cluster ID and y equals server ID).

   Enter `set netmask 255.255.255.0`

See Networked Storage System I/P Addressing Scheme on page 56 for information on determining cluster ID.

8. When you have entered each variable, verify they are correct,

   e.g. enter `set boot addr`. The prompt should return:

   PMON> `bootaddr = 10.xx.y.5`

9. Reboot the Server.

10. At the PMON> prompt, enter the following:

    `netboot -o 100000 10.xx.y.5:vg4install.kdi;g -e 104020.`

For example, if the server node was node 1 in cluster 1, the address would be 10.64.1.5 (this is the address the server will use to reach the TFTP server on the MSi PC).

Entering this command will execute the Kernel download from the TFTP server. If the following error appears, recheck your TFTP settings (step 4. on page 200).

"Cannot get kdi file from the host IP ###.###.###.###"

Wait for the prompt:

```
Install upgrade now ('no' => exit)?  (y/n; def=y):
```

11. At this point, insert the current server software CD in the MSI PC CDROM drive. Follow the dialog on the MSi PC to execute the FTP transfer of data to the Server Node. If you encounter difficulties, contact Avid MediaStream SupportSystems MediaStream Support.

12. Enter y.

Install upgrade now ('no' => exit)? (y/n; def=y):y

The upgrade begins. This may take a few minutes.

13. When prompted with the following, enter y:

```
 Is it ok to reboot the OS off the new disk kernel?  (y/n; def=y):
```

The system completes a reboot off the disk drive.

14. When the system has completed reboot, logon as **root**.

15. Restore Sitefiles (see *Restore the Site Files on page 198*).

16. When Sitefiles have been restored run **startams** to complete the reboot of the server node.

PMON Upgrade

The PMON bootrom monitor of the system controller board may require field upgrade. If this procedure is called out in the software install guide for a particular release, then you will use the MSi TFTP server to accomplish this. To perform the PMON upgrade:

1. On the MSI, start the Avid MediaStream Support TFTP application by double clicking the Avid MediaStream Support TFTP Server icon (on the MSi desktop). The Avid MediaStream Support. TFTP Server application will display the MSI PC name and prompt you to enter the node name or IP address of the server node in question.

2. Enter the IP address or the hostname of the server node.

3. Power on the server node, and press ESC when the following prompt appears:

```
Autoboot command: "diskboot -x -d /dev/sd0 -o100 -l5000 -a100000 -- a;g
1000"

Press <Enter> to execute or any other key to abort.Restore the server's
 as described below.
```

4. Verify that the four bootrom monitor variables are set as shown below:

Enter **set bootaddr**

The boot address is the IP address for the TFTP server. This server runs on the MSi PC. The correct address is the VLAN address for connection between the Server Node and the MSi PC. This command should return the following:

PMON> bootaddr = 10.xx.y.5 (where xx equals cluster ID and y equals server ID).

If the value is incorrect, enter **set bootaddr 10.xx.y.5** (where xx equals cluster ID and y equals server ID).

Enter set ipaddr

The IP address is the LAN address for the server node. This command returns the following:

PMON> ipaddr = 10.xx.y.3 (where xx equals cluster ID and y equals server ID).

If the value is incorrect, enter the correct value i.e. s**et ipaddr 10.xx.y.3**

Enter **set gateway**

The Gateway is the IP address for the external router connection. This command returns the following:

PMON> gateway = 10.xx.y.32 (where xx equals cluster ID and y equals server ID).

If the value is incorrect, enter the correct value.

Enter **set netmask**

The netmask for MSS Networked storage systems should always be set as follows:

PMON> netmask = 255.255.255.0

📄 *See Networked Storage System I/P Addressing Scheme on page 56 for information on determining cluster ID.*

5. If any of the return variables are incorrect, enter the command followed the correct variable.

6. If variables have been changed, enter **reboot**, and press ESC when the following prompt appears:

```
Autoboot command: "diskboot -x -d /dev/sd0 -o100 -15000 -a100000 -- a;g -e
Press <Enter> to execute or any other key to abort.
```

7. On the MSi, verify that the TFTP server (PumpKIN) is setup correctly (see TFTP Startup on page 199).

8. Set TFTP filesystem root (download path) to D:\kdi directory. This is the directory in which the needed PMON file is located on the installation CD.

📄 *If you haven't already done so, insert the installation CD in the MSi PC, and exit the installation prompt when it appears.*

9. At the PMON> prompt, enter **set sbsexpert 1**.

10. Enter **netboot -f fff00000 -o 10000 pmon122vg4.elf**

This will begin the TFTP transfer and flash of the PMON. When complete you will see the following:

```
[DISKROOT] Install the ram kdi into flash memory.
    cd /
    Flash program /usr/local/bin/flash exists, let's go on.
    Evaluating flash kdi revision info:
        9400320 = Size of /vg4install.bin, in decimal bytes
            1.5 = New /vg4install.bin revision
            1.5 = Current Flashed /vg4install.bin revision
    New kdi (1.5) and flash kdi (1.5) are the same, no reflash required
```

11. At the prompt, enter unset **sbsexpert**.

12. Enter **reboot**. This activates the newly loaded changes.

13. Start up the server and allow it to start normally.

14. If the server doesn't autoboot, at the PMON> prompt, enter:

diskboot -x -d/dev/sd0 -o100 -15000 -a100000 --a;g -e 100020

15. When the system has completed reboot press ESC at the following prompt:

```
Waiting 00:40 to start the MSS storage controller:
- Press <return> to start the MSS Server immediately.
- Press ESCAPE to end the timeout and bypass the MSS server startup.
{ 0:40} Waiting to start MSS Server.  (<Enter>=StartNow or <ESC>=DoNotS
```

16. Logon as root and enter the following command:

    ```
    installbvs -c
    ```

17. When the prompt returns, the process is complete. Restart the server by entering **stopams.**

Replacing or Adding Decoder/Encoder Boards

You may add decoder and/or encoder channels in any server to a maximum of 12 channels. Multiple types of decoders can be configured in individual servers.

The following table shows the part numbers and the MediaStream Server (MSS) system software version associated with the Rev 3 decoder/encoder boards.

If you exchanged a board, your part number becomes the Exchange Part Number for the original board as shown in the table.

Avid MediaStream Avid MediaStream SupportI/O Board Part Numbers and Software Version

Board Part No.	Description	Exchange Part No.	MSS Version	Network Storage System Version
37N21A000	Dual Decoder	37N200321	B.09.30	C.15.72
37N21B000	Dual Decoder w/SMPTE-356M	37N200353	B.09.40	C.16.00
37N20D001	Single Channel SD Encoder	37N200138	B.09.40	C.16.00
37N20E001	Dual Channel SD Encoder	37N200139	B.09.40	C.16.00
37N20E100	SD Encoder/SD Decoder	37N2000354	B.09.40	C.16.00

* The Exchange Part No. is the replacement board part number. Use this number if you have replaced the original board.

If you upgrade your board, you may need to upgrade your MediaStream Server (MSS) software to the supported software version.

As of the 37N914XXX series, the boards do not have an internal termination for Genlock, so an external terminator is required.

> *If you install a loop-through cable that is not connected at the other end, the Genlock will not be terminated.*

Identifying a Faulty Decoder

Determining whether a decoder has failed can be a difficult task. You will need to troubleshoot error log files, run diagnostic programs, and check hardware and software configurations. Making the determination may require Avid MediaStream Support assistance.

After a faulty decoder has isolated, you need to identify the decoder. Enter `vmescan -d` to display a list of the decoders and their hardware addresses. At the back of the board, an LED displays the board's port address, for example, DEC 1. Decoder 1 occupies port ID 0 on the VME bus. For dual decoder boards, the display alternates between the two decoder port addresses.

Removing a Decoder

Before removing a decoder board, shut down the server and turn off the power.

To remove the board:

1. Disconnect any audio and video cables that are attached to the board and any other cables that may prevent removal of the board from the card cage.

2. Loosen the two captive screws (one at each end of the board) that secure the board in the cage.

3. If a blanking panel is installed below or above the decoder board, remove it. If another board is installed in this position, loosen its retaining screws. Use the ejection levers to pull the board about 1 inch out of the card cage.

4. Use the ejection levers to pull the board loose from its connectors, then gently remove the board from the server.

5. Set the dip switches on the replacement decoder to the appropriate port number. Dual decoders have two sets of dip switches (see Figures 9-13 and 9-14 for correct decoder settings).

6. Insert the new decoder in the VME chassis. Make sure the board is firmly seated in the chassis before screwing it down.

7. Once the new board has been installed, and all of the cables reconnected, turn on the server and ensure that the software loads properly.

8. If there are problems with the software, or the decoder does not operate correctly:

Enter `vmescan -d` to display a list of the decoders in the server. If the new decoder is not displayed in the list, shut down and turn off the server and remove the board. Check the address switches to verify the correct settings. Reseat the board and restart the server. If there still are problems, call Avid MediaStream Support.

Adding a New Decoder

Setting the Address

There are two sets of dip switches (one for each channel) on each board. With dual decoder boards, both the *primary* and *secondary* address switches must be set. On single channel boards, only the primary switch must be set. The switches are mounted towards the back of the board as shown in .

Decoder Dip Switches
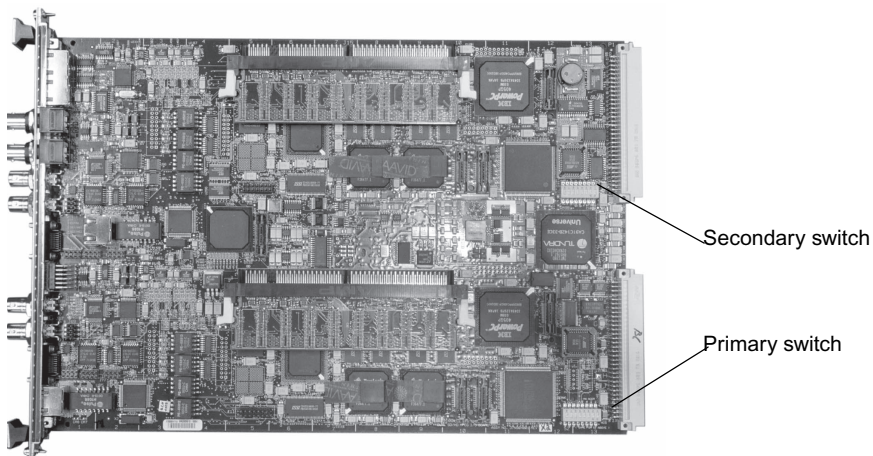
Dip Switch Settings

shows the dip switch settings for the decoder board. Each dip switch has eight micro switches that need to be set for board configuration. To set the board correctly, view it with bit 8 on the left and bit 1 on the right as shown. The bits are numbered from 8 to 1 (1 is the Least Significant Bit).

- Set bits 7-5 to the correct Device ID .

- Bits 4-1 are set in binary.

- Set channel 1 to address 0000, and number sequentially from there for each channel to a maximum of 1111.

- For dual boards, the hardware address for the *primary* and *secondary* switches must be unique.

Dip Switch Settings

Device ID
110 = SD
100 = HD
001 = HD & MPEG IN
010 = MPEG OUT

Device ID

Debug
Leave At "0"
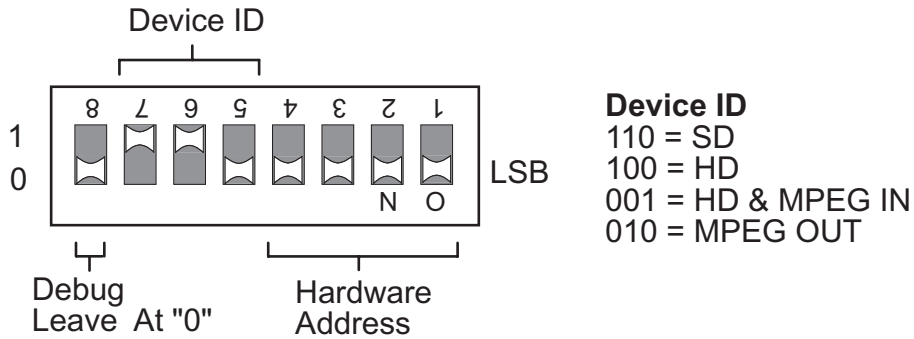
Hardware
Address

Note: White is switch position in this case white is down or 0

Setting the Hardware Address

Before you can install a new decoder board in the server, you must set its hardware address. The MediaStream software relies on a unique address for each channel.

The dual decoder boards represent two channels and require two addresses. The MediaStream software will recognize one board as two separate decoders.

To determine the right address:

1. Start a telnet session for the server in which you plan to install the board.

2. Enter **vmescan -d** to view a list of all the installed decoders and their addresses. Select two unused addresses for the new Card.

   In the example below, the positions 0 and 1 (Decoder 1 and Decoder 2) are taken. Subsequent addresses up to Decoder 16 are available.

```
[root@08 /bvs/tmp] vmescan -d
Indx Type <-- Address Range --> <Queried> <Conclusion>
32 Decoder 0x80000000 0x83FFFFFFF 0x00000000 4:2:2 EA decoder
FOUND at -d 0
33 Decoder 0x84000000 0x87FFFFFFF 0x00000000 4:2:2 EA decoder
FOUND at -d 1
34 Decoder 0x88000000 0x8BFFFFFFF 0x00000000 No board found.
35 Decoder 0x8C000000 0x8FFFFFFFF 0x00000000 No board found.
36 Decoder 0x90000000 0x93FFFFFFF 0x00000000 No board found.

45 Decoder 0xB4000000 0XB7FFFFFFF 0xffffffff No board found.
46 Decoder 0xB8000000 0xBBFFFFFFF 0xffffffff No board found.
```

Installing a Decoder Board

Always shut down the server before installing a decoder board.

To shut down the server:

1. Start the MSi application. From the System Administration window, open a telnet session and enter the command **stopams -H.**

2. When this message is displayed, turn off the power switches on the back of the server:

   Halting (in tight loop) -OK to Hit Reset Button

To install the board:

1. Move or disconnect any cables that might interfere.

2. Select an unused slot in the server, and remove the screws and cover plate.

3. Carefully, slide the new decoder board into the slot.

4. Press the board firmly to seat it into the connectors at the rear of the frame. The front panel should be flush with the other boards in the server.

5. Tighten the attached retaining screws.

6. Attach your video output cables.

7. Attach your audio output cables.

8. Attach your Genlock cables, if required.

If the Genlock signal terminates at a dual decoder board, you do not need to attach a terminator as the board is internally terminated. However, it there are more boards connected to the Genlock Loop, install a terminator on the last one.

The HD Input board requires no Genlock.

9. Use two RJ-45 to RS-422 adapters and the RS-422 control cable to provide connections from the station's automation to the RJ-45 connectors on the board. Use one connector on Port A for connection to a single port. For dual ports, use both Port A and Port B connectors

LAN-to-RS-422 Adapter
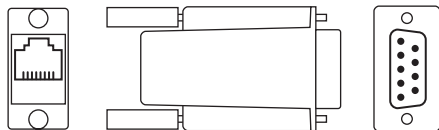
10. Reconnect any cables you removed during dual decoder board installation.

11. Turn the power switches back on.

12. Monitor the server's boot process from the MSi's System Administration window. When this message appears, press the Esc before the AMS application starts:

```
Waiting 00:40 to start the MSS storage controller:

- Press <return> to start the MSS Server immediately.
```

Software Configuration

In order for the new boards to boot up correctly and be available for use, you need to configure the bvsrc file on the server using the edit_bvsrc command.

Run vmescan

Before configuring the decoder boards, verify that the new boards are available to the system and that the dip switches are set correctly. To do this, run the vmescan command with the decoder flag (`vmescan -d`), which reports all available decoders on the VME bus.

An example of the output from the command follows. The output addresses start at 0. The system found six dual decoder boards configured at hardware ID's 0-11.

```
[root@08 /bvs/tmp] vmescan -d

Indx Type    <-- Address Range --> <Queried>  <Conclusion>
32   Decoder 0x80000000 0x83FFFFFF 0x00000000 dual SD decoder r1 (P) FOUND at -

33   Decoder 0x84000000 0x87FFFFFF 0x00000000 dual SD decoder r1 (S) FOUND at -

34   Decoder 0x88000000 0x8BFFFFFF 0x00000000 dual SD decoder r1 (P) FOUND at -

35   Decoder 0x8C000000 0x8FFFFFFF 0x00000000 dual SD decoder r1 (S) FOUND at -

36   Decoder 0x90000000 0x93FFFFFF 0x00000000 dual SD decoder r1 (P) FOUND at -

37   Decoder 0x94000000 0x97FFFFFF 0x00000000 dual SD decoder r1 (S) FOUND at -

38   Decoder 0x98000000 0x9BFFFFFF 0x00000000 dual SD decoder r2 (P) FOUND at -

39   Decoder 0x9C000000 0x9FFFFFFF 0x00000000 dual SD decoder r2 (S) FOUND at -

40   Decoder 0xA0000000 0xA3FFFFFF 0x00000000 dual SD decoder r2 (P) FOUND at -
```

Check that the board you inserted shows up correctly addressed. If the board does not appear in the list, run vmescan without a command flag to find out if the board shows up as an "unknown" board.

If the board shows up as unknown or without the correct ID, shut down and turn off the server. Remove the board and reset the dip switches to the correct ID. If the board does not appear in the list, shut down the server and reseat the board. In all cases, restart the server and re-run vmescan. Call Avid MediaStream Support if you still cannot detect the board with the correct ID.

Run edit_bvsrc

When the boards have been correctly identified with vmescan, run edit_bvsrc from /bvs. This command begins an interactive script that will result in a correctly configured bvsrc file. Follow the instructions on the screen to complete this procedure. The bvsrc file is required to correctly initialize the new boards so they will be available to the system.

When the script has finished, verify the output. To do this, navigate to /bvs and enter vi bvsrc. If the files are incorrect, manually edit them in *vi*. Consult Avid MediaStream Support if you have questions regarding the proper input for the bvsrc file.

Example Lines in the bvsrc File

The following are examples of the output you should see in the bvsrc file for dual SD Decoders, dual HD Decoders, and HD Input Cards. The data fields that change can be seen under the headings of *Decoder/Encoder Model+Rev* and *Video Decoder/Encoder Firmware File*.

> **Note:** The HD Input board will appear in the Encoder section of the file, while all decoders will appear in the section reserved for decoders.

Hardware address (set with the dip switch) appear under the heading *Decoder/Encoder HW Addr*. The first address is 0, there can be a maximum of 12 total input/output (encoder/decoder) ports per MSS 8000.

Dual SD Decoder

#	BVScpu	Decoder	Decoder	Video Decoder	Hardware	Vide
# Type	name	HW Addr	Model+Rev	Firmware File	Cfg File	P.Nu
VIDEO_OUT:	hpmss001	0	"dual SD decoder"	"hd_code"	"/dev/null"	1
VIDEO_OUT:	hpmss001	1	"dual SD decoder"	"hd_code"	"/dev/null"	2

Decoder HD Decoder

#	BVScpu	Decoder	Decoder	Video Decoder	Hardware	Vide
# Type	name	HW Addr	Model+Rev	Firmware File	Cfg File	P.Nu
VIDEO_OUT:	hpmss001	0	"HD decoder"	"hd_code"	"/dev/null"	1

MPEG Output

#	BVScpu	Decoder	Decoder	Video Decoder	Hardware	Vide
# Type	name	HW Addr	Model+Rev	Firmware File	Cfg File	P.Nu
VIDEO_IN: hpmss001		0	"MPEG out"	"mpi_code"	"/dev/null"	1
VIDEO_IN: hpmss001		0	"MPEG out"	"mpi_code"	"/dev/null"	2

HD or MPEG Input Card

#	BVScpu	Encoder	Encoder	Video Encoder	Hardware	Vide
# Type	name	HW Addr	Model+Rev	Firmware File	Cfg File	P.Nu
VIDEO_IN: hpmss001		0	"MPEG in"	"mpi_code"	"/dev/null"	-1
VIDEO_IN: hpmss002		1	"MPEG in"	"mpi_code"	"/dev/null"	-2

When the bvsrc file has been appropriately edited, run **startams** to start the server. When the server has successfully booted, the card installation is complete.

Configure MSi to Include New Channels

When the server has successfully started, open the MSi application.

Configuration Dialog
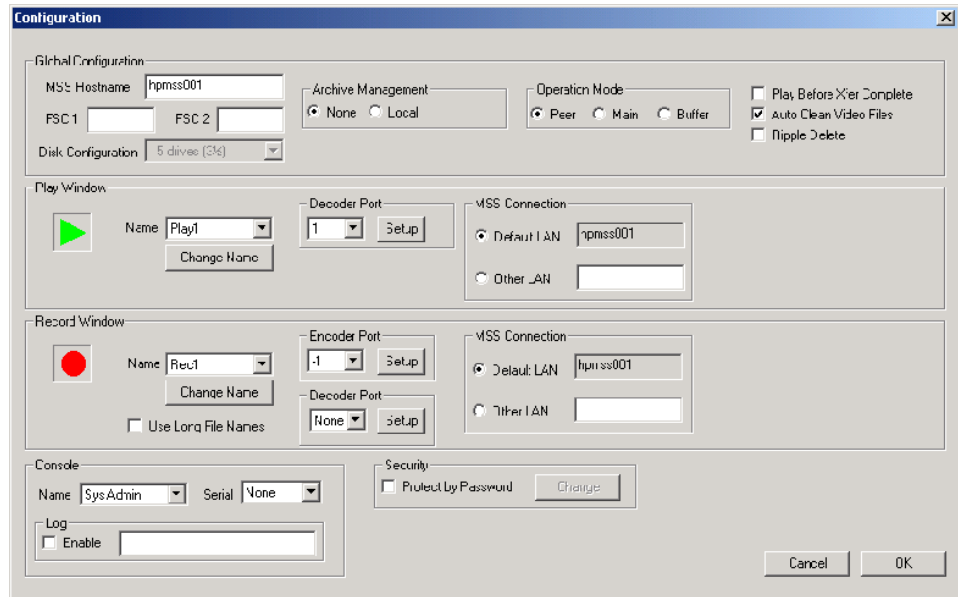
1. Select Setup > Configuration. The Configuration dialog box appears.

2. In the Play Window pane of the Configuration dialog box, select a Play button from the Name menu.

3. Select a Decoder Port for each channel you have added and click the Setup button to define the settings for the port.

4. Click OK. When you exit the Configuration dialog box, there should be new Play buttons on the MSi window for each channel you added.

5. Click one of the new Play buttons and play a clip to confirm the board operates correctly.

Identifying a Faulty Encoder

The MSS 8000 has encoder boards installed from the top slot down in the chassis with Encoder number 1 usually as the top encoder board, although encoder boards can be installed in any order. The only way to confirm that the correct board is being replaced is to check the dip switches on the board.

Removing and Replacing an Encoder

Prior to removing an encoder board, the server must be shutdown and turned off. To remove the board:

1. Disconnect any audio and video cables attached to the board and any other cables that may prevent removal of the board from the card cage.

2. Loosen the captive screws that secure the board in the cage.

3. If a blanking panel is installed below or to the right of the encoder board, remove it.If another board is installed in this position, loosen its retaining screws. Use the ejection levers to pull the board about 1 inch out of the card cage.

4. Use the ejection levers to pull the board loose from its connectors then gently remove the board from the server.

5. Encoder replacement is the reverse of the removal process. Insert the board firmly into the card cage.

6. Once the new board has been installed and all of the cables have been reconnected, turn on the server and ensure that the software startup process completes without errors.

7. If the startup process has errors or the encoder does not operate correctly:

8. Enter vmescan -e to display a list of the encoders in the server. If the new encoder is not displayed in the list, remove the board and check the address switches. Re-fit the board and try the boot up process again. If there still are problems, call Avid MediaStream Support.

```
  [root@01 /bvs] vmescan -e

Indx Type    <-- Address Range --> <Queried>  <Conclusion>

48   Encoder 0xC0000000 0xC3FFFFFF 0x00000000 dual SD enc r3* FOUND at -e 0

Encoder 0xC4000000 0xC7FFFFFF 0xffffffff No board found.
```

Encoder Address Dip Switch Settings

The following figure shows the dip switch settings for the encoder board. Each dip switch has eight micro switches that need to be set for board configuration. To set the board correctly, view it with bit 8 on the left and bit 1 0n the right, as shown in the diagram. The bits are numbered from 8 to 1(1 is the Least Significant Bit).

1. Set bits 8-5 to 1001 for the Device ID setting.

2. Set Bits 4-1 according to the binary address for each encoder, ranging from hardware address 0000 for "port 0" Encoder 1 up to address 1111 for "port 15" Encoder 16.

Encoder Dip Switch Settings

Device ID
0110 = SD Decoder
0100 = HD Decoder
0001 = HD & MPEG IN
0010 = MPEG OUT
1001 = SD Encoder
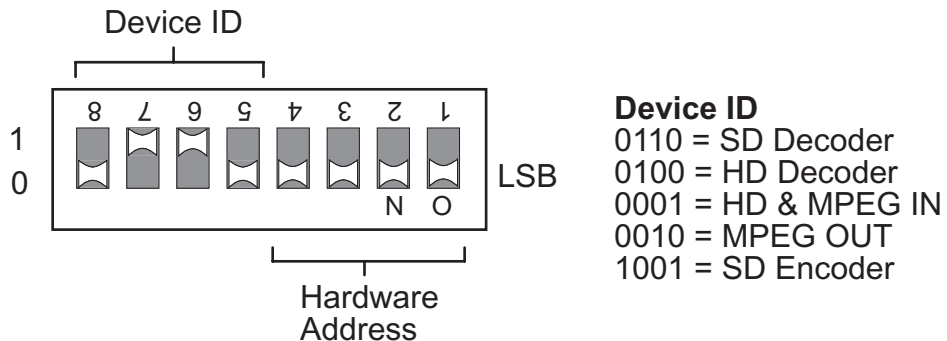
Note: White is switch position in this case white is down or 0

📖 *Although hardware address 15 is "legal," no more than 12 total input/output channels are allowed on a single MSS 8000. Typically, encoders are sequenced in order from port 0 to the last configured encoder on the server.*

Encoder Dip Switch Location

The following figure shows the location of the encoder dip switches.

Encoder Dip Switch Location

Secondary switch

Primary switch
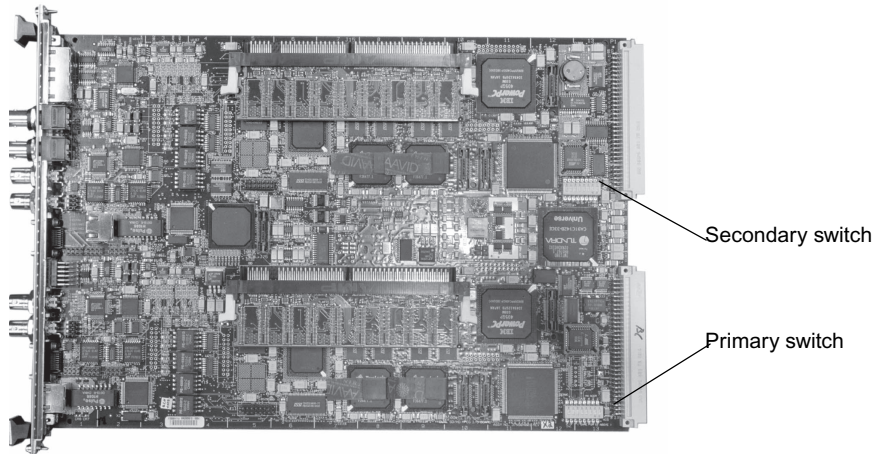
Adding Encoder Boards

Before you can install a new encoder board, you must set its hardware address.

To determine the right address:

1. Start a telnet session for the server in which you plan to install the board.

2. Enter vmescan -e to display a list of all the installed encoders and their addresses. Select two unused addresses for the new board.

```
 [root@1401 /bvs] vmescan -e
Indx Type    <-- Address Range --> <Queried>  <Conclusion>
48   Encoder 0xC0000000 0xC3FFFFFF 0x00000000 dual SD enc r3* FOUND at -e 1
49   Encoder 0xC4000000 0xC7FFFFFF 0xffffffff No board found.
50   Encoder 0xC8000000 0xCBFFFFFF 0xffffffff No board found.
51   Encoder 0xCC000000 0xCFFFFFFF 0xffffffff No board found.
52   Encoder 0xD0000000 0xD3FFFFFF 0xffffffff No board found.
53   Encoder 0xD4000000 0xD7FFFFFF 0xffffffff No board found.
54   Encoder 0xD8000000 0xDBFFFFFF 0xffffffff No board found.
```

In this example, position 0 (Encoder 1) is taken. All addresses after that, to Encoder 16, are available.

Encoder Installation

You must shut down the server before installing an encoder board.

1. Start the MSi application. From the System Administration window, open a telnet session and enter the command **stopams -H.**

2. When this message is displayed, turn off the power switches on the back of the server:

3. **Halting (in tight loop) –OK to Hit Reset Button**.

4. Move or disconnect any cables that might interfere.

5. Select an unused slot in the server and remove its screws and cover plate.

6. Carefully, slide the new encoder board into the slot.

7. Press the board firmly to seat it into the connectors in the rear of the frame. The front panel should be flush with the other boards in the server.

8. Tighten the attached retaining screws.

9. Attach your video Input cable.

10. Attach your audio Input cable.

11. Attach RS-422 cables for Automation.

12. Reconnect any cables you removed during encoder board installation.

13. Turn on the power switches on.

14. Monitor the system startup from the MSi's System Administration window. When this message appears, press the Esc button before the AMS application starts:

```
Waiting 00:40 to start the MSS storage controller:
- Press <return> to start the MSS Server immediately.
- Press ESCAPE to end the timeout and bypass the MSS server startup.
{ 0:40} Waiting to start MSS Server.  (<Enter>=StartNow or <ESC>=DoNotStart)
```

Software Configuration

For the new boards to boot up correctly and be available for use, configure the bvsrc file on the server (using edit_bvsrc). For the server to recognize the latest releases of these boards, the server needs to be running the latest MSS software.

Run vmescan

Before configuring the encoder board(s), verify that the new board(s) are available to the system and that the dip switches are set correctly. To do this, run the command vmescan -e. This command reports all available encoders on the VME bus.

An example of the output from the command follows. The output addresses start at 0. The system found two encoder boards configured at the hardware IDs 0-1.

```
Indx Type    <-- Address Range --> <Queried>  <Conclusion>
48   Encoder 0xC0000000 0xC3FFFFFF 0x00000000 4:2:2 Encoder FOUND at -e 0
Encoder 0xC0000000 0xC3FFFFFF 0x00000000 4:2:2 Encoder FOUND at -e 1
50   Encoder 0xC8000000 0xCBFFFFFF 0xffffffff No board found.
51   Encoder 0xCC000000 0xCFFFFFFF 0xffffffff No board found.
52   Encoder 0xD0000000 0xD3FFFFFF 0xffffffff No board found.
53   Encoder 0xD4000000 0xD7FFFFFF 0xffffffff No board found.
54   Encoder 0xD8000000 0xDBFFFFFF 0xffffffff No board found.
```

Check that the board you inserted in the system shows up correctly addressed. If the board is not listed, run vmescan without the command flag to determine if the board is incorrectly addressed, or listed as an "unknown" board.

If the board shows up as unknown or without the correct ID, shut down and turn off the server. Then, remove the board and reset the dip switches to the correct ID. If the board does not appear in the list, shut down the server and reseat it. In all cases, restart the server and re-run vmescan to see if the board is listed with the correct ID. If there is still a problem, call Avid MediaStream Support.

Run edit_bvsrc

When the boards have been correctly identified with vmescan, run edit_bvsrc from the /bvs directory. This command begins an interactive script that will result in a correctly configured bvsrc file. Follow the instructions on the screen to complete this procedure. The bvsrc file is required to correctly initialize the new boards so they will be available to the system.

When the script has finished, open the bvsrc file in *vi* to verify the output. To do this, go to the directory /bvs and enter vi bvsrc. If the files are incorrect, manually edit them in *vi*. Consult Avid MediaStream Support if you have questions regarding the bvsrc file.

Example Lines in the bvsrc File

The following is an example of the output you should see in the bvsrc file for the 4:2:2 Encoder Board. The data fields that will change are under the headings of *Encoder Model+Rev*, and *Video Encoder Firmware File*.

📖 *The HD Input board will appear in the Encoder section of the file, while all decoders will appear in the section reserved for decoders.*

Hardware address (set with dip switch) will appear under the heading *Encoder HW Addr*. The first address is 0 up to 12 maximum total input/output (Encoder/Decoder) boards per MSS 8000.

```
Indx Type     <-- Address Range --> <Queried>  <Conclusion>
48   Encoder 0xC0000000 0xC3FFFFFF 0x00000000 4:2:2 Encoder FOUND at -e 0
Encoder 0xC0000000 0xC3FFFFFF 0x00000000 4:2:2 Encoder FOUND at -e 1
50   Encoder 0xC8000000 0xCBFFFFFF 0xffffffff No board found.
```

When the bvsrc file has been appropriately edited, run `startams` to start the server. When the server has successfully booted, the board installation is complete.

Server Fan Tray Replacement

The MSS 8000 server node contains two rear-mounted, hot-swappable fan tray modules. If a fan tray fails, the right LED on the front panel will turn red. The server can run safely with one functional fan tray.

MS Server Fan Tray

Fan trays (2)

Retaining screws
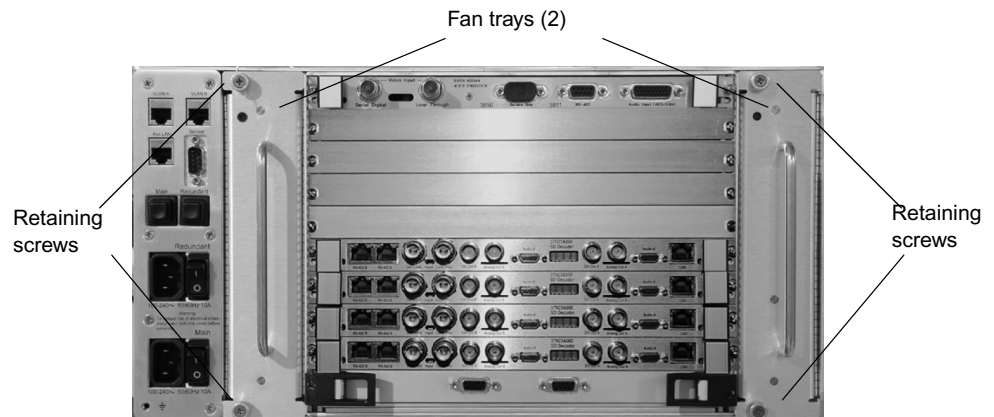
Retaining screws

To replace a fan tray:

1. Ensure you are using an anti-static wrist strap or an anti-static mat.

2. Loosen the two retaining screws securing the fan tray to the chassis.

3. Use the tray handle to slide the tray out of the assembly a few inches.

⚠ **Wait at least   minutes for fans to stop spinning after being disengaged from unit.**

4. Avoid touching any spinning fan blades.

5. Replace the fan tray with the replacement unit and secure the mounting screws.

MS Server Fan Tray Module

Lantronix Module Replacement

The MS server contains a Lantronix module and an internal Ethernet LAN hub mounted on a removable tray on the front right side of the MS server chassis. Lantronix module failure interrupts communications through the server's console port.

To remove for service or replacement:

1. Ensure you are using an anti-static wrist strap or an anti-static mat.
2. Safely shut down and power down the MS server.
3. Firmly grasp the server bezel and remove the front bezel cover.
4. Loosen the four captive screws of the front cover plate.

MS Server Front Plate (with bezel removed)

Retaining screws
of front panel
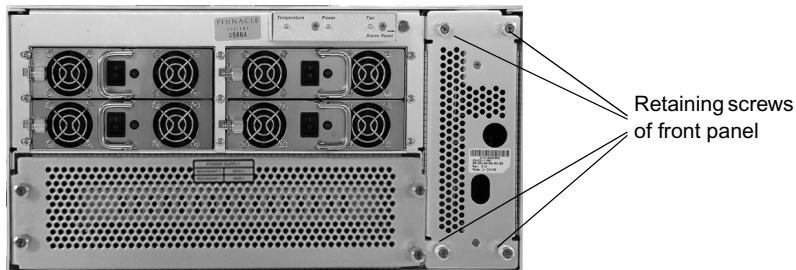
5. Carefully, slid the Lantronix module partially out of the server chassis.

6. Support the Lantronix module and unscrew the three RS-232 cables from the board assembly.

Lantronix Module (Right Side)

RS-232 connectors

Circuit board connectors
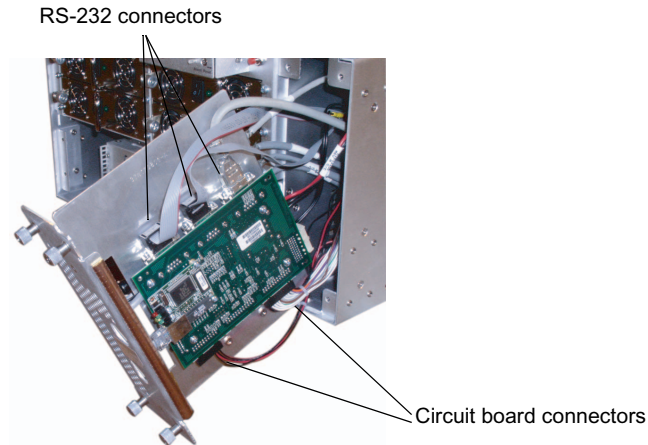
7. Disconnect the two circuit board connectors on the bottom of the board assembly.

8. Disconnect the 5-volt DC power connector from the LAN hub mounted on the opposite side of the Lantronix module (see the following figure).

9. Disconnect the three RJ-45 cable connectors from () the LAN hub (see the following figure).

Lantronix Module (Left Side)

RJ-45 connectors

5V OC Power
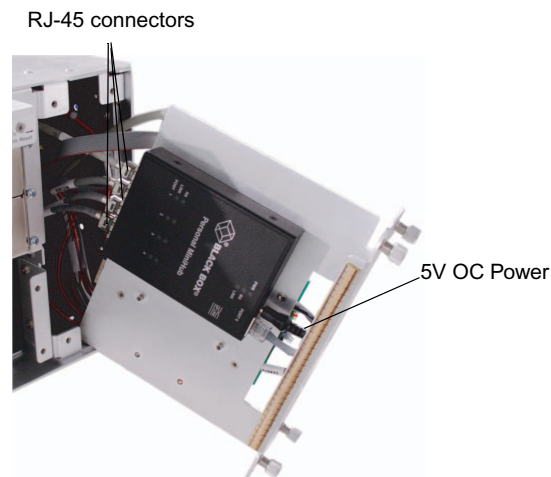
10. Slide the Lantronix module out.

11. Install the replacement module and reconnect the cables in the order you removed them.

Lantronix Setup

After installing the new Lantronix module, it must be configured to allow telnet communication through the console port. The module has a tag on its faceplate containing the Lantronix MAC address a 12-digit Hexidecimal number (see the following figure). You need to use this number for the unit's configuration.

MAC Address Location

Lantronix module
MAC address
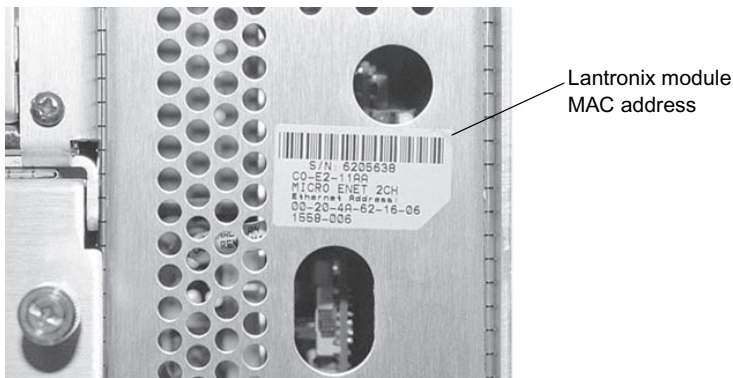
To configure the module:

1. Power up the MS server and let it boot up.

2. On the MSi PC, double-click the MediaStream Console Setup icon. The Console Setup dialog box opens.

3. Enter the 12-digit MAC address number into the MAC Address data field. Separate each two-digit number with a hyphen (-).

Console Setup Tool Dialog
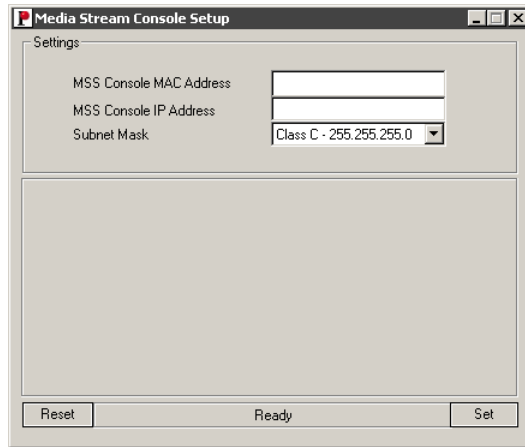
4. Enter the correct LAN address in the IP Address field. The address should be as follows:

    `10.XX.YY.4` where `<XX>` equals cluster subnet and `<YY>` equals server node.

    For example, 10.64.1.4 is the console address for server node 1 in cluster 1 (see VLAN Topology on page 51).

5. The subnet mask should be Class C – 255.255.255.0. If all entries are correct, press Set.

6. The dialog box shows the progress of the setup. If successful, *Setup successfully finished* displays at the bottom of the window.

7. Close the dialog box. Setup is complete.

Lantronix Troubleshooting

If the Console Tool fails to set up the Lantronix module correctly, you may have to perform a manual setup. Manual configuration requires There are two options to manually configure the Lantronix module, one is to log on to the unit via Telnet or connect the unit with a 9-pin null-modem cable and the other is to log on via Hyperterminal.

Telnet Logon

Logon procedures are slightly different for system operating on Windows 2000 and Windows NT. If you are using a third-party program, follow its instructions. Open a telnet session without specifying the hostname or IP address. Specify the port as 9999. This will log on to the Lantronix transceiver rather than the MSS 8000 console port.

Note: Telnet logon cannot be used when installing a new Lantronix module.

To open a telnet session from systems using Windows 2000:

1. From the Start menu, select Run and enter `telnet` in the dialog. Press OK.

Run Telnet Dialog
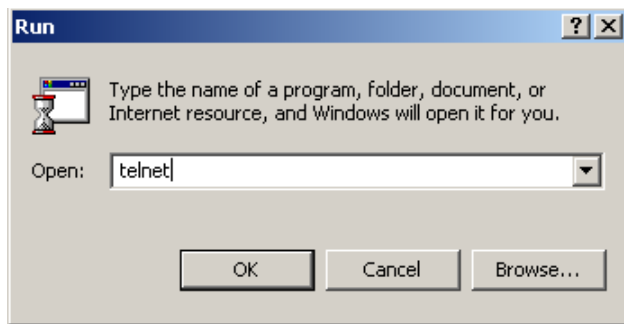
2. At the prompt enter the following:

   `open <hostname> or <IP address> <port ID>`

   For example, `con0101` or `10.64.1.4` followed by 9999 for port ID

The Lantronix session opens with the following display:

```
*** Lantronix Universal Device Server ***
Serial Number 5223866  MAC address 00:20:4A:52:5D:3A
Software Version V04.2 (000908)

Press Enter to go into Setup Mode
```

3. Press Enter. The following text displays:

```
*** basic parameters
Hardware: Ethernet Autodetect
IP addr 010.073.001.004, no gateway set,netmask 255.255.255.000

***************** Channel 1 *****************
Baudrate 9600, I/F Mode 4C, Flow 00
Port 00023
Remote IP Adr: --- none ---, Port 00000
Connect Mode: C0  Disconn Mode: 40  Disconn Time: 30:00
Flush   Mode: 00
Terminal name:

***************** Channel 2 *****************
Baudrate 9600, I/F Mode 4C, Flow 00
Port 10002
Remote IP Adr: --- none ---, Port 00000
Connect Mode: C0  Disconn Mode: 00
Flush   Mode: 00


Change Setup  : 0 Server configuration
                1 Channel 1 configuration
                2 Channel 2 configuration
7 Factory defaults
8 Exit without save
9 Save and exit                Your choice ? 0
```

4. Press 0 to enter Server Configuration.

HyperTerminal Logon

If you do not know the IP address of the Lantronix unit (this may be the case if the unit is a replacement), you can also log on via Hyperterminal to obtain the IP address. Attach a cable between the Lantronix module and the MSi PC using a male to female 9-pin null-modem cable or a female-to-female cable with a male pass-through gender changer.

To connect the Lantronix module and the MSi PC:

1. Ensure you are using an anti-static wrist strap or an anti-static mat.

2. With the MSS 8000 running, unscrew the four retaining screws on the Lantronix module and carefully slide the unit out, taking care not to crimp or unplug attached cables.

3. Carefully remove the center RS-232 cable on the right side of the Lantronix module interface board (see the following figure).

4. Attach the male side of the cable or the male gender changer to the center connector on the interface board.

5. Attach the female side of the cable to the COM 1 port of the MSi PC.

Serial Connection to Lantronix Unit

Remove the center RS-232 connector   Attach cable to the module
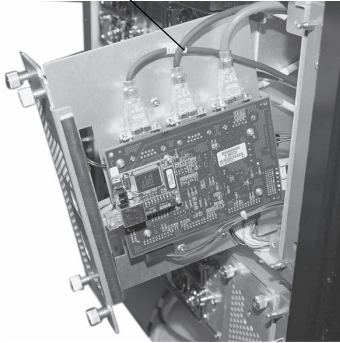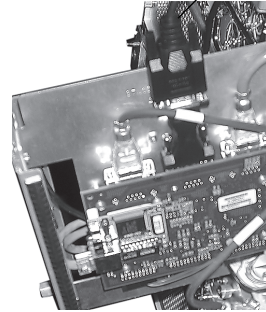
Attach RS-232 cable to serial port on MSi PC

To start Hyperterminal:

1. On the PC, open the Hyperterminal program. Go to Start > Programs Accessories > Communication > Hyperterminal.

2. The Connection Description dialog box displays. Enter a value for the Name, and click OK.

3. Select COM1 in the Connect To dialog box.

4. Enter the values in the COM1 Properties dialog box and click OK.

COM1 Properties
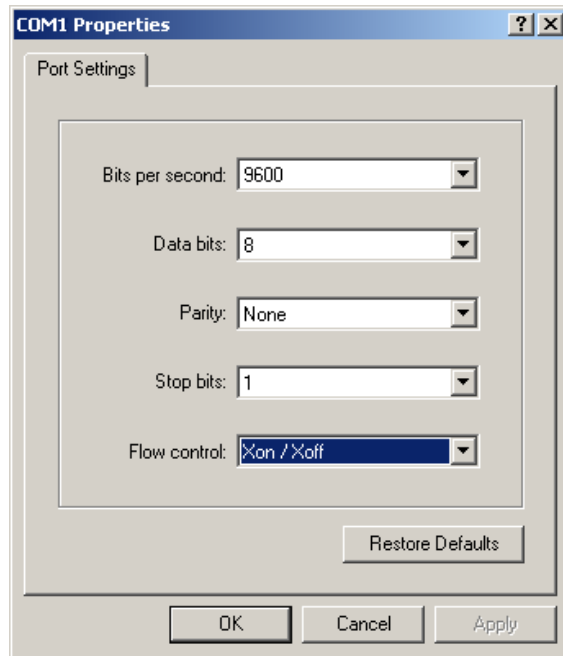
5. To log on to the Lantronix unit, press the reset button on the interface board. You will next use the keyboard. Count to three by one thousands (1001, 1002, 1003) and then press three lower-case *x* characters (xxx) followed by pressing Enter.

Lantronix Reset Switch
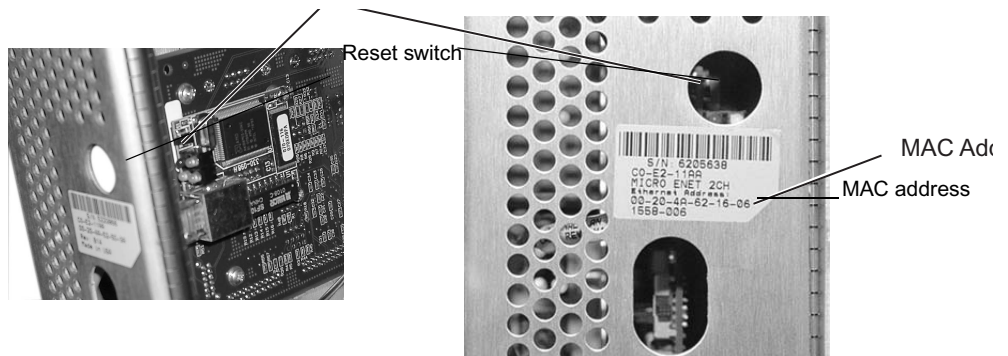
You may have to repeat this procedure. The timing needs to be right in order to access the Lantronix command-line interface.

When you have successfully logged on, the Hyperterminal session will display the Lantronix interface:

```
*** Lantronix Universal Device Server ***
Serial Number 5223866  MAC address 00:20:4A:52:5D:3A
Software Version V04.2 (000908)

Press Enter to go into Setup Mode

*** basic parameters
Hardware: Ethernet Autodetect
IP addr 010.073.001.004, no gateway set,netmask 255.255.255.000

**************** Channel 1 *****************
Baudrate 9600, I/F Mode 4C, Flow 00
Port 00023
Remote IP Adr: --- none ---, Port 00000
Connect Mode: C0  Disconn Mode: 40  Disconn Time: 30:00
Flush   Mode: 00
Terminal name:

**************** Channel 2 *****************
Baudrate 9600, I/F Mode 4C, Flow 00
Port 10002
Remote IP Adr: --- none ---, Port 00000
Connect Mode: C0  Disconn Mode: 00
Flush   Mode: 00


Change Setup  : 0 Server configuration
```

6. Select 0 to enter the Lantronix configuration.

You must enter 0 quickly or else the session will lock up and you will have to repeat Step 4.

Manual Configuration of the Lantronix

If the Lantronix failed to setup successfully with the Serial tool, the most likely problem is that the configuration tool encountered another IP address in a different subnet. The easiest way to correct this is to zero out the Lantronix LAN address in Setup and then run the tool again.This procedure is the same whether you are running it from Telnet or with Hyperterminal. When resetting with a Hyperterminal, you need to reconnect the cables before proceeding with the Serial Tool.

To zero out the LAN address:

1. Go into Lantronix (Server) Setup by selecting 0 at the prompt following logon.

2. The first Byte group will appear on the display in parenthesis. Enter 0 0 0 after each LAN Byte group appears. Then press Enter after each default entry choice.

3. When the display menu choices appear again, enter 9 to save the changes and exit.

4. If performing via Hyperterminal, reconnect the MSS - Lantronix connections. Then, run the Console Tool again.

```
Change Setup  : 0 Server configuration
                1 Channel 1 configuration
                2 Channel 2 configuration
                7 Factory defaults
                8 Exit without save
                9 Save and exit            Your choice ? 0
IP Address : (010) 000.(000) 000.(000) 000.(000) 000
Set Gateway IP Address (N) N
Netmask: Number of Bits for Host Part (0=default) (08)
Change telnet config password (N) N

Change Setup  : 0 Server configuration
                1 Channel 1 configuration
                2 Channel 2 configuration
```

If you still have trouble setting up the Lantronix unit, contact Avid MediaStream Support.

Verifying CPU I/O Connections

SCSI, Ethernet and RS-232 connections to the System Controller card are made via a CPU I/O connection card that is attached to the VME bus under the Boot Drive tray. Loose connections to this card will interrupt RS-232 Console connections to the System Controller and/or Ethernet connections. If the SCSI connection is loose, the server will fail to boot.

If you are having interconnection problems, and you have verified Lantronix and/or Boot drive connections, remove the card, verify connections and re-connect the card.

The card is mounted on the VME backplane under the Boot Drive Tray.

You may have to remove a card securing plate to access the card. There are no active components on this card so card failure is unlikely.

CPU I/O Connections

CPU I/O Card
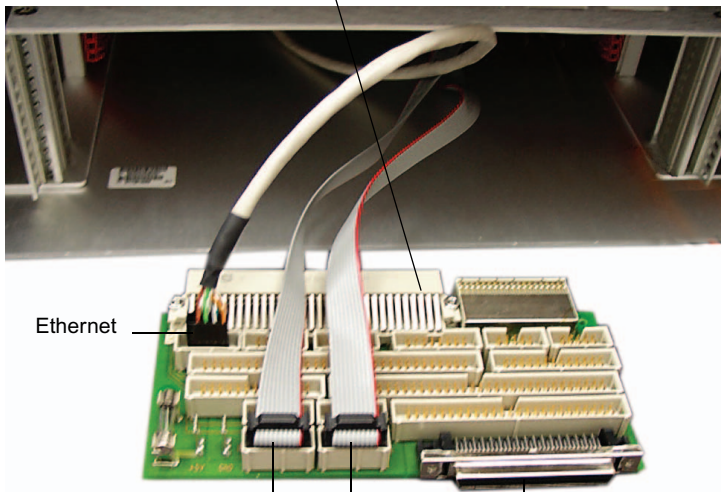
Ethernet

RS-232 1
(marked)   RS-232 1   SCSI

CPU I/O SCSI Connection
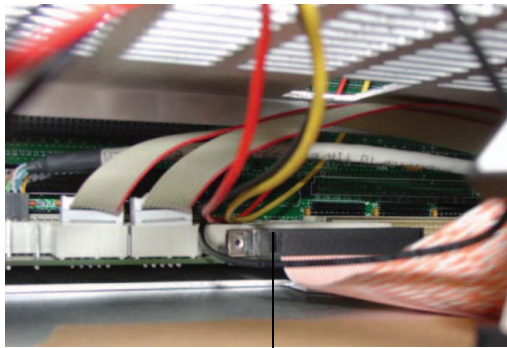
SCSI connection

The 22 inch SCSI cable is mounted on the SCSI connector. The cable faces downward.

Server Power Supply Replacement

The MSS 8000 server node contains four front-mounted, hot-swappable power supply modules. With the front bezel removed, power modules are easily accessible. If a power supply fails, an audible alarm triggers and the center LED on the front panel turns red. Pressing the Alarm Reset button turns off the alarm. The following figure outlines a single MS power supply. The MSS 8000 can run safely with any two power supplies running.

MS Single Power Supply
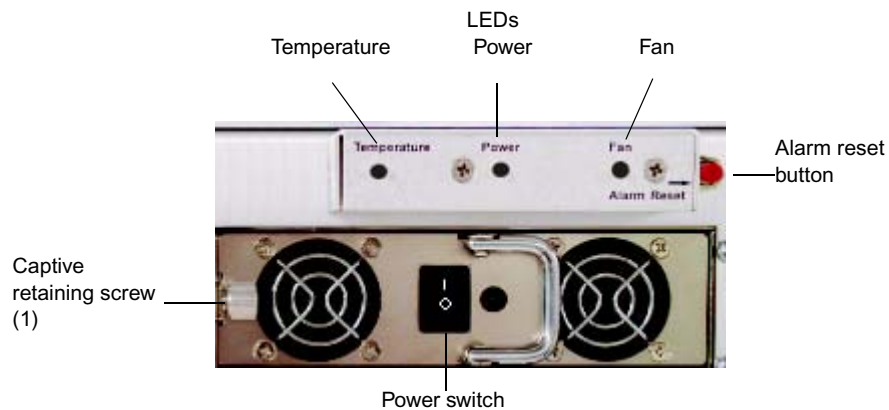
To replace a power supply:

1. Ensure you are using an anti-static wrist strap or an anti-static mat.

2. Loosen the retaining screw securing the power supply to the chassis.

3. Grasp the front handle and pull the power supply from the chassis.

4. Install the replacement supply and secure it to the chassis.

MSS Server Power Supply Module

Adding a Server Node

The MS Networked Storage System allows for system upgrades without interrupting on-air operations. This includes adding additional MSS 8000 server nodes to the system. This section documents the procedures you must follow to add one or more additional server nodes to your system.

Increasing channel playout capacity with additional server nodes will impact overall system bandwidth. Consult the bandwidth tables in Appendix A or contact Avid MediaStream Support to make sure you have adequate bandwidth for additional channel playout.

Systems configured with the HP2512 12 port VLAN switch are limited to four server nodes. The Capellix 2000C switch will limit total server node and/or array expansion as well. If your switch configuration limits server node expansion, consult your Avid MediaStream Systems sales representative to discuss a switch upgrade for system expansion.

Install the Server Node

Mount your server node and attach all video, audio and system connections. See Preparation and Installation for information on rack mounting and installing the server node. See Connecting System Components for system connection instructions.

Your new server node will come pre-configured from the factory as mss0101 (Server 1 in Cluster 1). Your system will already have a Server 1, which may or may not be in Cluster 1. The new node will need to be configured with the correct server and cluster ID for its position within the system before it is brought up as a member of the Networked Storage System.

Connect RS-232 Cable to Server Node and MSi PC

MSi to MSS 8000 Connection

MSS 8000 RS-232 port

MSi serial port
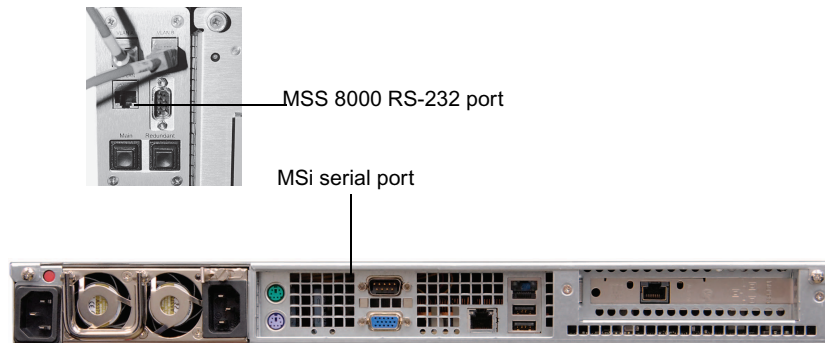
To accomplish initial server node configuration, you will need to physically connect the node to the MSi PC via RS-232. To do this:

1. Attach an RS-232 cable to the 9-pin connector on the upper left rear corner of the MSS 8000.

2. Attach the other end of the cable to the COM2 port on the MSi PC.

3. Flip the bypass switch to the "up" position on the Lantronix module. You can feel the switch by placing your finger in the oval shaped hole on the Lantronix cover plate (see the following figure).

Lantronix Bypass
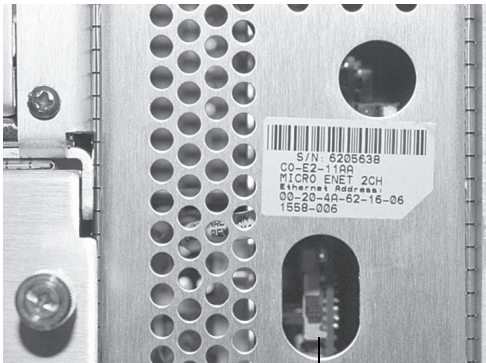
Lantronix bypass switch

Disconnect VLAN Network Connections

The MSS 8000 shipped from the factory will have a hostname ID of mss0101. If your system is already configured for Cluster 1, you will already have a server designated as mss0101. To avoid a network conflict, disconnect the two LAN cables from the back of the server, and leave them disconnected until you have configured your server. You can then reconnect the LAN cables and bring the server into the system.

MSS 8000 LAN Connections

MSS 8000 LAN connections

Start a HyperTerminal Session on the Server Node

1. From the Start menu, go to Start > Programs > Accessories > Hyperterminal > HyperTerminal.

2. The HyperTerminal program will open with a new connection and the Connection Description dialog box. Enter a name for the session, such as *Server*. Then, click OK.

3. In the Connect using: field, select COM2, and click OK.

4. From the COM2 Properties dialog box select the following and click OK:

   - Bits per second: 9600

   - Data bits: 8

   - Parity: None

   - Stop bits: 1

   - Flow control: XONXOFF

5. Click the Properties button, and select the Settings tab on the Server Properties dialog. Select Emulation: VT100, then, click OK

System Controller Board

The MS server contains a system controller board, accessible from the rear of the MS server. If a system controller board fails, remove and replace the system controller board.

⚡ **With the exception of fan trays and power supplies, all boards and components must be removed after the server has been shut down and turned off. Be sure to observe safe practices to avoid damage to sensitive circuits.**

To remove and replace the System Controller board:

1. Ensure you are using an anti-static wrist strap or an anti-static mat

2. Safely turn off the server.

3. Remove fibre channel connections from the system controller board.

System Controller Board Removal

Retaining screws

Latch release button   Latch in open position
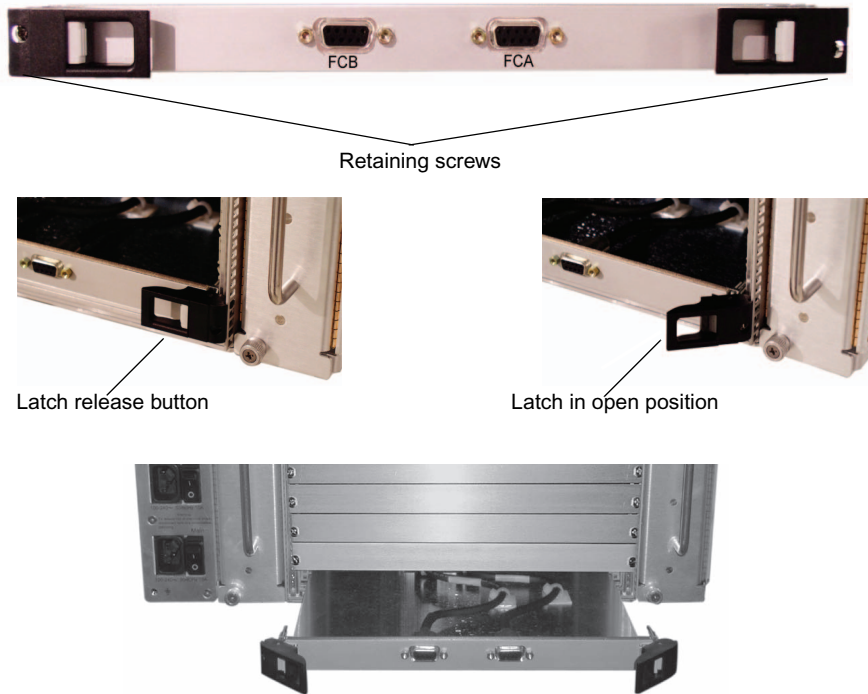
4. Loosen the two retaining screws on the system controller board tray.

5. Press both latch release buttons simultaneously and pull latches open.

⚡ **Lift the board slightly as you remove it, to ensure that none of the components on the underside of the board run into the metal strip across the bottom of the MSS 8000 server chassis.**

6. Carefully slide the system controller board out of the server chassis.

7. Insert the new board, keeping it clear of the bottom strip as cautioned above.

8. Close latches, and tighten retaining screws and reconnect fibre channel cables.

If the system controller board fails, but the boot drive is still functional, continue with the next step.

📖 *Contact Avid MediaStream Support if you need help in determining the status of the boot disk and/or the system controller.*

1. Start up the server. The server displays the following text.

```
        * PMON/2000 Professional *
       Configuration [SBS VG4,EB,NET,SCSI]
      Version: C03 (Avid MediaStream SupportCustom) 1.0 Build 1.21.5.
Nov  5 2003 11:07:47
       This software may be redistributed under the BSD copyright.
       BSP Copyright 2000-2003, SBS Technologies, Inc.
       CPU PowerPC 7410 @ 500 MHz/100 MHz.
```

2. At the prompt, set the four bootrom monitor variables are set as shown below.

   Enter **set bootaddr 10.xx.y.5** (where xx equals cluster ID and y equals server ID).

   Enter **set ipaddr 10.xx.y.3** (where xx equals cluster ID and y equals server ID).

   Enter **set gateway 10.xx.y.32** (where xx equals cluster ID and y equals server ID).

   Enter **set netmask 255.255.255.0**

3. When you have entered each variable, verify they are correct
   e.g. enter set bootaddr. The prompt should return:

   PMON> **bootaddr = 10.xx.y.5**

4. At the PMON> prompt, enter the following command to boot the system off the functioning boot drive:

   diskboot -x -d /dev/sd0 -o100 -l5000 -a100000 -- a;g -e 100020

5. When the system starts, press ESC at the following prompt:

```
{ /-------------------------------------------------------------------
Waiting 00:40 to start the MSS storage controller:
 -  Press <return> to start the MSS server immediately.
 -  Press ESCAPE to end the timeout and bypass the MSS server startup.
[ 0:40]  Waiting to start MSS Server. (<ENTER>=StartNow or <ESC>=DoNotS

} \-------------------------------------------------------------------
```

6. Log in as root. Then run the following command:

   installbvs -c

   The following text, or similar, should appear:

```
[DISKROOT] Setting up pmon --
    pmon_var bootaddr 10.1.5.182
    pmon startup IP is correct, at 10.73.3.3
    pmon route gateway is correct, at 10.73.3.32
    pmon netmask variable is correct, at 255.255.255.0
    Sizes for /sys/lynx.os/vg4_boot/vg4.disk disk kernel:
        2167813 = disk kernel size, bytes
           4234 = (2167813 / 512) = disk kernel size, in 512-byte BLOCKS
           5000 = boot string kernel size, in 512-byte blocks
    Disk Kernel:  want 4234 + 1  ?_<_?  5000    .. OK
    pmon 'diskboot' variable is already correct, at:
        "diskboot -x -d /dev/sd0 -o100 -l5000 -a100000 -- a;g -e
100020"
    pmon bootdelay variable is correct, at 15
    pmon 'autoboot' variable is correct, at:
        "diskboot -x -d /dev/sd0 -o100 -l5000 -a100000 -- a;g -e
100020"
    Sizes for /sys/lynx.os/vg4_boot/vg4.disk disk recovery kernel:
(are same as above)
        2167813 = disk kernel size, bytes
           4234 = (2167813 / 512) = disk kernel size, in 512-byte BLOCKS
           5000 = recovery boot string kernel size, in 512-byte blocks
    Disk Recovery Kernel:  want 4234 + 1  ?_<_?  5000    .. OK
    pmon 'recovery' variable is correct, at:
        "diskboot -x -d /dev/sd0 -o100100 -l5000 -a100000 -- a;g -e
100020"
    Sizes for /vg4install.bin flash kernel:
          9400320 = flash kernel size, bytes
        0x08F7000 = flash kernel size, in bytes (hex)
        0x0900000 = flash boot string kernel size, in bytes (hex)
    Flash rambased kernel:  want 0x08F7000  ?_<_?  0x900000   .. OK
    pmon 'flashboot' variable is correct, at:
        "copy 78000000 100000 900000;g -e 100020"
    pmon spyker variable (num hex bytes for post-mortem buf) is
correct, at:
        "200000"
```

7. When the prompt returns, the process is complete. Restart the server by entering
   stopams.

Palladium Store 1000

The Palladium Store 1000 is housed in a array chassis. It consists of field-replaceable modules that can be hot swapped at your site.

Control Panel

The Palladium Store 1000 Control Panel is attached to the array front cover. You must remove the indicator panel to access the drives.

Paladium Store 1000 (Front cover)
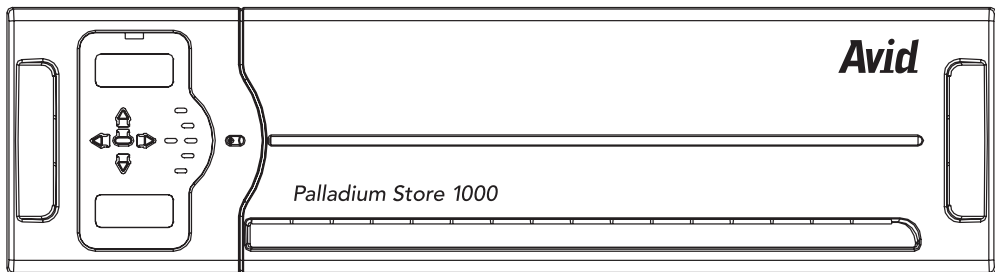
Control Panel
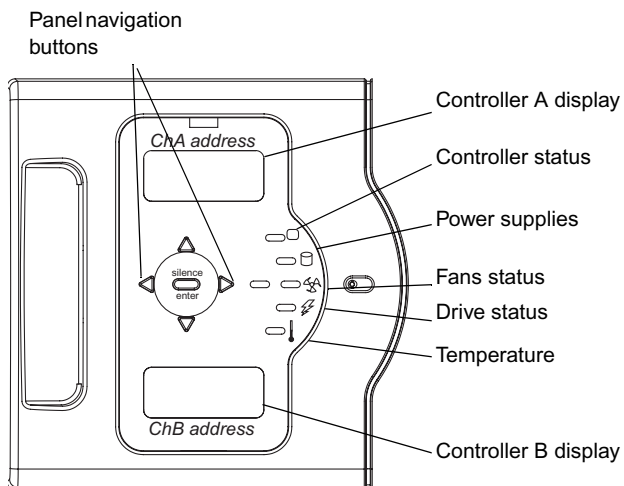
The indicator panel displays the following:

- Controller Address display

- Temperature Status Light – turns red to indicate a cooling failure

- Drive status – indicates drive activity and drive failure

- Fan status – turns red in the event of a fan failure

- Controller Status – turns red in the event of a controller failure

The navigation buttons are used to set addresses for the two controllers. The center button is used to enter values and to silence the alarm.

Hot Swappable Components

The following components can be replaced while the unit is operational:

- Disk drives

- Fans

- Power supplies (dual redundant supplies)

⚠ **There are two fans in a fan module. Failure of one of them will trigger an alarm and the Fan indicator light. A notification will also be sent via SNMP to the System Status window of the MSi. The unit can run safely with one fan in operation. Do not remove the fan module on an operating unit without having a replacement fan ready for installation. Running the Palladium Store 1000 unit without a cooling module for more than a few minutes could result in damage to the unit, and will result in shutdown if temperature thresholds are exceeded.**

Palladium Store 1000: Front without Bezel Cover
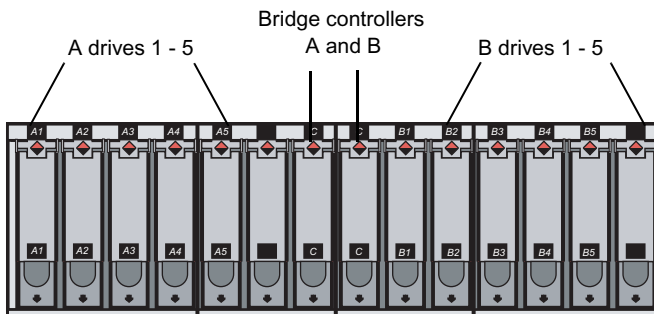
Disks and the 2 bridge modules are accessible from the front of the array after removal of the front panel. Disk drive labels indicate the Drive number A 1-5 (bank A) or B 1-5 (bank B). The bridge modules are labeled *C*.

The Palladium Store 1000's rear panel, shown in the following figure, provides access to the hot-swappable units: the dual redundant power supplies, the Controllers, and a fan module enclosure containing two fans.

Palladium Store 1000 - Rear Panel
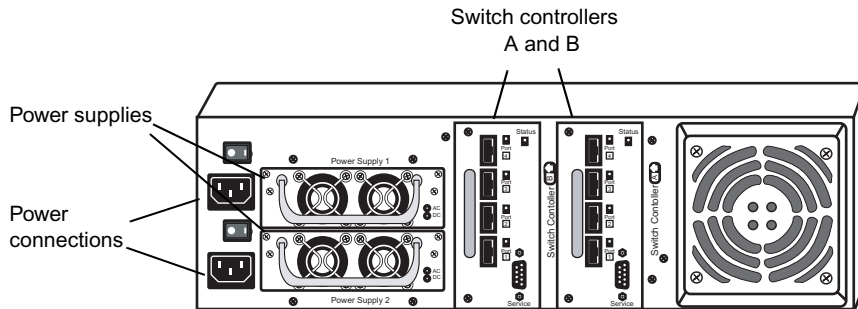
Replacing a Drive

A failed disk drive is indicated by a red LED on the drive indicates in the unit. In addition, a warning is sent to the MSi's System Status window via SNMP. Replace failed drives as soon as possible to avoid loss of content.

Drives are numbered A1 to A 5 in the left bank (bank A) and B1 to B5 in the right bank (bank B). The numbering of drives is the same in the MSi System Status window where any failed drive appears in red.

Make sure you remove the failed drive from the chassis. Removing the wrong drive will result in loss of content.

To replace a drive:

1. Remove the front panel cover to access the drive bay.

2. Press your forefinger into the indentation at the lower part of the drive (see the following figure). The drive pops out slightly.

3. Gently grasp the cover flap and pull the drive a few inches out. Wait 30 seconds for the drive to spin down and then remove it completely from the chassis.

4. Affix the correct drive label on the replacement drive (labels are shipped with the unit).

5. Carefully slide the replacement drive into the drive bay. Open the front flap to guide the disk to the rear of the drive bay until it snaps into rear connection.

6. Press the cover flap down until it clicks in place, locking the drive.

7. Check the drive indicator and the MSi's System Status window to see if the new drive is in place. Drive reconstruction begins automatically "Setting Configuration on a Networked Storage System" on page 190.

Replacing a Disk

Step 1   Step 2

Disk Drive

Replacing the Fan Module

The fan module is housed in the fan slot in the rear of the Palladium Store 1000. A failed fan triggers an audible alarm, and the SNMP indicator in the MSi window turns red, indicating a component failure. There are two fans in the Fan Module, so air should be circulating unless both fans have failed.

Warning: Do not remove the module unless you have a replacement module available. Operating the unit for more than a few minutes without a cooling unit could result in damage to the unit and will cause the unit to shut down once temperature thresholds are exceeded.

Fan Unit and Fan Slot
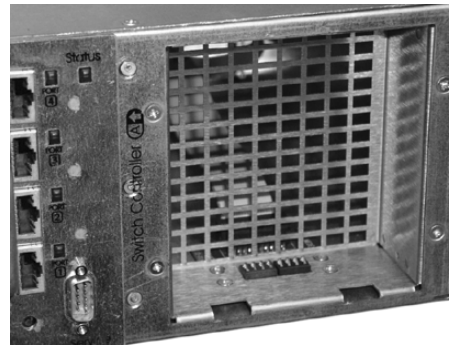
To replace the fan:

1. Grasp the side of the fan unit with your thumb on the top. See Step A in the following figure.

2. Pull the fan unit slightly downward and then pull it towards you to remove it (Step B in the following figure).

3. Position the new fan as shown in Step B. Insert it into the slot as shown in the following figure, Step A until the fan unit snaps into place.

Removing the Fan
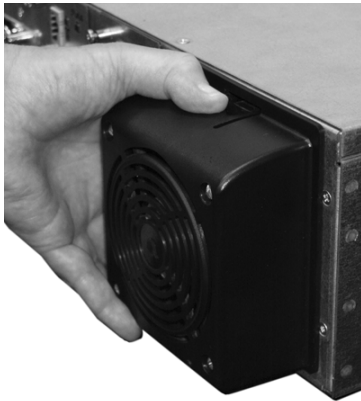
Step 1   Step 2

Replacing the Power Supply

The following figure shows the Palladium Store 1000 power supply. A failed power supply triggers an audible alarm. The LED indicator on the failed unit turns red, and the SNMP indicator in the MSi window turns red, which signifies a component failure.

To replace a power supply:

4. Note the failed power supply's position and check the LED indicator to make sure you are removing the correct power supply. Remove the power connector from the failed unit.

5. Facing the rear of the unit, loosen the two retaining screws (see the following figure).

6. Firmly pull on the retaining handle and carefully slide the unit out of the chassis, making sure to clear any cables in the way.

7. Reverse the process to insert the replacement unit.

Palladium Store 1000 Power Supply

Screws to remove

Pull Handle
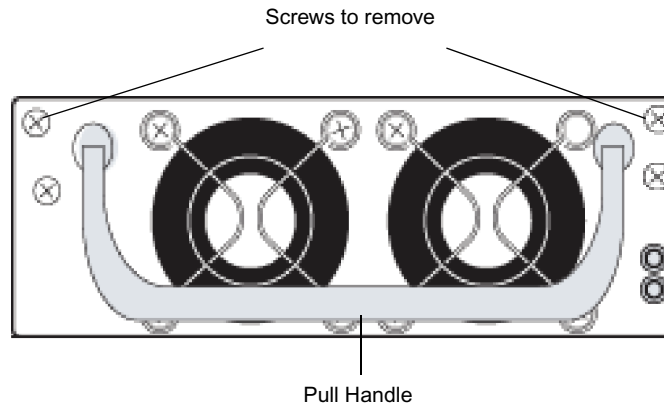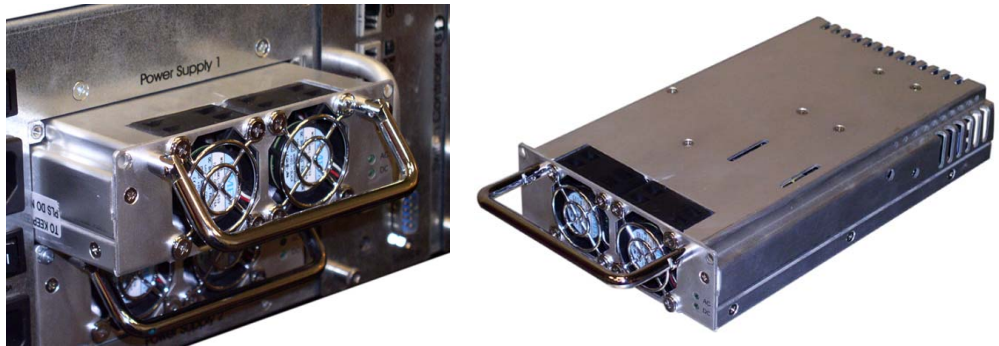
Replacing a Bridge Module

A controller or a bridge failure may indicated by the LED on the front panel and the System Status window on the MSi. The Drive Bay has two Bridge modules.

⚡ **If this is a replacement during an on-air operation, you must contact Avid MediaStream Support before replacing the unit for any special instructions.**

Make sure you have correctly identified the failed unit. The LED above the Bridge module indicates fault.

When a failure is indicated the Bridge and/or it's associated Controller may be involved.If you are unsure which unit is involved and do not wish to replace both, contact Avid MediaStream Support support before proceeding.

To replace a Bridge module:

1. Remove the front panel cover to access the disk drive bay.

2. Press your forefinger into the indentation at the lower part of the Bridge (see the following figure). The Bridge pops out slightly.

3. Gently grasp the cover flap and pull the Bridge completely out of the bay.

4. Carefully slide the replacement Bridge into the bay. Open the front flap to guide the Bridge to the rear of the drive bay until it snaps into rear connection.

5. Press the cover flap down until it clicks in place locking the unit.

6. Place a thumb on the upper and lower portions of the Bridge and provide even pressure to ensure the module is fully inserted.

Bridge Removal

Removing a Controller

To remove the Controller:

1. Loosen the two large retaining screws (on either side of the handle).

2. Remove the cables plugged into the board noting their connection position.

3. Carefully pull the handle out towards you, being careful to clear any cables.

4. Reverse this procedure when inserting a new Controller.

5. Verify the new controller has the correct firmware version and is configured properly.

📖 *See Current Firmware Revision on page 21 for information on checking firmware revision. To upgrade configuration, see See "Setting Configuration on a Networked Storage System" on page 24..*

Controller Removal

Retaining screw

Retaining screw
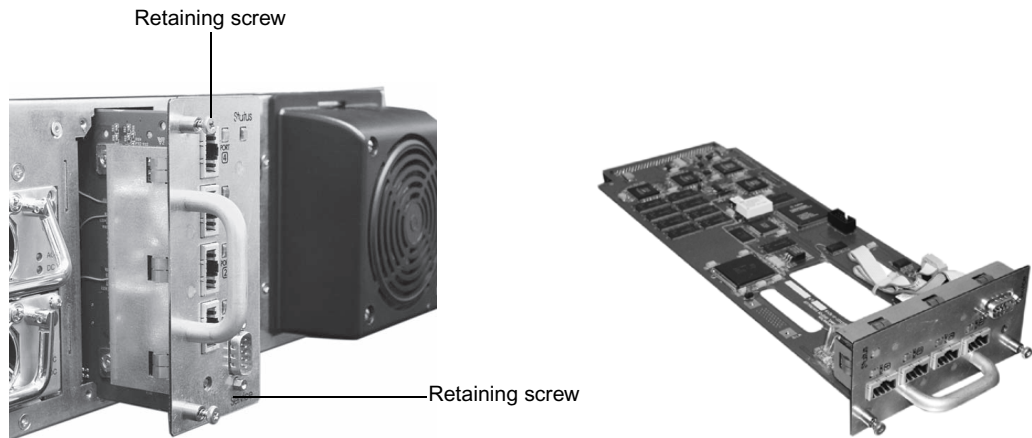
Adding Disk Sets

Additional storage may be added to your unit. For more information on adding storage capacity to your system, consult Avid MediaStream Support.

File System Controller

The power supplies on the FSC are modular replaceable units. This section describes the replacement procedures for these components.

Power Supplies

Follow this procedure to replace a failed FSC power supply.

1. Loosen the captive screw on the front of the power supply unit.

Power Supply Retaining Screw

Captive screw

2. With one hand, push the lever next to the captive screw to the right, and pull out the power supply by the handle using the other hand, until the latch holding the power supply in the chassis is cleared.

Remove Power Supply

3. Continue pulling the power supply unit out by the handle, supporting it with your other hand as it comes out.

4. Insert the new power supply into the bay, pushing it straight in until it locks into place.

5. Tighten the captive screw on the front of the new power supply.

Chapter 10
CLI and Server Node Calibration

CLI (Command Line Interface) is the interface to AMS software. CLI provides access to the same command set used by automation to control playout record and other system functions. You open a telnet session within the MSi application from which to enter CLI commands that perform routine maintenance checks and system adjustments.

This chapter introduces some basic concepts in CLI, including how to record and playback files. The following topics are covered:

*   Recording and playing files

*   CLI command summary

*   Server calibration

*   Decoder adjustments

*   System timing

CLI is accessed from a telnet session. When you log on to a server node, you are in the LynxOS operating system, which has the prompt [root@ 0101 /bvs].

>   Enter: `cli`.

The following prompt displays:

```
Now connected to Broadcast Video Server. Enter 'end' to exit.
bvs:
```

Whenever you are in CLI, the return cursor prompt is prefaced by bvs.

Port Selection

Input/Output ports represent the encoders and decoders on the system. These channels are referred to as video ports. Video ports can be input or output ports. An input port is an encoder. The system logic treats an encoder as a virtual record-only VCR. An output port is a decoder, which is similar to a virtual play-only VCR. Each port has a dedicated RS-422 port that can be directly controlled by an external automation system.

Encoder Ports

An Encoder port records new content into the system. Encoder ports are specified by negative numbers. Encoder port 1 is designated -1. The number in sequence (-2, -3, -4, and so forth) provides access to each additional installed encoder.

Decoder Ports

A Decoder port provides the server with a channel for playing back material. Decoder ports are specified by positive numbers; for example 1, 2, 3, 4 refers to Decoder ports 1, 2, 3 4.

Any action on an Input or Output port requires two steps. First, the port must be *opened*. This only needs to be done once. A port once opened will remain open until it is *closed* or *grabbed* by another device. Second, a port must be selected. Several ports may be opened at once. You must select each port before you begin to execute a command on that port.

Open Port

The open command is used to establish communications between the controlling device and the port. Communications could be coming from an automation system or from the MSi PC. The command syntax is **open? <port>,<lock mode**>

The <port> is the one-digit value of the encoder or decoder port. Encoder ports must be prefaced with a "-" (minus sign). The <lock mode> specifies how the port is opened. A 1 will open the port in the *locked* mode, which will lock access to the port from other devices such as automation. A 0 value will place the port in the *unlock* mode, which will allow the port to be *grabbed* by other communication channels that request it.

For example: **open? -2,0** opens Encoder 2 in the *unlock* mode **–open? 1,1** opens Decoder 1 in the locked mode.

📖 *If you open a port in the lock mode, make sure you close it when you are finished with it. If it remains open and locked, an automation system will not have access when it needs it. To close a port, enter the command* `clos <port>`.

Select Port

Once a port has been opened, you must select it to perform a task with it. The command for selection is `psel <port>`.

For example, `psel -1` selects Encoder 1; `psel 2` selects Decoder 2.

Record

Once an Encoder port has been selected, there are three commands used in recording: cue, record and stop. The cue command is:

`rcue "<filename>",<frames>,<seconds>,<minutes>,<hours>`

Where "filename" (in quotes) is followed by duration in frames, seconds, minutes and hours. The minimum record duration for a spot is 3 seconds.

Once cued, the command for record is `recd.` To stop a file recording in progress, enter stop.

Auto Stop

Record cue requires a specified duration. This duration will act on a clip only if the auto stop mode has been activated. The *enable auto stop* command activates this feature.

To activate auto stop on a selected channel, enter `enas 1`.

Auto stop will remain activated for this port until you deactivate it by entering `enas 0.`

To check the status of a port, enter `enas?`.

A return value of 1 or 0 shows the status of the port.

Recording a File

To record a video file:

1. Enter `open? -1,0` to open Encoder 1 in the *unlock* mode.
2. Enter `psel -1`.

   This selects Encoder 1 for activity.
3. Enter `enas 1`.
4. Enter `enas?`.

You should receive a return value of +1. This verifies you have activated the auto stop mode.

5. Enter rcue **"filename",0,30,0,0.**

   This cues the Encoder port to prepare recording of a file named testspot for a duration of 30 seconds.

File names can have up to 32 characters.

6. Enter **recd** to start the recording.

   The recording stops after 30 seconds. If you disable auto stop, the recording continues until enter the stop command.

7. When you are finished enter **clos -1**.

   This closes the port for Encoder 1.

Playing a File

To play a video file requires two commands, cue and play.

The cue command syntax is **pcue "filename"**.

Filenames of up to 32 characters must be enclosed in quotes.

The play command is play.

Follow these steps:

1. Enter **open? 1,0**.

   This opens Decoder port 1 in the unlock mode.

2. Enter **psel 1**.

   This selects Decoder port 1.

3. Enter **pcue "testspot"**.

   This cues the file testspot for playback.

4. Enter **play** to start playing the file.

5. Enter **clos 1** to close Decoder port 1.

CLI Command Summary

Basic Commands

Basic Commands

`open? <port>, <lock mode>`	Opens a port for use. Lock mode is either a 0 (unlocked) or 1 (locked) psel <port>
`psel <port>`	Selects a port for an action or adjustment
`clos <port>`	Closes selected port
`pcue "id name`	Play cues selected ID name (names must in "quotes")
`rcue "id name"`	Record cues ID with specified file name
`stop`	Stops play/record action on active por
`idel "id name"`	Deletes specified ID name
`idpr "id name"`	Delete protects specified ID name
`idup "id name"`	Delete "unprotects" specified ID name
`end`	Exits CLI and displays the system prompt

Edit Play Commands

`paus`	Pauses play on current channe
`cont`	Continues playing
`step`	Jogs forward 1 frame
`jog <frames>`	Moves forward specified frames
`shtl <rate>`	Shuttles at specified rate according to the Harris manual

Miscellaneous Commands

`drst <port ID>`	Resets decoder for specified port (not decoder number
`vstd <standard>`	Sets video standard NTSC = 0, PAL = 1
`vstd?`	Returns value of current video standard setting
`cbar <value>`	Turns decoder color bar on (1) or off (0)
`sadj <burst, hue>`	Adjusts subcarrier value –1800 to +1800 for both values. Initial value is set to 0,0
`sadj?`	Current subcarrier value
`hsyn <value>`	Sets Horizontal Sync timing within range of 0-8181. Initial value 3072
`hsyn?`	Returns current setting
`dagn <chan, increment>`	Sets audio gain of channel (1, 2, 3 or 4)
`dagn? <chan>`	Returns current setting
`dvgn <increment>`	Sets video gain of the channel
`dvgn?`	Returns current value
`stat? <bitmap>`	Returns port status bits for active channel stat? 15 returns all bits

Server Calibration

Board-level calibration is performed in a telnet session using CLI commands or through the MSi. The following board calibrations can be performed and are outlined in this section:

- 4:2:2 Decoder analog output adjustments – CLI video and audio gain adjustments
- Horizontal line timing – Adjusted in the MSi application
- Subcarrier phase – Adjusted in the MSi application

You will need a waveform monitor and vectorscope to perform the horizontal line timing and subcarrier phase calibrations on the 4:2:2 Decoder.

Audio Level Indicator

Input audio headroom adjustments measure the audio level going into the server node's encoder. Use the MSi application to verify the audio level of the digitized audio input signal.

1. In the MSi application, click the Rec1 button.

2. In the Record window, go to Cal > Audio Input Level. This Audio Input Level dialog box is displayed:

Audio Input Level
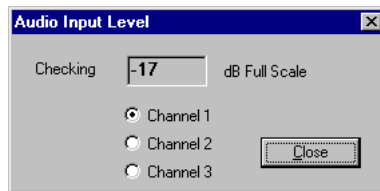
3. Make your adjustments on an external box, soundboard, and so forth.

📖 *On this dialog box, Channel 1 refers to AES 1 channels 1 and 2. Channel 2 refers to AES 2 channels 3 and 4. When reading values for each Channel pair, the values in each channel are not additive. Thus the higher value of the two channels displays in the window. For example, if AES 1 channel 1 has an input level of –10 dB and channel 2 has an input level of –20, the dialog box displays the value of –10. To adjust the levels correctly, disconnect the channel you are not monitoring.*

📖 *The input audio signal to the encoder is always digital audio. 0 dB is a hard clip. This means that as you approach 0 dB full scale, the audio signal will become severely distorted.*

Recording Test Video

This section describes how to record test content to the server's storage system. You will use this test content to calibrate the decoder output.

In the MSi application, you need to have a Record window configured for each encoder in the server. Verify that you have a Record window configured for each encoder.

The following steps describe how to record a five-minute tone and color bars video for each encoder:

1. Connect the tone and color bar video source to the encoder.

2. In the MSi application, click the Rec1 button.

3. Enter test1 in the Record File ID field.

4. In the Duration field, enter a duration of five minutes (00:05:00:00).

5. Click the Rec button at the top of the Record window and wait five minutes for the color bars to record.

6. If you have a second encoder installed in the server, open its Record window; for example, click the Rec2 button. Enter `test2` in the Record File ID field, and click the Rec button.

4:2:2 Decoder Adjustments

You will start a telnet session and log on as root to enter CLI mode, or use the MSi application to make decoder video and audio adjustments. Adjustments include:

• Video Output—CLI

• Audio Output—CLI

• Horizontal Line Timing—MSi

• Subcarrier Phase—CLI

There is no adjustment for digital output.

Adjusting Video Output

To adjust video output:

1. Via Telnet, log on as root to the server.

2. At the command line prompt, enter **cli**.

3. At the prompt, enter **grab? <port>,1**

   where port is the number of the decoder card (1 to 16) that you want to adjust.

   For example, **grab? 1,1** specifies Decoder card 1.

⚠ **The grab command takes control of the port from the automation software.**

4. Select the Decoder port by entering: **psel <port>**

   where port is the Decoder port number.

5. Cue the test file by entering: **pcue "test1"**.

📄 *The name of the test file must be enclosed in quotation marks.*

   Wait three seconds for the file to cue.

6. Play the test file by entering: **play.**

7. Enter the command **`dvgn?`** to return the current video gain setting. The setting is reported in units of 1/10 IRE.

8. To adjust the video setting, enter **`dvgn gain`**

   where gain is the channel gain in units of 1/10 IRE. Valid values range from –375 to +375
   (–37.5 to 37.5 IRE).

   The following example sets the video gain to 10 IRE: **`dvgn 100`**.

   If you cannot complete your adjustments before the test file finishes playing, repeat the pcue and play commands.

9. When the video setting is correct, enter **`close port`**.

   This command enables the automation station to take control of the port.

1. Repeat the above steps for each decoder.

1. To exit the CLI interface, enter **`end`**.

Adjusting Audio Output

To adjust audio output:

1. Using telnet, log on as root to the server.

2. At the command line prompt, enter **`cli`**.

3. At the prompt, enter **`grab? <port>,1`**

   where port is the number of the decoder (1 to 16) that you want to adjust. For example, **`grab? 1,1`** specifies Decoder card 1.

   The above command takes control of the port from the automation software.

1. Select the Decoder port by entering: **`psel <port>`**

   where port is the Decoder port number.

2. Cue the test file by entering: **`pcue "test1"`**.

   Wait 3 seconds for the file to cue.

3. Play the test file by entering: **`play`**.

4. To see the current audio setting, enter **`dagn? <channel>`**.

   where channel is the audio channel number (1 to 8). The command returns the current audio level, in units of 1/10 dB, for the specified channel.

5. To adjust the audio setting, enter dagn **`<channel>,<gain>`**

   where *channel* is the audio channel number 1, 2, 3, 4, 5, 6, 7, or 8.

The following example sets the gain for audio channel 2 to 5 dB: `dagn 2, 50`

Gain is the channel gain in units of 1/10 dB. The value specified must be in increments of 0.5 dB. Valid values range from –102.5 to +250 (-10.25 to 25.0) dB.

If you cannot complete your adjustments before the test file finishes playing, repeat the pcue and play commands.

6. When the audio setting is correct, enter `close <port>`.

   The above command enables the automation station to take control of the port.

7. Repeat the above steps for each decoder.

8. To exit the CLI interface, enter **end.**

Horizontal Line Timing

The purpose of this adjustment is to compensate for line delays from the server to the broadcast router. This adjustment will synchronize the server to the station reference (black burst) signal. You will need a waveform monitor for this adjustment.

Your setup should be similar to the example shown. If you use serial digital output, perform this adjustment using your digital-to-analog converter and all other devices that could cause delays to the station router (see dotted line in the illustration).

If you use a frame sequencer on your digital video output, this adjustment is irrelevant.

Horizontal-line timing adjustments you make affect both analog and digital output. If you require separate timing for one of them, use an external delay line.

Calibration Setup

The following figure shows an example of the calibration setup for a server with two encoders and two decoders. If you are using analog output only, ignore the dotted line and the D/A Converter on the output. See Connecting System Components for information on connector types. If you have a second encoder, connect the loopthrough as shown here.

Calibration Setup for Node with Two Decoders
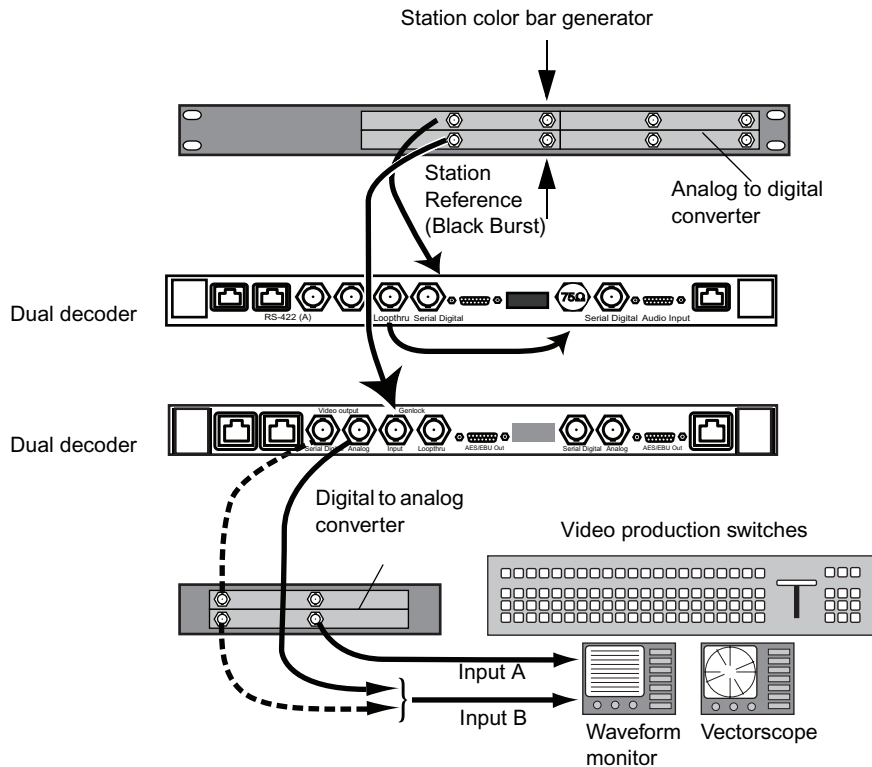
The signal is output from the server's decoder to the digital-to-analog converter, then to a vectorscope/waveform monitor at the production switcher. The black portion of the color bar signal is then synchronized to the station reference at the station router.

The following adjustments should be made to your A/D and D/A Signal Converters:

• Video level

• Audio headroom

• Audio output level

See the documentation provided by the manufacturer of these devices for information on how to perform the adjustments.

Instructions for using MSi to play the color bars test video through a decoder and for making adjustments to the signal via your waveform monitor follow.

1. In the MSi application, open the Play window configured for Decoder 1. For example, click the Play1 button.

2. Do one of the following:

   - Click the Insert button at the top of the window.

   - Press the Insert key on the keyboard.

   - Go to Edit > Insert ID.

   A new item line appears in the Play window.

3. Move the mouse pointer to the blank File ID field and right-click. The Field ID Search window allows you to select a file to add to the Play window. In the Field ID Search window, double-click the file that contains the color bars test video that you previously recorded. Information about the file then appears in the fields in the Play window and the file is selected (highlighted).

4. With the test video file selected, click the Play button at the top of the Play window. The file is first cued, and then playout begins.

5. Go to Cal > Horizontal Line Timing to display the window shown in

Horizontal Line Timing Window
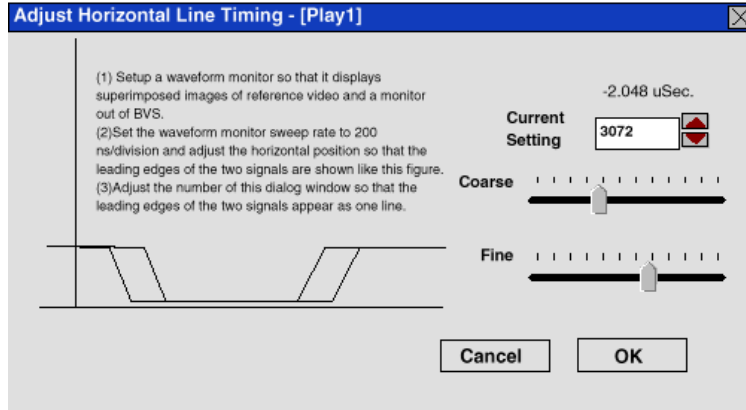
6. Look at the waveform monitor. Settings are listed in the illustration shown in the following figure. Adjust your waveform monitor until you see a similar display.

Waveform Monitor Settings

Waveform Monitor / Vectorscope

Mode	Waveform Monitor
Input	A/B
Sweep	200 ns / division
Reference	Internal
Vertical Gain	Calibrated position
Horizontal Gain	Calibrated postion
Line Sample	15 lines

Superimpose leading edges. At MSSI type:

hsyn?	queries horizontal sync setting
3072	factory setting
hsyn n	n is 0 to 8191
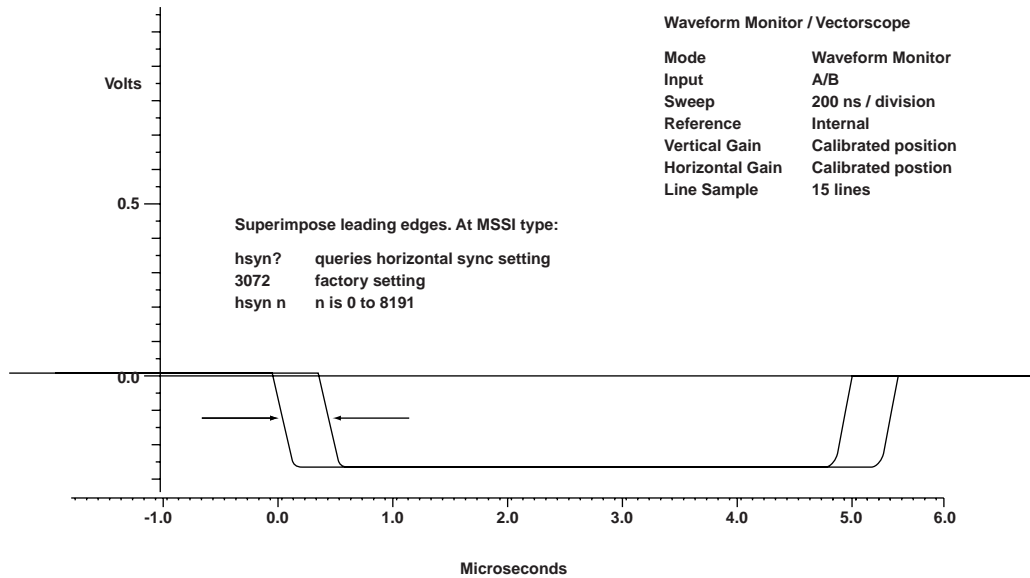
Most waveform monitors display the falling or rising edge of the signal. This procedure will synchronize on the falling edge of the signal. When the two edges are superimposed (looks like one line), this adjustment is complete.

7. In the Adjust Horizontal Line Timing window, move the adjustment bars for coarse and fine until the two edges are superimposed to appear as one line.

8. Change your waveform monitor setting to SCH phase to fine tune horizontal line timing.

Example SCH Phase Adjustment

This figure shows the Server SCH is about -30 degrees out of phase

Waveform Monitor / Vectorscope
Mode   SCH phase
Input   B
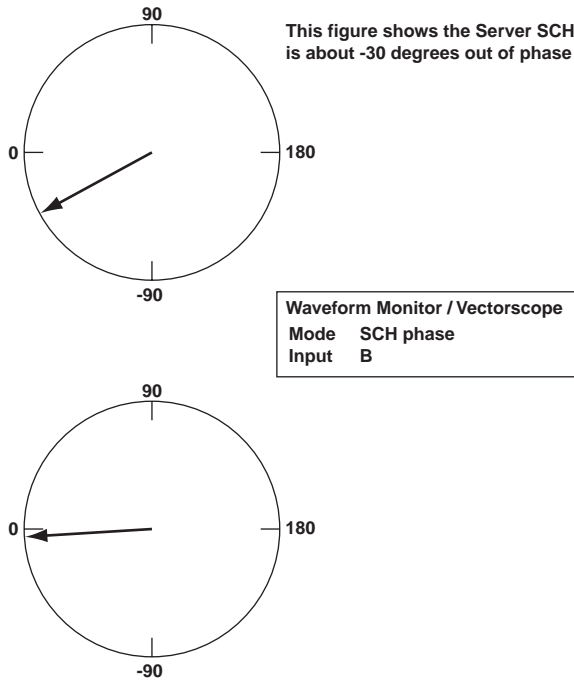
9. In the Adjust Horizontal Line Timing window, move the slider for the Fine setting to bring the SCH phase as close to zero as possible.

This completes the horizontal line timing for Decoder 1. Without changing the cabling setup for Decoder 1, proceed to the subcarrier phase adjustment described in the next section.

Subcarrier Phase (Colorburst Phase)

Your vectorscope should display the subcarrier phase of the server's analog video output superimposed on the subcarrier phase signal of the reference video output.

Use CLI commands to play the test video you previously recorded:

1. In the telnet window, log on as **root**

2. At the command line prompt, enter **cli**.

3. At the prompt, enter **grab? <port>,1**

where port is the number of the Decoder card (1 to 6) that you want to adjust. For example, **grab? 1,1** specifies Decoder card 1.

⚡ **The above command takes control of the port from the automation software.**

4. Select the Decoder port by entering `psel <port>`

   where port is the Decoder port number.

5. Cue the test file by entering pcue `"test1"`.

   Wait 3 seconds for the file to cue.

6. Play the test file by entering `play`.

7. While the color bar signals are playing out, change the setting on your waveform monitor to vectorscope mode. On the vectors cope, set both input A and input B to be displayed.

   The following figure shows the video output out of phase with the targeted reference signal.

Adjustment of Server Node's Video Output
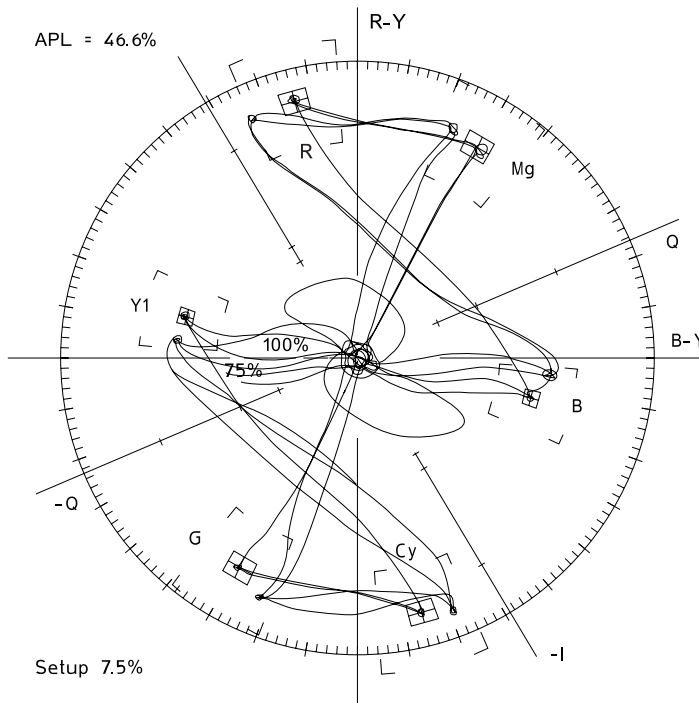
The point of this adjustment is to align the signal from the server as closely as possible with the reference signal on the R, Mg, B, Cy, G and Y1 targets (that is, each of the dots of the connected vectors should fall into the corresponding rectangle of the targeted reference signal).

To make a clockwise adjustment of 4 to 5 degrees should align the server's video output with the reference signal.

8. Use the CLI `sadj` command to adjust the signal:

   To see the current setting, enter `sadj?`.

   To rotate the vector, enter `sadj <value>,0`

   where value is the rotation in units of 1/10 degrees. Negative values rotate clockwise, while positive values rotate counter-clockwise. Valid values range from –1800 to +1800 (–180 to +180 degrees).

   For example, the command `sadj -40,0` rotates the vector clockwise 4 degrees.

Continue to change the values of the subcarrier phase until the display on your vectorscope looks similar to what is shown in the following figure.

Correctly Adjusted Server Node's Video Output
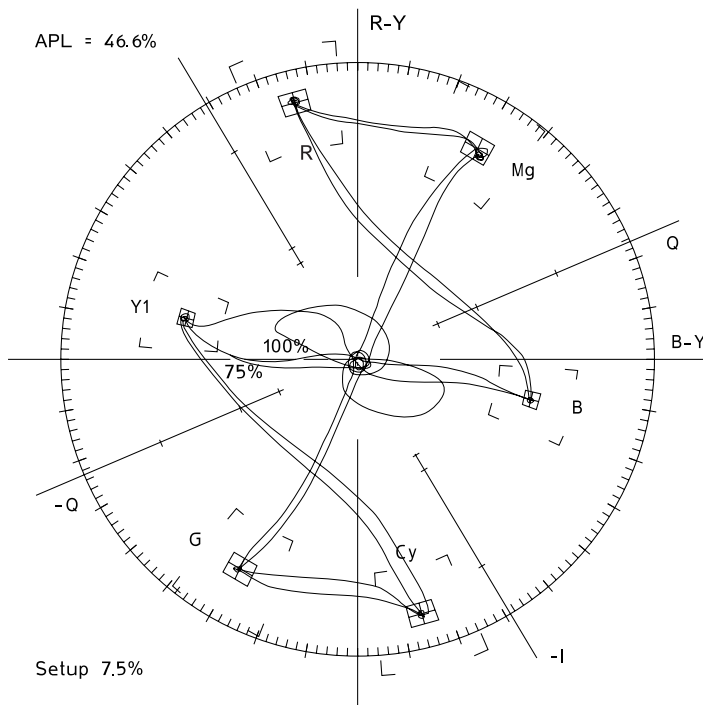
The tips of the connected vectors all fall within the boxes. This completes the serial digital video adjustments for Decoder 1. Enter `close1` to close the port.

9. Repeat the above steps to adjust the other decoders you may have in your server.

10. To exit CLI, enter **end.**

Chapter 11
Software Recovery and Upgrade

This chapter describes the procedures for system recovery and upgrading major system components of a MediaStream NSS to the current software release.

System recovery and software upgrade are distinct and separate procedures. The recovery process brings failed systems back online and then reinstalls the software. Software upgrades install new releases of software on existing products. Following the recovery procedure, software upgrade is required for all components.

Refer to the current software upgrade instructions (posted on the Avid MediaStream Support web site @ www.pinnaclesys.com/support), or contact Avid MediaStream Support.

Perform upgrades in the following order to ensure system operating integrity:

1. MSi PCs
2. FSC PCs
   - FSC 1 – First
   - FSC 2 – Second
3. MSS 8000 Server Nodes
4. Disk Array Firmware

Upgrade all components (the complete System). Your System's integrity may be compromised if any component is more than one revision back from the current software upgrade release.

Do not proceed with any upgrades if your System is not fully functional due to some type of malfunction until you have consulted with Avid MediaStream Technical Support.

This chapter covers the following topics:

- MSi system recovery
- MSi backup and restore
- MSi software upgrade
- FSC system recovery
- MSS 8000 boot drive removal and replacement

Software Version Numbers

Software Releases for the MSS Networked Storage System are shipped on two discs:

- Disk one contains the MSi PC and MSS 8000 software
- Disk two contains FSC PC software

To track overall system releases, a System Version number will be given to the overall release.

Software Release Version

System software revision numbering: 0X.YZ

- **X** is the current major release number
- **Y** is the minor release number
- **Z** indicates a patch number

MSi software revision numbering: A.X.YZ

- **A** indicates MSi software
- **X** is the current major release number
- **Y** is the minor release number
- **Z** indicates the patch number

A complete upgrade on the device is necessary for any change in the revision number.

FSC software revision numbering: G.0X.0Y.ZZ

- **G** indicates FSC software
- **X** is the current major release number
- **Y** is the minor release number
- **Z** indicates the patch number

A complete upgrade on the device is necessary for any change in the revision number.

MSS 8000 software revision numbering: C.XX.YZ

- **C** indicates that this software is for use with a Avid MediaStream Networked Storage System.

- **XX** is the major revision of software. If you are installing software that has a different major number than the software you are currently running, you *must* check with your automation vendor before installing this software.

- **Y** is the minor revision number. A change in the minor number indicates minor feature changes and bug fixes. A change of minor release does not include any changes that will affect control of the servers via automation.

- **Z** is a patch level; the **Z** number indicates the number of patches installed on top of the minor release. Installing additional patches does not require a complete re-install of the software.

🖹 *Versions C.15.XX provides for the use of longer (32-character) file names. The "Long File Names" feature should only be enabled with approval of your automation vendor as their software may not support its use, or may need configuration changes to accommodate it. If desired, the MSi application can be then enabled to allow it to create and reference these longer file names. You can do so by selecting Setup/Configuration menu from the application's title bar and clicking the Long File Names option in the resulting dialog box.*

MSi Software Backup and Recovery

This section describes how to:

- back up and restore MSi files
- restore the MSi PC to its original configuration using the Recovery CD
- upgrade the MSi software

Backing Up MSi Files

The MSi application includes a backup function to back up MSi playlists and configuration files. After making any changes to the MSi configuration, back up the MSi data files. The files that are backed up include all files in the C:\Program Files\Hewlett-Packard/data directory and the msi*.ini files and applet registry information (located in the Windows 2000 directory on the C drive).

🖹 *You can back up data while the MSi application is running, but not while playing out from a playlist.*

To back up MSi data and configuration files:

1. From the MSi main menu, select File > Backup User Files. Enter the drive and directory path in the text box.

2. If the directory chosen already has data on it, you are warned that existing MSi files in the backup directory will be deleted. Click OK to continue, or click Cancel and choose a different backup directory.

   Your files are copied to the specified directory.

Restoring the MSi Files

If your original MSi data and configuration files have been corrupted, they can be restored using the MSi Restore program. In order to run the program, you must quit the MSi application. To restore configuration files:

1. Start restore.exe.

• Locate the restore program icon in C:\Program Files\Pinnacle\MSi directory and double-click it, or

• Select Run from the Start menu. Click Browse and locate the restore.exe file in the MSi directory. Click OK.

MSi User File Restore Utility
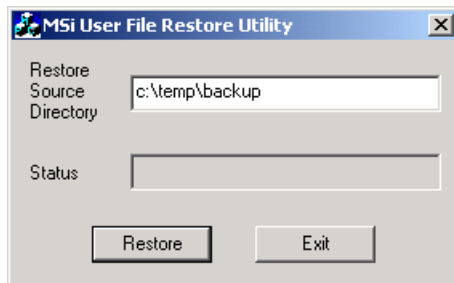
If MSi does not find a configuration file, you are prompted to enter the information.

2. Enter the directory path of the back up files, such as C:\Temp\backup or your CD backup disc.

3. Click Restore.

4. Click Exit and restart MSi. Your configuration files should have been successfully restored.

5. Restore the network settings on the MSi PC. Refer to the *MediaStream Video Server Installation Guide* and consult with your network administrator.

MSi System Recovery

The MSi Recovery CDs are provided to restore a malfunctioning MSi PC to its original configuration. The discs may be required if the original hardware needs to be replaced, or if the Windows 2000 operating software has been corrupted.

The MSi Recovery process destroys all data and settings. Use this procedure only if other problem-solving efforts have failed.

To perform an MSi system recovery:

1. Insert the first MSi Recovery CD and turn on the MSi PC.

2. The MSi boots up in the Symantec Ghost program. Choose "Re-image and Walk Disk" from the menu. Note that there is no warning step in this procedure, so be sure that a full re-image is what you want to do.

Ghost Startup Menu


```
Microsoft Windows 98 Startup Menu

1. Re-image and walk the disk on this system.
2. Run ghost manually.
3. Run GhostWalker separately but non-interactively.
4. Run GhostWalker separately and interactively.
5. Get a report on the disk.
6. Get fingerprint info from image.
7. Examine or manipulate the disk partition table with Gdisk.
8. Get to a command prompt.

Enter a choice: 1




F5=Safe mode  Shift+F5=Command prompt  Shift+F8=Step-by-step confirmation [N]
```

The main Ghost window appears, and the program runs automatically.

3. After 5 to 10 minutes, the Ghost program asks for the second recovery CD. Insert this CD and click OK

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Insert Second CD
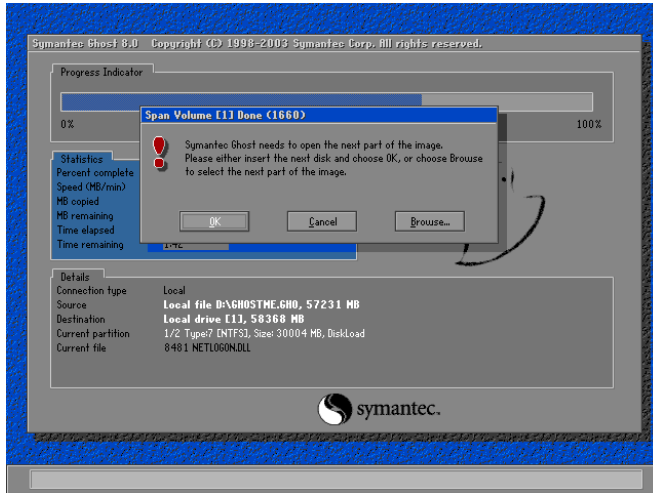
After all files have been copied off the second CD, the Ghost Walker program starts automatically. This program verifies disk and file information

Ghost Walker

4. .When Ghost Walker completes, you will see a DOS prompt. Remove the second recovery CD and press CTRL+ALT+DEL to restart the MSi PC.

📖 *On the first boot following a system recovery, the automatic Windows file system check will display many error messages. This is normal, and should not have any further effect on the operation of the MSi PC.*

5. Following the file system check, the PC will display a message indicating that system settings have changed, and asking if you want to restart. Click Yes to restart the PC now. The PC should start up normally.

You can now reinstall the MSi and optional gateway software (and any upgrades required to bring the software to the current version) and restore the MSi data and configuration files.

MSi Software Upgrade

MSi software updates take about three minutes to perform. Follow these steps:

1. Close all applications and turn off the MSi.

2. Insert the MSi upgrade CD into the drive. The setup program starts automatically.

MSS Server and MSi Setup Dialog Box
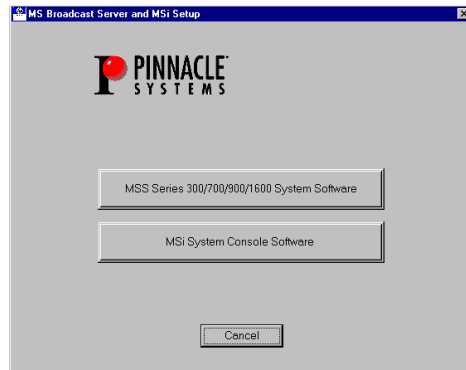
3. Click MSi System Console Software. The MSi Setup program runs.

4. When prompted to select a model, select the MSS 8000 series and click Next.

5. Click Yes to display the Release Notes, otherwise click No.

6. Click Next to start the installation, which takes less than a minute to complete.

7. Click Yes, I want to restart my computer now.

8. Click Finish.

Run Configuration Utility for MSi

After installing the upgrade software, the next step is to run the MSi configure application. This application configures all machine-specific settings for networking, communication, and application initialization.

The Configure application automatically performs the settings required to make each MSi unique within the overall system architecture. It is recommended that you run this application after any system upgrades.

Configure provides tools to change varying degrees of settings on the MSi PC. The choices are:

- Complete Configuration – configures all required settings
- MAC Address update – resets the MAC address for the PC
- MSI .ini – changes the .ini and hosts files only

The complete configuration automatically makes over 300 changes including:

- Updates all VLAN settings in the registry
- Updates the TCP port for the Solid database in the registry
- Changes the name of the MSi in the registry to the desired Cluster ID
- Updates the MAC address for the VLAN card as well as the LAN cards
- Sets the NTP server to the Primary (01) FSC.

To run the application:

1. At the command prompt, enter `cd: C:\` to return to the C directory.

   The prompt should be `C:\>`.

2. Enter `config`.

```
C:\> config
----------------------------------------------------------------------
----------------------------------------------------------------------
                 CONFIG Version 2.00
----------------------------------------------------------------------
----------------------------------------------------------------------


        Press:  'C' Complete Configuration.
                'M' only MAC-Address update.
                'H' only create hosts and lmhosts.
                'X' for exit!

        Please enter one of the Items:
```

3. Press C to select a complete configuration.

4. Enter the number for the MSi you are upgrading – 1 for Primary or 2 for Secondary.

5. When prompted, enter the cluster number:

   Please enter the Cluster number [1..16]: 10

6. When prompted, enter the MSi number:

   Please enter the MSi number [1 or 2]: 2

7. Enter the cluster number for the system. This setting is crucial to make sure the LAN and configuration settings are correctly configured. MSi will not be able to communicate over the network without the correct setting.

Allow the Config tool to complete it's operation before continuing. This may take some time. Attempting to exit the tool before completion may generate errors, and may require reimaging of the PC.

Upon completion, the following output displays:

```
--------------------------------------------------------------------

       Total of all changes: 267
       Total of all errors:  0
        MSI_Name-Update is done.

--------------------------------------------------------------------

       Creating hosts and lmhosts and saving the old ones.
       Total of all changes: 269
       Total of all errors:  0
        Creating the hosts and lmhosts is done.

--------------------------------------------------------------------

                        Updating the registry done.
                              PLEASE REBOOT
```

8. When the script has completed, make sure that the total of all errors is 0.

    -   If the total of all errors is 0, reboot the MSi. The system should boot normally and the MSi Control Panel should start automatically.

    -   If the total of all errors is not 0, run the script a second time. If errors still appear, call Avid MediaStream Support.

9. Open a command prompt, and then run the checkLan utility, which pings all relevant LAN connections from the selected FSC. See "checkLan" on page 325.

Configuring Network Settings for MSi

After running the MSi configuration utility, set the Link Speed & Duplex value for LAN 2 to Auto-Detect. Follow these steps:

1. Right-click My Network Places on the Windows desktop and select Properties from the menu.

2. In the Network and Dial-up Connections dialog box, right-click Vlan adapter and select Properties from the menu.

Network and Dial-up Connections
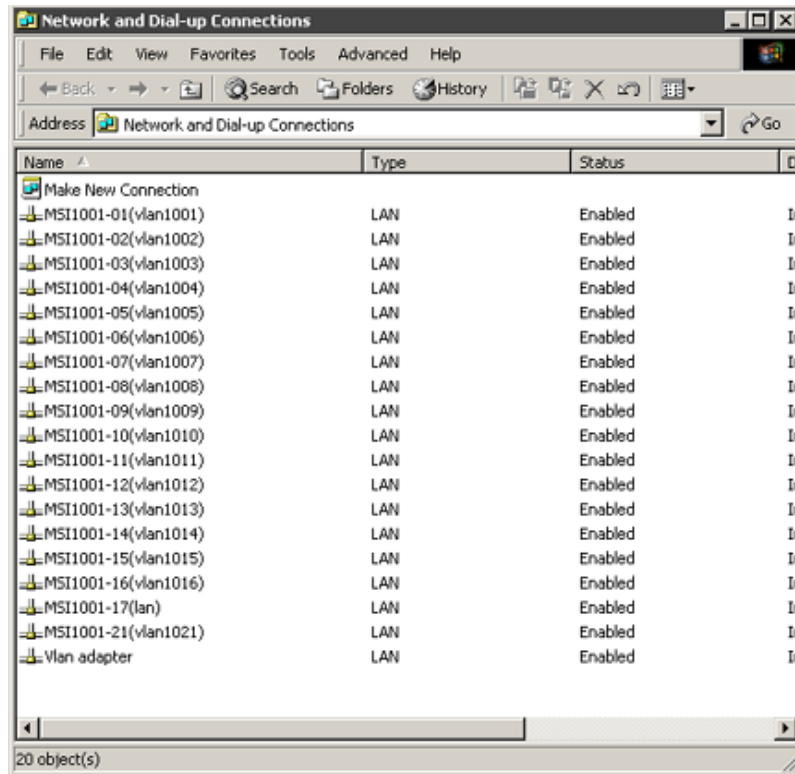
3. In the LAN 2 Properties dialog box, click the Configure button.

LAN 2 Properties
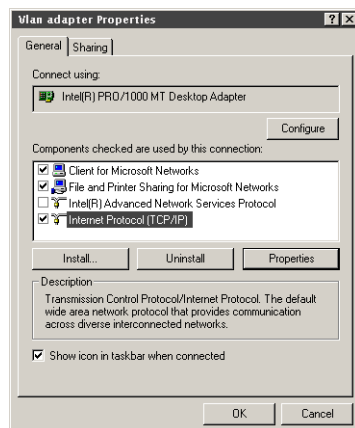
4. The Desktop Adapter Properties dialog box displays. Select the Advanced tab.

5. In the Advanced tab, select Link Speed & Duplex from the Property list. For this value, select Auto Detect. Click OK.

Desktop Adapter Properties
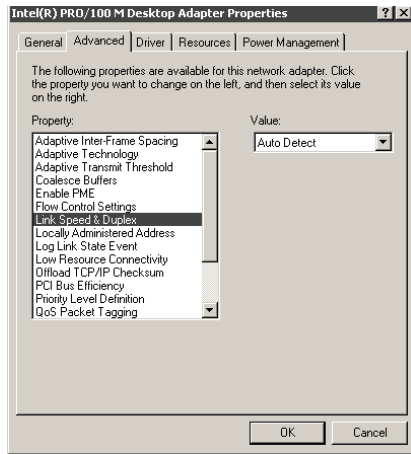
The last step for the MSi setup is to set the virus protection program to run automatically.

Set the Virus Protection Program to Run Automatically

To set up the virus protection program:

1. Right-click My Computer and select Manage from the menu.

2. In the Computer Management dialog box, expand the Services and Applications directory in the left pane.

3. Select the Services subdirectory. A list of the Services is displayed in the right pane

Services List
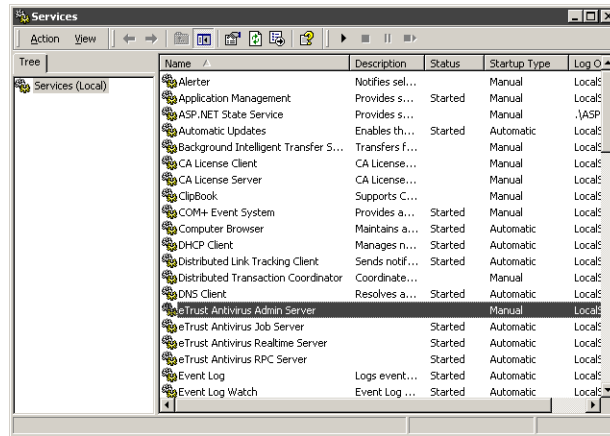
4. Locate *eTrust Virus Admin Services* in the list and double-click it.

5. In the General tab of the eTrust Properties dialog box, select Automatic as the startup type. Click OK

eTrust Properties
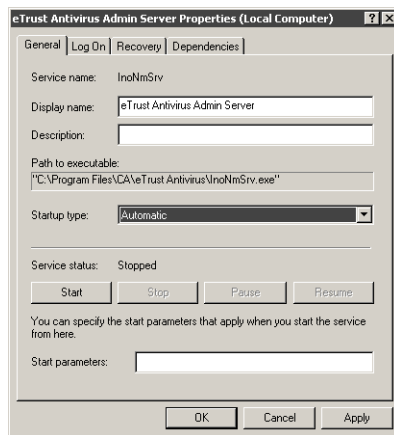
The virus-protection program should start automatically whenever you start the MSi computer.

FSC System Recovery

The FSC Recovery CD is provided to restore a malfunctioning FSC to original configuration. This disc may be required if the original hardware has been replaced or the operating software has been corrupted, causing the unit to malfunction. The FSC recovery procedure will destroy all previous data and settings and should be used only if other problem-solving efforts have failed.

Before attempting to perform this operation, make sure the other FSC is operating reliably. Should both FSCs fail, the System will be brought off-air.

Do not run the recovery CD on both FSCs at the same time or all database content will be destroyed and access to any recorded content on the array(s) will be lost. Only begin the recovery procedure on the second FSC after recovery, upgrade, configuration and startup have been performed on the first. If you encounter problems starting the FSC after recovery, review the troubleshooting tips in "Troubleshooting Database Problems" on page 327, or call Avid MediaStream Support.

To perform a FSC recovery:

1. Make sure you have selected the correct FSC for recovery.

If you will be running recovery on both FSCs, first start the procedure on FSC 1, if possible. This will leave FSC 1 as Primary when the procedure is completed on both units. If you are doing this, make sure that FSC 2 is in the Ready state before beginning.

2. Insert the first recovery CD (number one of two Recovery CDs) in the FSC's CD-ROM drive and then restart the computer.

3. In the Microsoft Windows Startup Menu, press 1 (re-image and walk the disk on this system) to begin the recovery process.

Startup Menu
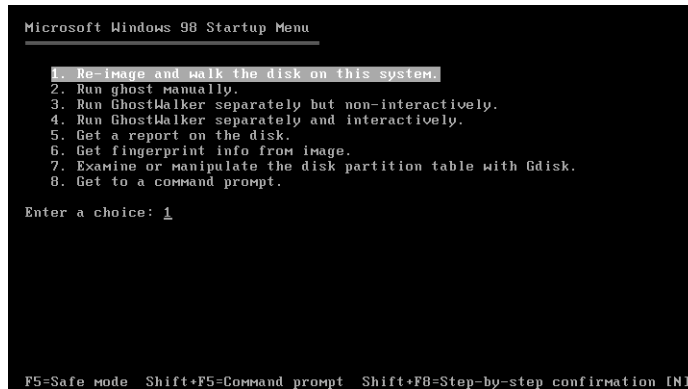
4. The recovery continues automatically. When prompted to insert the second CD, insert it and click OK

Insert Second Recovery CD
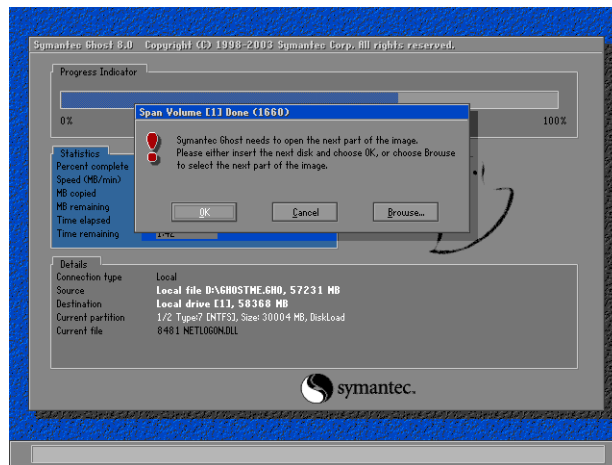
5. You can monitor the installation's progress via the Progress Indicator.

Installation Progress Indicator
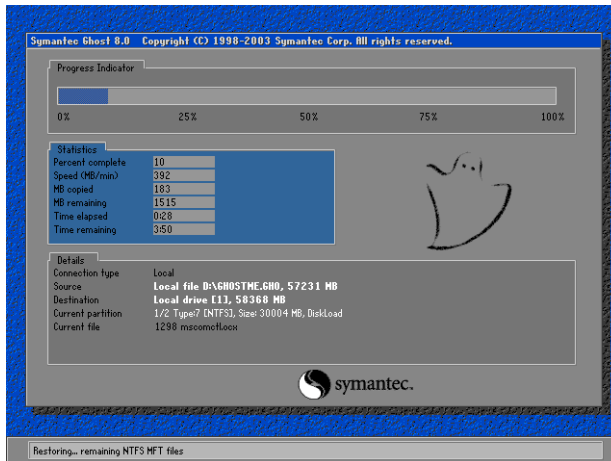
1. After the installation is complete, the system is verified.

System Verification
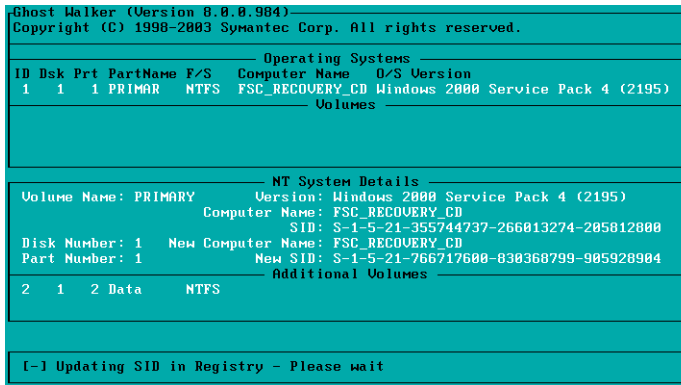
2. After verification, restart the computer. The first time the FSC starts up after the recovery, allow the disk check to proceed.

Disk Check
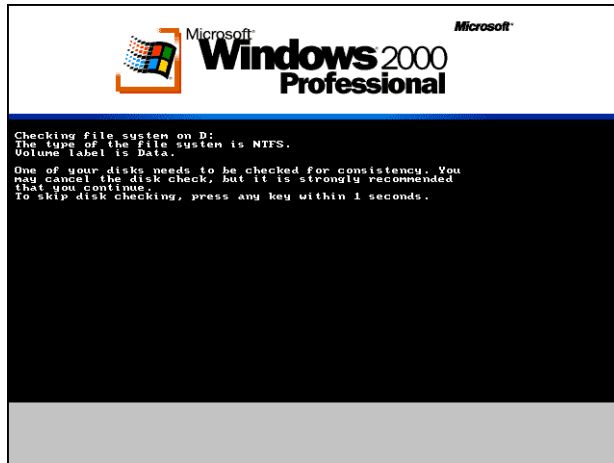
FSC Software Upgrade

FSC software updates involve checking the status of both FSCs, and then inserting a CD-ROM into the FSC 1 and starting the upgrade. You should complete the upgrade of FSC 1 before upgrading FSC 2.

Preparation for FSC Upgrade

📑 *This procedure assumes that you have already upgraded to the current MSi version. If you have not already done so, perform the MSi upgrade first.*

Opening FSC Telnet Session
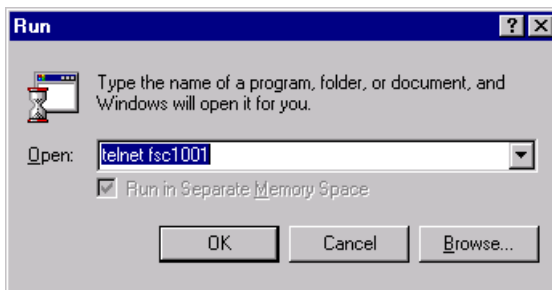
FSC Status Checks

1. From the MSi PC, open a telnet session for each FSC. To start a telnet session, go to Start > Run and enter telnet fscXX0Y where <XX> equals the cluster number of the system and <0Y> equals 01 for Primary FSC or 02 for Secondary FSC.

2. From either FSC, check FSC Status by entering `fsc_status`.

📑 *Make sure both FSCs are running in a Ready state before beginning upgrade procedure.*

```
SANSERVICE

   Status        Ready                 Ready
   Role          SECONDARY             PRIMARY
   Connection    CONNECTED             CONNECTED
   Remote DB     tcp 10.73.22.2 1325   tcp 10.73.22.1 1315


   Operations    133852                138163
   Date          10/02/2001            10/02/2001
   Time          09:37a                09:37a S
   Size          39,354,368            39,354,368

SANSERVICE

   Status        Ready                 Ready

WATCHDOG
```

3. Check the current software revision on each FSC by running the command `fsc_revisions`.

```
FSC revisions in the FSC upgrade CD:
FSC_G.01.06.00
```

Video Files Status Check

From the MSi, click the Clean Files button. When the Check Video Files window appears, click Start Checking Video Files followed by OK. If this procedure finds any defective video files, delete them now and re-run Clean Video Files until no defective files appear. You can then re-dub these files after the upgrade procedure is complete.

After the check procedure is complete, click the Close button.

FSC Status Check

Normal upgrades of the FSCs can be run via Telnet.

📖 *You should begin your upgrade on FSC 1 unless otherwise directed by Avid MediaStream Support.*

⚠️ **Do not attempt to upgrade FSC 2 until the upgrade of FSC 1 has successfully completed and both FSCs are running. Not observing this sequence will bring your system off-air.**

At the telnet prompt, enter `fsc_status` to verify the two FSCs are in a Ready state. See the following figure.

FSC Status Report

```
SANSERVICE

   Status        Ready                   Ready
Role          SECONDARY               PRIMARY
Connection    CONNECTED               CONNECTED
Remote DB     tcp 10.73.22.2 1325     tcp 10.73.22.1 1315
Operations    133852                  138163
Date          10/02/2001              10/02/2001
Time          09:37a                  09:37a
Size          39,354,368              39,354,368


SANSERVICE

   Status        Ready                   Ready


WATCHDOG
```

Installing or Upgrading the FSC Software

📖 *Refer to the current software upgrade instructions (posted on the Avid MediaStream website in the support area at http://www.avid.com/onlinesupport/), or contact Avid MediaStream SupportSystems MediaStream Support.*

Installing or Upgrading MSS 8000 Server Software

This section covers the installation and upgrading of your server node's AMS operating system.

Open Telnet Session

Open a Console port telnet session on the MSi PC and login as `root`. To start a telnet session:

1. From the MSi Control Panel, right-click the server node icon and select Console.

Console Port Option

2. A telnet session will open. If there is nothing in the window, press Enter. If a login prompt is displayed, login as root. Otherwise, you should see the current directory's prompt, such as [root@<xxyy> /bvs].

Open Console Port Telnet Session

Setting Up Logging of Telnet Session

If you encounter difficulties or have questions about the process or procedures during upgrade, a telnet session log can provide information to Avid MediaStream Support that can be used to assist you. The Telnet client supplied with Windows 2000 does not support telnet session logging. To log telnet sessions, you will need to install a telnet client supplied by another vendor.

Several shareware telnet clients are available. Tera Term (Pro) is a free terminal and telnet client fully capable of logging telnet sessions. You can download it from this Web site:

http:/hp.vector.co.jp/authors/VA002416/teraterm.html

Backing Up Site Files

Site files specify a server node's configuration. These files include the bvsrc, hosts, rhosts, passwd, group and a number of audio and video configuration files. Backing up the site files ensures that in the event of a problem such as a Boot Disk failure, you can quickly restore a server to its configured operating mode.

To back up a server node's site files:

1. Open a MSS or console telnet session and login as root.

2. From the prompt, enter the command **sitefiles2file**

```
root@01 /bvs] sitefiles2file
Operator Name:

No operator name has been specified in the last 24 hours.

Please enter your name at the prompt below.  Your name is used to
    keep track of who is doing system administration on you
    Broadcast Video Server.  It will appear in the /bvs/syslog log file.

    Please enter your name: ekl

    This sitefiles save operation would overwrite the file  /tmp/sfiles.cpio.

     Is it ok to overwrite this file with the latest sitefiles? (y/n)(def=y):
```

3. If requested to enter your name, enter your name or initials.

4. When prompted if it is OK to overwrite the file /tmp/sfiles.cpio, press Enter.

   Wait for the process to complete (several minutes). When it is complete, the prompt displays:

   --->> sitefiles copied to '/tmp/sfiles.cpio':

   followed by the root prompt.

5. From the MSi main menu, select Setup > Site Files > Save Sitefiles from BVS to Console PC > Local Hard Disk.

6. When the following message appears, click OK:

```
Save Sitefiles to C:\Program Files\Hewlett-
Packard\Msi\data\servername.cpio?
```

where *servername* is your server node's name.

<Help Search Keywords>A message stating Is 'sitefiles2file' done? is displayed. Click Yes.

<Help Search Keywords>After the site files are saved successfully to the PC, a message is displayed. Click OK.

7. Insert a formatted CD-recordable disc into your MSi PC CDRW drive.

8. Drag and drop the *.cpio files in the directory C:\Program Files\Hewlett Packard\MSi\data onto the CD-recordable disc.

9. Remove the disc and label it Site Files <Server Hostname>. Date it and store it in a safe place.

Upgrading the Server Software

📄 *Refer to the current software upgrade instructions (posted on the Avid MediaStream SupportWeb site in the support area at www.pinnaclesys.com/support), or contact Avid MediaStream SupportSystems MediaStream Support.*

Restore the Site Files

To restore the site files:

1. Insert the CD with the site files into the MSi PC's drive.

2. Open the MSi application for the server.

3. From the MSi menu, select Setup > Restore Sitefiles to Server from Console PC > Local Disk. This command copies the site files (using ftp) from the MSi PC to the server.

4. From your telnet session, run the command file2sitefiles.

   This command will unzip the site files into its many configuration files and install the files in their proper place.

5. When the process is complete, upgrade the server software. (see note above).

6. The server upgrade procedure modifies the site files. Save the site files as described in *"Backing Up Site Files" on page 287*.

Chapter 12

VLAN and Fibre Channel Switch Configuration

The redundant Fibre Channel and VLAN switches in the System have been configured at the factory. If a switch fails and needs replacement, or if the configuration of a switch changes, you may need to reset the configuration settings for the switch. Both VLAN and Fibre Channel switches are configured via a command line interface that is accessed through a HyperTerminal session. To minimize the need for making numerous manual settings on the switches, Avid MediaStream Support provides pre-configured setup files for your switch. This chapter describes the procedures for configuring both VLAN and Fibre Channel switches for clusters in the MSS Networked Storage System. The following topics are covered:

- HP Procurve VLAN switch configuration
- Capellix 2000 and 3000 switch configuration

Before You Begin

Before you begin, you will need the following:

- A Windows configured PC (use the MSi PC)
- A 9-Pin null-modem cable for connection of the PC and the serial port on the VLAN and Fibre Channel switches

One of these cables ships with each VLAN switch.

- A tftp application
  (we recommend PumpKin tftp available on the web at
  http://www.klever.net/kin/pumpkin.html)

• The latest version of the MSS 8000 software for MSS Networked Storage System

HP Procurve Switch Configuration

Check Switch Status

Open a telnet session to each FSC. Run the command `checkLan`. This runs a a utility designed to check the connections from the specified device. Enter the required information after each prompt. The CheckLan utility will then ping all required devices on both VLAN switch and will report any communication errors encountered.

If errors are encountered, correct the fault before proceeding and verify correction by running the checkLan utility a second time.

Do not perform a switch upgrade or configuration until you have verified that both switches are performing normally. Failure to follow this precaution before switch configuration could cause components within your system to go off-air.

Prepare System for Download

Use the 9-pin null-modem cable to connect the PC to the HP Procurve switch.

Null-modem Cable Connections
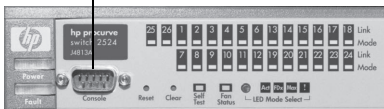
9-pin serial port

MSi serial port

Copy the Files to C:\Temp

The configuration files are on the MSS 8000 Software Release CD in the swt_cfg directory. To simplify the download procedure, copy the files you need for the procedure from the CD to the C:\temp directory on the MSi PC

Configuration Files Directory

```
⊟ 📁 swt_cfg
   ⊞ 📁 c2k
   ⊞ 📁 c3k
   ⊟ 📁 hp2512
      ├ 📁 cfg
      └ 📁 firmware
   ⊟ 📁 hp2524
      ├ 📁 cfg
      └ 📁 firmware
```
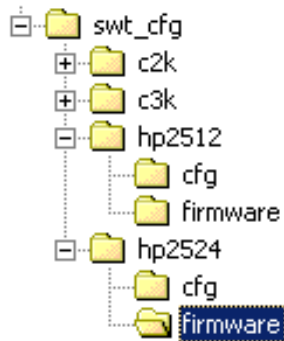
1. Open the directory for your switch (the 24-port VLAN switch is hp2524) to the two subfolders: cfg (configuration files) and firmware.

📋 *The cfg folder contains 32 configuration files, two for each of 16 clusters. The files should be labeled hp2524<#> followed by <a> or <b> e.g. `hp2524_01a` (switch 1 in cluster 1).*

2. Copy the configuration file(s) and the firmware file to C:\Temp.

Set Up a HyperTerminal Session on the PC

1. Go to Start Menu > Program > Accessories > Hyperterminal and Choose Hyperterminal from the menu. The Hyperterminal application will launch a session.

Connection Description Dialog Box

2. Enter a name in the connection description to save the connection for future use. Click OK.

Connection to Dialog Box

3. The *Connect To* dialog box is displayed. In the Connect using text entry box, click the arrow and select COM 2 from the pull-down list, and then click OK.

4. The *COM2 Properties* dialog box displays. Set the values to 38400 bps, 8 Data bits, Parity None, Stop bits 1, Flow control None. Click OK. The session will open.

COM2 Properties Dialog Box
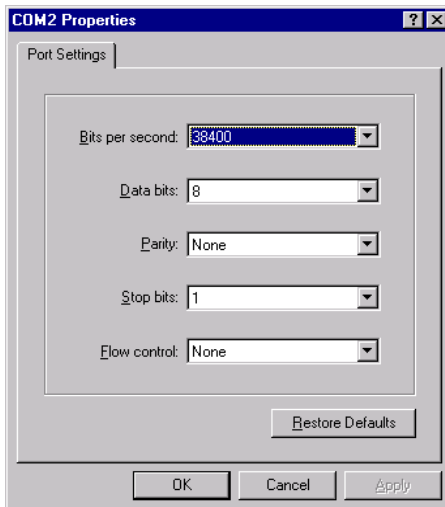
5. Click the Properties button on the tool bar. The switch Properties dialog box appears.

Switch Properties Dialog Box
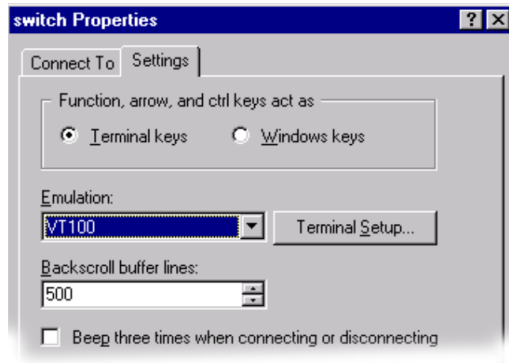
6. Click the Settings Tab, and set Emulation to VT100. Then click OK. The session now is ready to receive data from the switch.

HP Procurve Firmware Download

1. Power up the switch. Press Enter twice. You should see the boot sequence progress.

2. The switch will take about 30 seconds to initialize. See below

```
HP J4813A ProCurve Switch 2524

Firmware revision F.02.11
Copyright (C) 1991-1998 Hewlett-Packard Co.  All Rights Reserved.
          RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the Government is subject to restricti
set forth in subdivision (b) (3) (ii) of the Rights in Technical Data and
Computer Software clause at 52.227-7013.

          HEWLETT-PACKARD COMPANY, 3000 Hanover St., Palo Alto, CA 94303

```

3. Press the space bar. The prompt HP2524# will appear.

4. Enter menu. The Console Manager Mode's main menu will appear.

5.

```
=========================- CONSOLE - MANAGER MODE -===================

                              Main Menu
1. Status and Counters...
2. Switch Configuration...
3. Console Passwords...
4. Event Log
5. Command Line (CLI)
6. Reboot Switch
7. Download OS
8. Run Setup
9. Stacking...
10. Logout

Provides the menu to display configuration, status, and counters.


```

6. Press 1 to view the Status and Counters.

VLAN Switch Status and Counters Menu

```
=========================- CONSOLE - MANAGER MODE -===================

                         Status and Counters Menu

1. General System Information
2. Switch Management Address Information
3. Port Status
4. Port Counters
5. Address Table
6. Port Address Table
7. Spanning Tree Information

```

7. Press 1 to view General Information.

```
==========================- CONSOLE - MANAGER MODE -====================

                 Status and Counters - General System Information

System Contact     :
System Location    :              Currrent firmware
Firmware revision  : F.02.11   /Base MAC Addr : 0001e7-701d80
ROM Version        : F.01.01  /  Serial Number : tw05300761
Up Time            : 9 mins     Memory- Total : 11,337,704
CPU Util (%)       : 12          Free : 9,663,348

IP Mgmt  - Pkts Rx : 427        Packet   - Total : 512
            Pkts Tx : 0 Buffers         Free   : 510
                                        Lowest  : 329
```

If the firmware version is not F.02.11, you need to download more recent firmware.

8. Press Enter to go to previous menu. Press 0 to return to the main menu. If the correct firmware is installed, go to the "Downloading the Configuration Files" on page 297.

9. Press 7 to begin Download OS.

```
==========================- CONSOLE - MANAGER MODE -
=======================
          Download method
                                 Download OS
Current Firmware revision : F.02.11

Method [XMODEM] : TFTP.
TFTP Server
Remote File Name :

Actions->  Cancel    Edit     eXecute    Help
Select the file transfer method (TFTP and XMODEM are currently supported).
```

10. TFTP is the displayed method. Press the space bar to select XMODEM.

11. Press Enter. A *C* should display on the screen. Press Enter until the C displays.

Select Send File
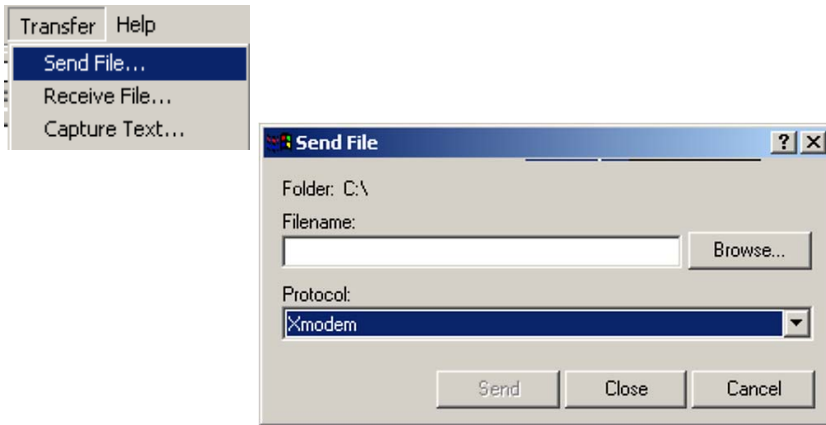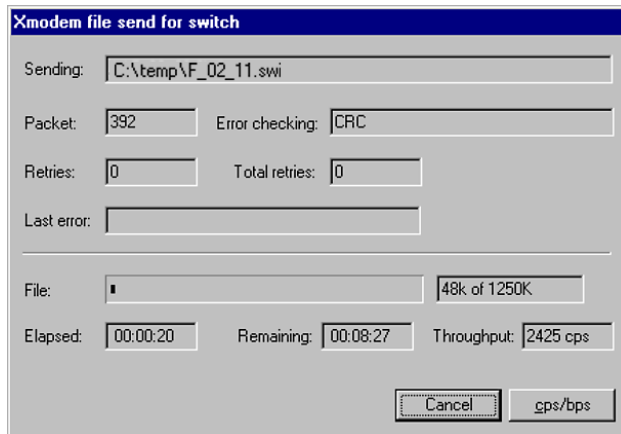
12. On the HyperTerminal menu bar, select Transfer > Send File. The Send File dialog box displays. Select Xmodem from the Protocol list.

13. Click Browse and go to the directory where the files are located (C:\temp). Select F_02_11.SWI. (See Figure 12-9.) Double-clicking the file selects it for sending.

Send File
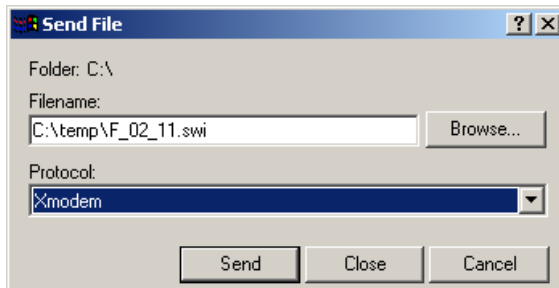
14. Click the Send Button. The *Xmodem file send for switch* dialog box displays. After a few seconds, the progress indicator should show activity. The download process takes about 20 minutes. When the download is finished, the switch automatically reboots.

XModem File Send for Switch

15. To verify the download has completed, wait for the switch to reboot. Enter `menu` at the prompt.

16. Press `1` for Status and Counters. Then press `1` for General System Information. The software version should be Firmware revision F.02.11.

17. Press Enter to return to the previous menu, and press 0 to return to the main menu.

Downloading the Configuration Files

To download the configuration files for the switch:

1. From the main menu, press 5 to enter the Command Line (CLI) mode.

2. At the prompt enter: `copy xmodem startup-config pc`

3. Press `y` when asked if you want to continue.

4. Press Enter again to begin the XMODEM transfer.

5. When a capital *C* is displayed, go to the HyperTerminal menu bar and select Transfer > Send File.

6. The Send File dialog box is displayed. Click the Browse button and navigate to the correct directory and select the correct file for your switch. The files should be labeled with the number corresponding to the cluster of your system and an <a> or <b> (for example, hp2512_01a or hp2512_01b).

Select File To Send Dialog Box
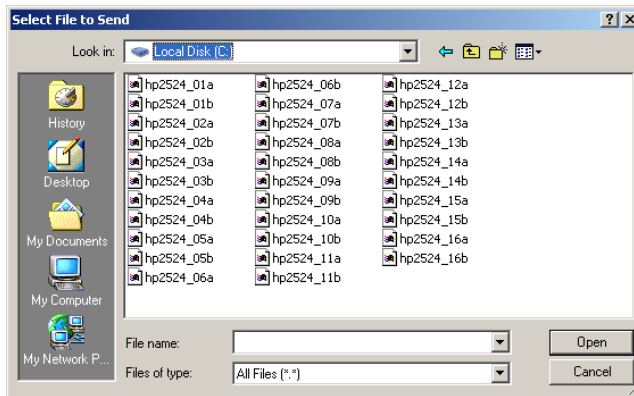
7. Double-click the file to select it for sending. The *Xmodem file to send* dialog box is displayed.

📖 *There are two groups of configuration files (each with 32 configuration files): hp2524 is for the 24-port switch, and hp2512 is for the 12-port switch.*

8. Press the Send button. The transfer should complete in seconds. When the transfer is complete, the switch reboots automatically. When it comes back up, press Enter twice. The return prompt will change from HP2524# to switch<id>#.

Check the LAN Settings Configuration

📖 *This step is necessary only if you are having trouble with switch communication.*

1. Verify that the prompt indication reflects the correct switch number i.e. switch01a for switch 1 Cluster 1.

2. At the prompt, enter **menu.**

3. From the main menu, press **2 -** Switch Configuration.

4. Press **5 -** IP Configuration.

5. Confirm that the Default Gateway is set to 10.xx.21.32 (switch A) or 10.xx.17.33 (switch B).

📖 *See Table on page 300 for the correct VLAN address.*

```
                 Switch Configuration - Internet (IP) Service

   Default Gateway : 10.64.21.32
   Default TTL     : 64

   VLAN          IP Config     IP Address        Subnet Mask
----------- + ---------   ---------------   ---------------
   vlan1013     | Disabled
   vlan1014     | Disable
   vlan1015     | Disabled
   vlan1016     | Manual       10.64.16.34       255.255.255.0
   vlan1017     | Disabled
   Actions->  Cancel     Edit     Save      Help
   Enter the IP address of the default gateway.
```

Default Gateway address 10.xx.16.3<x><yy>
corresponds to cluster address

```
                Switch Configuration - Internet (IP) Service


   Default Gateway : 10.64.21.32
   Default TTL     : 64



     VLAN          IP Config     IP Address        Subnet Mask

  ----------- + ---------   ---------------   --------------
   vlan1013     | Disabled
   vlan1014     | Disabled
   vlan1015     | Disabled
   vlan1016     | Manual       10.64.16.34       255.255.255.0
   vlan1017     | Disabled



 Actions->   Cancel      Edit      Save      Help

Enter the IP address of the default gateway.
```

Default Gateway address will be
10.xx.16.3(x).<yy> corresponds
to cluster addressing

Subnet mask is 255.255.255.0

Switch 1 VLAN IP address is
10.xx.16.33 on VLAN<xx> 16
Switch 2 VLAN IP address is
10.xx.1735 on VLAN<xx>17

Note: <xx> = cluster ID

Press E for edit. Then press the down cursor arrow until vlan <xx>16 is displayed.

(<xx> corresponds to Cluster ID number). Check the settings. The settings should be:

VLAN IP Address Settings

Switch	VLAN	IP Config	IP Address	Subnet Mask
A (Primary)	vlan <xx>16	Manual	10.xx.16.34	255.255.255.0
B (Secondary)	vlan <xx>17	Manual	10.xx.17.35	255.255.255.0

6. When you have confirmed these settings, press Enter to leave the edit mode and press C to leave the configuration. Press 0 to return to the main menu.

7. Press "5" to return to the Command Line Interface.

VLAN IP Configuration Table

VLAN Configuration Table

Cluster Number	Switch Name	VLAN Name	Switch IP Address	Subnet Mask	Default Gateway
Cluster 1	switch01a	vlan116	10.64.21.34	255.255.255.0	10.64.21.32
	switch01b	vlan116	10.64.17.35	255.255.255.0	10.64.17.33
Cluster 2	switch02a	vlan216	10.65.21.34	255.255.255.0	10.65.21.32
	switch02b	vlan216	10.65.17.35	255.255.255.0	10.65.17.33
Cluster 3	switch03a	vlan316	10.66.21.34	255.255.255.0	10.66.21.32
	switch03b	vlan316	10.66.17.35	255.255.255.0	10.66.17.33
Cluster 4	switch04a	vlan416	10.67.21.34	255.255.255.0	10.67.21.32
	switch04b	vlan416	10.67.17.35	255.255.255.0	10.67.17.33
Cluster 5	switch05a	vlan516	10.68.21.34	255.255.255.0	10.68.21.32
	switch05b	vlan516	10.68.17.35	255.255.255.0	10.68.17.33
Cluster 6	switch06a	vlan616	10.69.21.34	255.255.255.0	10.69.21.32
	switch06b	vlan616	10.69.17.35	255.255.255.0	10.69.17.33
Cluster 7	switch07a	vlan716	10.70.21.34	255.255.255.0	10.70.21.32
	switch07b	vlan716	10.70.17.35	255.255.255.0	10.70.17.33
Cluster 8	switch08a	vlan816	10.71.21.34	255.255.255.0	10.71.21.32

VLAN Configuration Table

Cluster Number	Switch Name	VLAN Name	Switch IP Address	Subnet Mask	Default Gateway
	switch08b	vlan816	10.71.17.35	255.255.255.0	10.71.17.33
Cluster 9	switch09a	vlan916	10.72.21.34	255.255.255.0	10.72.21.32
	switch09b	vlan916	10.72.17.35	255.255.255.0	10.72.17.33
Cluster 10	switch10a	vlan1016	10.73.21.34	255.255.255.0	10.73.21.32
	switch10b	vlan1016	10.73.17.35	255.255.255.0	10.73.17.33
Cluster 11	switch11a	vlan1116	10.74.21.34	255.255.255.0	10.74.21.32
	switch11b	vlan1116	10.74.17.35	255.255.255.0	10.74.17.33
Cluster 12	switch12a	vlan1216	10.75.21.34	255.255.255.0	10.75.21.32
	switch12b	vlan1216	10.75.17.35	255.255.255.0	10.75.17.33
Cluster 13	switch13a	vlan1316	10.76.21.34	255.255.255.0	10.76.21.32
	switch13b	vlan1316	10.76.17.35	255.255.255.0	10.76.17.33
Cluster 14	switch14a	vlan1416	10.77.21.34	255.255.255.0	10.77.21.32
	switch14b	vlan1416	10.77.17.35	255.255.255.0	10.77.17.33
Cluster 15	switch15a	vlan1516	10.78.21.34	255.255.255.0	10.78.21.32
	switch15b	vlan1516	10.78.17.35	255.255.255.0	10.78.17.33
Cluster 16	switch16a	vlan1616	10.79.21.34	255.255.255.0	10.79.21.32
	switch16b	vlan1616	10.79.17.35	255.255.255.0	10.79.17.33

📄 *If your site has more than 16 clusters, contact Avid MediaStream Support for configuration assistance.*

VLAN name is the name of the VLAN port that is configured under the switch configuration menu.

Gadzoox Capellix Switch Configuration

Verify Fibre Channel Switch Status

From the MSi System Status window, verify that both Fibre Channel paths are operational.

1. Check the System Status button. If it is green, then the Fibre Channel Paths are functioning.

2. If the System Status button is red, verify which component failed. Both controllers on each array should be green (that is, it is OK) to proceed. If any controllers are not operational from any server node, locate the problem and correct it before proceeding.

Status must be checked from the MSi PC for each server node. To do this, quit each MSi session and start the next one. Performed sequentially from each server node in the system.

Do not perform a switch upgrade or configuration until you have verified that both Fibre Channel switches are performing normally. Not following this precaution before proceeding with upgrade could cause components within your system to go off-air.

Prepare System for Download

PumpKin Files

Loading the configuration files on the Capellix Fibre Channel Switches requires that your PC has a TFTP server available. This procedure uses PumpKin TFTP. If you need a copy of this application, it can be downloaded at no charge from:

http://www.klever.net/kin/pumpkin.html

PumpKin is a program designed to send and receive files over the net while having Wintalk session running using TFTP (RFC1350) protocol. It includes full-functional TFTP server/client so it may be useful for maintaining Cisco routers, Versanet ISP accelerators and probably some other network devices.

This software is free for use and distribution as long as developers' credits are explicitly mentioned.

Developed by: Klever Group, Inc. (http://www.klever.net/)
Author: Michael Krelin (hacker@klever.net)
Copyright 1997,1998 Klever Group, Inc.
Fan mail send to gefilte@klever.net

If you have any questions about configuration using PumpKin TFTP, contact Avid MediaStream Support.

To prepare the switch for download:

1. Install the PumpKin TFTP on your PC. Place the three files
   in a directory on the C drive and label the directory PumpKin.

2. Use the 9-pin null-modem cable to connect the PC to the Capellix switch.

Null-Modem Cable Connections

9-pin serial port   MSi serial port

Copy the Firmware and Configuration Files

The firmware and configuration files are on the MSS8000 software release CD in the
swt_cfg directory.

1. From this directory go to the folder labeled c2k for the Capellix 2000 switch,
   or c3k for the Capellix 3000 with 12-port blades. (For the Capellix 3000 with 8-port
   blades, go to the folder labeled 8portBlade within c3k.)

2. Within this directory are two sub-directories – fw and config. Copy the contents of both
   directories into C:\Temp on the MSi PC.

Sample of Files to be Copied

Name	Size	Type
FW2000GX0130G02.bin	2,705 KB	BIN File
c2k11p.dal	65 KB	DAL File
c2k11p.dsi	65 KB	DSI File
c2k11p.prt	65 KB	PRT File
c2k11p.zne	65 KB	ZNE File

Temp
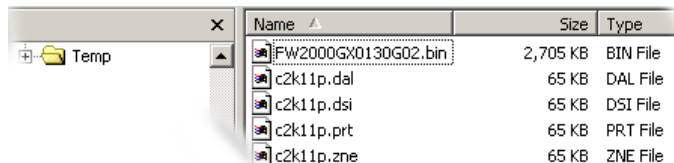
Setup HyperTerminal Session on the PC

1. Go to Start Menu > Program > Accessories > HyperTerminal > HyperTerminal.
   The HyperTerminal application will launch a session.

2. Type a name in the connection description, then click OK.

3. The Connect To dialog box is displayed. For the *Connect using* option, select COM2, and click OK.

4. The COM2 Properties dialog box displays. Set to 38400 bps, 8 Data bits, Parity None, Stop bits 1, Flow control None. Click OK. The session opens.

COM 2 Properties Dialog Box
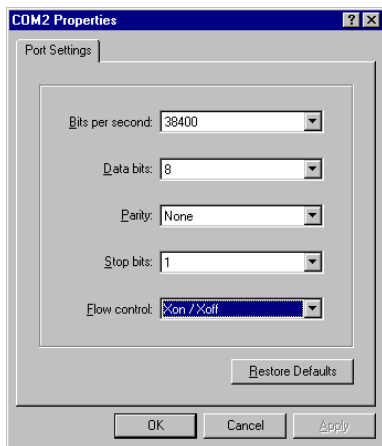
5. Click the Properties button on the tool bar. The Switch Settings dialog box will appear. Click the Settings Tab, and set Emulation to VT100. Then click OK.

Set Up the TFTP Program

1. Start PumpKIN.exe on the MSi PC. The program window will open and display *PumpKIN started* in the message area of the window.

PumpKIN Window
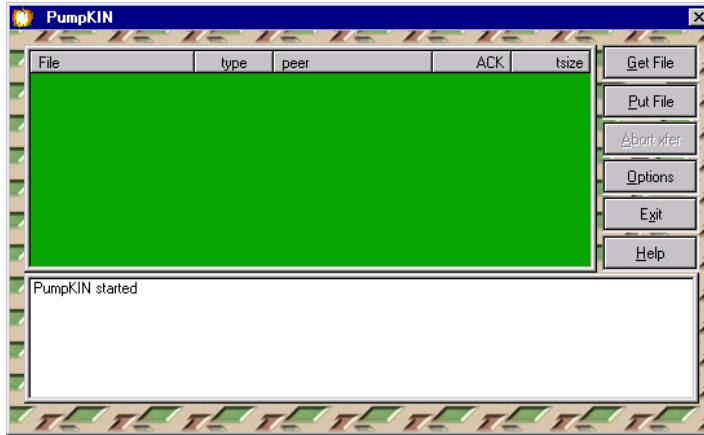
2. Click the Options button. The Options dialog box opens. Do the following:

   - Select Give all files

   - Select Take all files

   - Set TFTP filesystem root (download path) to C:\Temp.

   - Click OK to accept changes.

Options Dialog Box
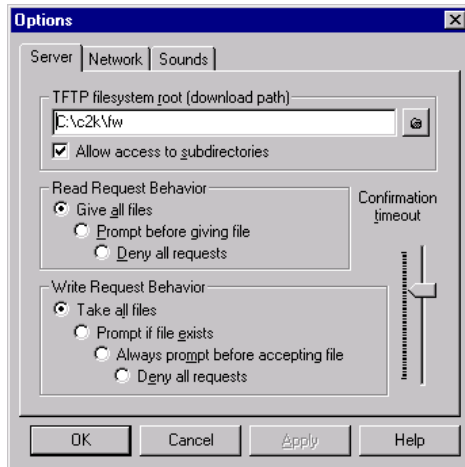
3. Leave PumpKIN open on the desktop so that it can accept your TFTP download process.

Set Up Ethernet Connection

The Capellix switches are connected to the VLAN switches. The Primary FC Switch is connected to VLAN A. The Secondary FS Switch is connected to VLAN B. The switch addresses are 10.xx.21.36 for Primary and 10.xx.17.37 for Secondary. See "VLAN Topology" on page 51. No additional connections need to be made for downloading files to the switches.

Set Up the Capellix for Download

1. From your HyperTerminal session reset the switch (remove and reinsert the power cable). Reboot takes about one minute.

2. When the boot up is completed, logon as user and enter ADMIN (all caps) for the password.

3. Enter 2 to check Networking parameters.

```
Capellix 2000C Stackable SAN Switch

Model Number:            Model 2000C
Ventana SANtools GX:     01.30-G02
Selftest Status:         passed

2. Networking parameters
3. Management options
4. Command line interface
5. Logout
6. Reset switch
```

4. Verify the IP and subnetwork mask settings. The IP address should be 10.xx.21.36 for the primary switch and 10.<xx>.17.37 for the Secondary switch where <xx> is the cluster ID. See *Chapter 3: VLAN Topology* for information on VLAN Addresses.

```
1. Return to main menu
2. Set IP address      [current: 127.0.0.1]
3. Set subnetwork mask [current: 0.0.0.0]
4. Set gateway address [current: 0.0.0.0]
5. Save modifications and reset switch to activate
> 2
```

5. If the IP address is correct, enter 2 to return to the main menu. Then enter the Command Line interface and download the firmware (next section).

6. If the IP address is not correct, enter 2. Then enter the new IP address at the prompt and enter 2 to return to the previous menu.

7. Change the Switch subnet mask by pressing 3.

8. Enter 255.255.255.0. Press 1 to return to the previous menu.

9. Press 5 to save your changes. When settings have been saved, press 1 to return to the main menu:

10. Press 6 to reset the switch. Press y to reboot with the new parameters.

11. When the switch boots up, logon as user and enter ADMIN for password.

12. Press 4 to open the command-line interface. The prompt changes to cmd>.

Download Firmware

1. At the command prompt enter **`tftpdl`**.

```
cmd> tftpdl

TFTP download file name:    FW2000GX0130G02.bin
TFTP boot file name:        FA2000GX0130G02.bin
TFTP IP address:            10.64.21.5
Request time out:           5000 ms
Request number of retries:  24
Data time out:              500 ms
Data number of retries:     90
```

The return value will provide the TFTP download file name, the TFTP boot file name, and the TFTP IP address. The following values should be present:

:

Name	Capellix 2000	Capellix 3000
TFTP download file name	FW2000GX0130G02.bin	FW3000GX0140G08.bin
TFTP boot file name	FA2000GX0130G02.bin	FA3000GX0140G08.bin
TFTP IP address (Primary)	10. xx.21.5	10.xx.21.5
TFTP IP address (Secondary)	10. xx.17.5	10.xx.17.5

2. Edit the values as required to conform to the table above.

   - To change the download file name, enter: **`tftpdl dfile = <filename`>**

   - To change the boot file name, enter: **`tftpdl bfile = <filename>`**

   - To change the TFTP IP address, enter:**`tftpdl ip = <10.xx.21.5>`** (Primary) or: **`tftpdl ip = <10.xx.17.5>`** (Secondary)

   - Enter **`tftpdl`** start to begin the download process. PumpKIN TFTP will also show the progress of the download process.

Download will continue until complete. The progress of the download will display in the green display window of PumpKIN, with the ACK column showing the progress of the download. As long as this continues to advance, the download is proceeding normally. Firmware takes a minute or two to completely download.

When the transfer is completed, the progress indicator no longer appears in the top green window, and a message indicating a successful completion displays.

PumpKIN Download Complete

```
PumpKIN started
'FW2000GX0130G02.bin' of type 'octet' is requested from 10.73.17.100
Transfer of 'FW2000GX0130G02.bin' has successfully completed
```
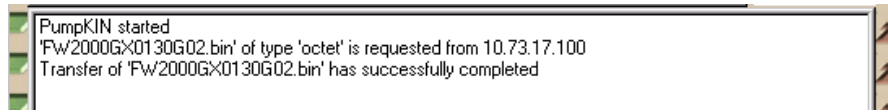
3. On the HyperTerminal window, the boot sequence will continue with the loading of the newly transferred firmware and finish with a boot to the login prompt.

4. Enter **user** (lower case) at the Login prompt.

5. Enter **ADMIN** (upper case) at the Password prompt. (If the screen shown below does not appear, then enter **exit** to quit the Command Line Interface.)

📑 *If for any reason your download file was corrupted, and the switch is temporarily non-operational, repeat the download process.*

Troubleshooting

If after attempting to download firmware, you receive the following message:

Download failed. Ret=2 Failed to read package header from tftp server

Perform the following troubleshooting steps:

1. The TFTP server window indicates a GET request; check the spelling of the file name and the path on the tftp server.

2. The TFTP server window has no contact indications; check your network settings and connections.

> If you are still unable to upgrade your switch, contact Gadzooks Networks Customer Service Organization:

> Telephone: 888 423-3222 or 408 360-4990

> Fax: 408 360-4951

> E-mail: tech.support@gadzoox.com

Downloading the Configuration Files

The switch should have successfully booted up with the new firmware. After logon, the prompt displays the five options for further settings. Press 4 to enter the command-line interface from which you can download the configuration files.

1. At the cmd> prompt enter one of the following:

[Primary] **config ip = 10.xx.21.5**

[Secondary] **`config ip = 10.xx.17.5`**

> *These are the correct addresses for the FC switches to your MSi PC. See "VLAN Topology" on page 51 to find the correct MSi VLAN address for your cluster.*

2. Enter **`config file = c2k11p`**.

> *This is the prefix for the four configuration files in C:\Temp.*

3. Enter **`config restore`**.

4. Press **`y`** to start the download. The file transfer's progress displays.

```
Restoring DAL configuration file
Restoring ZONE configuration file
Restoring ZONE PORT configuration file
Restoring DSI configuration file
Activating restored zoning & zone port configuration
Configuration files were restored properly
cmd
```

File Transfer Successful

The tftp server should note the transfer in the lower window.

5. Enter **`exit`** to leave the command-line interface.

6. Press **`6`** to reset the switch. The switch will boot with the updated switch settings.

7. Quit HyperTerminal and the TFTP application.

8. Remove the 9-pin connection and replace VLAN connections as necessary. The switch is ready for operation and should boot correctly with the new settings when turned on.

Brocade SilkWorm Switch Configuration

These switches should already have the proper firmware and configuration information on them when they are installed. To log in to the switch for verification or troubleshooting, do the following:

1. Connect an RS-232 cable with a DB9-to-RJ45 adaptor to the 9-pin DIN connector on the Brocade switch. Connect the other end of the cable to the COM1 port on the MSi PC (or other PC used for setup or testing purposes).

2. On that PC, start the Hyperterminal application (usually via Start > Programs > Accessories > Communications > Hyperterminal), with the following options: 9600 baud, 8 bits, no parity, one stop bit, no flow control. Make sure that Scroll Lock is disabled on the PC keyboard.

3. If necessary, power up the Brocade switch and wait for it to boot to the login screen. (This may take 4-6 minutes.)

```
POST2: Test #1 - Running camtest
POST2: Test #2 - Running txdpath
POST2: Test #3 - Running spinsilk (SERDES)
POST2: Test #4 - Running backplanetest
POST2: Running diagshow
POST2: Script PASSED with exit status of 0 Mon Dec 20 18:28:28 UTC 2004
1:27)
Initializing Ports ....
Port Initialization Completed
Enabling switch...
0x25b (fabos):  Switch: 0, Info FABRIC-SWITCH_ROLE, 4, Principal switch
0x25b (fabos):  Switch: 0, Info FABRIC-DOMAIN_INFO, 4, Domain 1
```

4. Make sure the switch displays "Script PASSED" during the boot process, as shown here. If it does not, contact Avid MediaStream Support. Otherwise, press Enter to continue the login.

```
Fabric OS (swd77)

swd77 console login:
```

5. Log in as user "admin" with password "password".

You can now verify configuration information for the switch.

IP Address

Type `ipAddrShow` at the prompt to see the switch IP address information.

```
swd77:admin> ipAddrShow
Ethernet IP Address [10.64.21.36]:
Ethernet Subnetmask [255.255.255.0]:
Fibre Channel IP Address [0.0.0.0]:
Fibre Channel Subnetmask [0.0.0.0]:
Gateway IP Address [10.64.21.32]:
```

The Ethernet IP address should be 10.*xx*.21.36 for FC switch A and 10.*xx*.17.37 for FC B, where *xx* maps to the cluster number, starting at 64 for cluster 1.

The subnet masks and Fibre Channel IP address should be as shown here for both FC switches.

The Gateway IP address should be 10.*xx*.21.32 for FC switch A and 10.*xx*.17.32 for FC B, where *xx* maps to the cluster number, starting at 64 for cluster 1.

Firmware Revision

Type `firmwareShow` at the prompt to see the switch firmware information.

```
swd77:admin> firmwareShow
Primary partition:     v4.2.2a
Secondary Partition:   v4.2.2a
```

Configuration

Type **switchShow** at the prompt to see the switch port configuration information.

Here is the expected output for the Brocade 3850 (16-port) switch used with the Medea 1 GB drive array:

```
Ports of Slot 0    0  1  2  3    4  5  6  7    8  9 10 11   12 13 14 15
-----------------+--+--+--+--+----+--+--+--+----+--+--+--+----+--+--+--
Speed             1G 1G 1G 1G   1G 1G 1G 1G   1G 1G 1G 1G   1G 1G 1G 1G
Trunk Port        ON ON ON ON   ON ON ON ON   ON ON ON ON   ON ON ON ON
Long Distance     .. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
VC Link Init      .. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
Locked L_Port     .. .. .. ..   .. .. .. ..   ON ON ON ON   ON ON ON ON
Locked G_Port     .. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
Disabled E_Port   .. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
ISL R_RDY Mode    .. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
Persistent Disable.. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
Locked Loop HD    .. .. .. ..   .. .. .. ..   .. .. .. ..   .. .. .. ..
```

Here is the expected output for the Brocade 3250 (8-port) switch used with the Medea 1 GB drive array:

```
Ports of Slot 0    0  1  2  3    4  5  6  7
-----------------+--+--+--+--+----+--+--+--
Speed             1G 1G 1G 1G   1G 1G 1G 1G
Trunk Port        ON ON ON ON   ON ON ON ON
Long Distance     .. .. .. ..   .. .. .. ..
VC Link Init      .. .. .. ..   .. .. .. ..
Locked L_Port     .. .. .. ..   ON ON ON ON
Locked G_Port     .. .. .. ..   .. .. .. ..
Disabled E_Port   .. .. .. ..   .. .. .. ..
ISL R_RDY Mode    .. .. .. ..   .. .. .. ..
Persistent Disable.. .. .. ..   .. .. .. ..
Locked Loop HD    .. .. .. ..   .. .. .. ..
```

If any of this output does not match what is expected, contact Avid MediaStream Support.
For Brocade switch cabling information, see Chapter 5.

Chapter 13
Troubleshooting Resources

The chapter presents resources for maintaining and troubleshooting the MediaStream System. The following topics are covered:

Support Resources

- Online Manuals
- Telnet Logs
- FTP
- Redirecting Output To File

Tools for FSC Administration

- Error Logs
    - fsc.log
    - syslog
    - solmsg.out log
    - FSC Utilities
    - fsc_status
    - fsc_copy
    - fs_ls
    - fs_util
    - fs_dump_meta
- Troubleshooting Database Problems

Tools for Server Node Administration

- Error Logs
    - elog
    - Syslog
- Server Node Utilities
    - revisions
    - mdsutil
    - vmescan
    - sand_state –s
    - san_checkLan

Tools for ConnectPlus 1000 Networked Storage Gateway PC Administration

- Error Logs

Support Resources

In addition to Avid MediaStream SupportSystems Broadcast Support, this manual is a primary support resource. It is periodically updated and is available online at www.pinnaclesys.com/support/. Other support resources are available on the MSS 8000 server node and can be accessed via FTP. The server logs and the output of telnet sessions will prove to aid you as well. To help you troubleshoot your system, this section covers the following support tools:

- Using FTP
- Logging telnet sessions
- File redirection to save output to text

Using FTP

You can transfer files between components via FTP (File Transfer Protocol). For example, you can use FTP to copy log file data from the server to the MSi PC to be printed or e-mailed to Avid MediaStream Support for analysis.

To open an FTP session:

1. From the Start menu, select Run, and enter cmd.
2. At the DOS prompt, enter **ftp <hostname>** of the server. The system responds:

```
Connected to <hostname>.
220 <hostname> FTP server (Version 6.00) ready.
User (<hostname>: (none)):
```

3. At the user prompt, enter `ftp`.

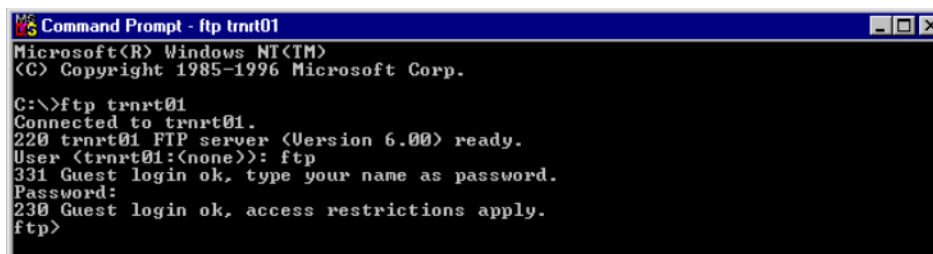4. For the password, enter `ftp` and press Enter. The system responds:

```
230 Guest login ok, access restrictions apply.

ftp>
```

FTP Logon Window

Copying Files with FTP

FTP allows you to copy files between servers and from the server to the MSi PC. Save the files to a destination folder on the MSi PC's local disk and then copy the files to a writable CD (see "Saving Site Files" on page 164).

Open an ftp session

1. Open an ftp session and logon (see the logon instructions above).

   To see which options are available in ftp, enter a question mark (?) at the ftp prompt. This returns a list of command options you can in your ftp session. The most common command is `get`. The `get` command followed by a filename executes a file transfer. The `put` command allows you to move a file from your local directory to the destination directory. The `mget` command allows you to copy multiple files at once without having to request each file individually.

FTP Session with Help Screen

```
ftp> ?
Commands may be abbreviated.   Commands are:

!                delete         literal        prompt        send
?                debug          ls             put           status
append           dir            mdelete        pwd           trace
ascii            disconnect     mdir           quit          type
bell             get            mget           quote         user
binary           glob           mkdir          recv          verbose
bye              hash           mls            remotehelp
cd               help           mput           rename
close            lcd            open           rmdir
ftp> ascii
200 Type set to A.
ftp> prompt
Interactive mode Off.
ftp> mget *_
```

To copy files:

1. In the command prompt window, change to the directory from which you will copy files by entering cd <directory path>. To confirm your current directory, enter **pwd.**

2. Enter **ascii** to set the mode to ASCII (A) mode, which is used to copy ASCII text documents.

3. Set local directory on the MSi PC. At the prompt, enter **lcd c:\<directory path>**

4. Enter **prompt** to turn off interactive mode. If you enter prompt again, interactive mode is turned on. Interactive mode requests a keyboard y or n response for each file transfer. Perform this transfer with interactive mode off.

5. The verbose command lists files as the transfer occurs. (This is a toggle command similar as is the prompt command.) Verbose is set to on by default.

6. Enter **mget *.**

   The wildcard * (asterisk) symbol returns all files in the directory.

FTP File Transfer with Verbose Mode Set On


```
150 Opening ASCII mode data connection for 'turnon_743.dir' (qd bytes).
226 Transfer complete.
9992 bytes received in 1.46 seconds (6.83 Kbytes/sec)
200 PORT command successful.
150 Opening ASCII mode data connection for 'up_restore.dir' (qd bytes).
226 Transfer complete.
1227 bytes received in 1.03 seconds (1.19 Kbytes/sec)
200 PORT command successful.
150 Opening ASCII mode data connection for 'upgrade.dir' (qd bytes).
226 Transfer complete.
3947 bytes received in 1.02 seconds (3.87 Kbytes/sec)
200 PORT command successful.
150 Opening ASCII mode data connection for 'versions.dir' (qd bytes).
226 Transfer complete.
1033 bytes received in 0.63 seconds (1.64 Kbytes/sec)
ftp>
```

When all transfers are complete, the ftp> prompt displays. PDF files are binary so they should not be copied in ASCII mode. Enter binary. The response is:

Enter set to **I**.

1. Enter `mget *.pdf`.

   The asterisk (*) is a wildcard that searches for all files that include a .pdf extension. Entering this command will begin file transfer of the files within the .pdf extension files. There are two PDF files in the /bvs/doc directory.

7. When complete, enter ascii to return to ASCII mode.

Logging Telnet Sessions

It is often useful to preserve the screen output for future examination or to send to Avid MediaStream Support for review. telnet sessions can be saved for later review with the Start Logging function.

Windows 2000 Telnet client does not support logging. To log telnet sessions, you must use a third party telnet client. Several are available as shareware on the Web Tera Term Pro version 2.3 for Windows 95/NT, which is available at:

http://hp.vector.co.jp/authors/VA002416/teraterm.html

To view a log file:

1. From My Computer or Explorer, navigate to the log file directory.

2. Double-click the file to open it. The file will open in Notepad.

File Redirection

In UNIX, output can be redirected to a file that you can print out. You can use the redirect file command when you want to save the output of a command.

To redirect output, enter the command followed by the greater than (>) symbol and the directory path and file name. For example:

```
fs_ls -l > /fsc/doc/fs_ls.txt
```

The output is written to the designated text file.

This section reviews the FSC log files and key commands used to monitor and maintain system storage from the FSCs.

Error Log Files

The File System Controllers produce three log files for troubleshooting:

- syslog.txt
- fsc.log
- solmsg.out

syslog.txt

The syslog.txt file records major events during bootup or shutdown of the FSC. Information contained in the file might be linked to other log files to provide key information to a system problem. Syslog.txt is stored in the /fsc/logs directory. To view recent entries in the syslog, open a telnet session on the FSC you wish to monitor. Then enter:

```
tail -20 /fsc/logs/syslog.txt
```

This will open the last 20 lines of the syslog file.

fsc.log File

The fsc.log file resides in /fsc/logs directory. The file name is fsc.log.0x where <x> is the last character of the FSCs hostname (1 for Primary or 2 for Secondary)

fsc0101 = fsc.log.01

fsc0102 = fsc.log.02

The fsc.log can also be read using tail, vi or the more command. Locate the file in /bvs/tmp, and enter ls to verify the files name and location. To see the last 20 lines in the file, enter:

tail –20 fsc.log.0x

The fsc.log file can be dynamically accessed by enter the command tlog. In this mode, the log updates automatically as new error states are introduced. Begin a telnet session and log into the FSC as root or administrator. Then enter **tlog.** Press Ctrl+C to exit. When asked if you want to terminate the batch job, press Y.

Using tlog with an on-air System can potentially bring the System off-air.

If the eLog file is too large, or if you want to start monitoring the System with a clean log, enter **clearlog**. This command will move the contents of the **fsc.log.xx** to **fsc.log.xx.old**. The new **fsc.log.xx** will start out empty, and will fill as the System records new errors.

solmsg.out

The solmsg.out file records major events during bootup or shutdown of the Solid Database. Information contained in the file might be linked to other log files to provide key information to a system problem. solmsg.out is stored in the /solidDB directory. To view recent entries in solmsg.out, open a telnet session on the FSC you wish to monitor. Then enter:

tail -20 /solidDB/solmsg.out

This will open the last 20 lines of solmsg.out.

Sending Logs to Avid MediaStream Support

A copy of any log file can be recovered from the FSC via ftp. Copy the file to a floppy diskette. The file can then be attached to an e-mail and sent to mss_support@pinnaclesys.com.

Useful Troubleshooting Commands

fsc_status

The fsc_status utility is the most important utility for administering the File System Controller. Use this command to ascertain the status and health of both FSCs. Both FSCs should be in the Ready, ok state. Make sure, Database, SanService, and Watchdog are running on both FSCs.

```
FSC Status
Tue 10/30/2001 10:56:43.70


            Local Host                Remote Host
Hostname    FSC1001.pcle.com          fsc1002-22
IP          127.0.0.1                 10.73.22.2

APPLICATIONS

   Database      running                  running
   SanService    running                  running
   Watchdog      running                  running

DATABASE
   TCP Port      1315                     1325
   Role          PRIMARY                  SECONDARY
   Connection    CONNECTED                CONNECTED
   Remote DB     tcp 10.73.22.02 1325     tcp 10.73.22.01 1315
   Operations    14526                    14526
   Date          10/30/2001               10/30/2001
   Time          10:56a                   10:48a
   Size          16,007,168               16,007,168

SANSERVICE

   Status        Ready                    Ready

WATCHDOG

Status        ok                         ok

HSB STATUS REPORT 127.0.0.1
   This is a Hot Standby primary server.
   Connected to secondary 'tcp 10.73.22.02 1325'
   HotStandby log size 0 bytes
   Replicated 6996 transactions

HSB STATUS REPORT 10.73.22.2

   This is a Hot Standby secondary server.
   Replicated 6996 transactions
```

fsc_copy

This command overwrites the remote database with the local database. This command can be dangerous, as it will force the overwrite of a database and could replace a functioning database with one that is less accurate. To protect against this happening, the command can be run only when the local database is in the Primary Alone mode.

⚡ **Extreme care should be exercised when using fsc_copy. If you are unsure about whether to use this command and under what conditions, contact Avid MediaStream Support for advice.**

fs_ls

The fs_ls command will provide a list of content stored and available on the storage system. The report will begin with a list of total files as well as total disk space, free space and available space. The command fs_ls provides a simple listing of file names, while adding the command flag -l will provide a more detailed report of the content. For example, fs_ls -l provides the following data:

File Name	File Size	Bitr ate	MPEG Codin g	GOP Structu re	Video Standa rd	Disk Set #	Delete Protec t	File Clean Status	File Create Date/Time
File	Size	Mbs	Prf	Gop	Std	S	D	ok	Create Time
A10000 01.std	75497472	20	422	IBP	NTSC	0	0	Y	Oct 30 10:29:03 2001

An example of output from the fs_ls -l command follows:

```
FSC Server: fsc1001 [FSC READY,Primary,HSB Connected]

Total Files: 126
TotalDiskSpace = 544.53 GBFreeSpace = 539.26 GBAvailSpace = 539.25
GBDiskSet: 0  Total = 544.53 GB Free = 539.26 GB Avail = 539.25 GB
File             Size          Mbs Prf Gop Std  S  D ok Create Time
A1000001.std   75497472 20   422 IBP NTSC 0   0 Y Oct 30 10:29:03 2001
A1000002.std   75497472 20   422 IBP NTSC 0   0 Y Oct 30 10:30:13 2001
A1000003.std    75890688 20    422 IBP NTSC 0    0 Y Oct 010:31:22 2001
A1000004.std    75497472 20  422 IBP NTSC 0     0 Y Oct 30 10:32:32 2001
```

📄 *You should limit your listing of files with a name including the wildcard symbol (*) to prevent a long listing of the Video File System. This is especially important on systems that may have several thousand clips stored.*

fs_util

The fs_util utility provides a number of tools to observe and manage playout of content on the system. Running fs_util without command flags will provide information about disk content as well as an update on playback (Read) and record (Write) streams occurring on system server nodes.

```
FSC Server: fsc1001 [FSC READY,Primary,HSB Connected]

TotalDiskSpace = 544.53 GB      FreeSpace = 540.31 GB   AvailSpace =
540.28 GB
DiskSet: 0       Total = 544.53 GB      Free = 540.31 GB        Avail =
540.28 GB

Stream   Handle   NODE  L-Block    Media Name      M Type ST Date
--------------------------------------------------------------------------
 8010203 40002590 2.3   32             A1000036.std    W RECD OK 10-30-01
11:09:58
48010203 40002591 2.3   32             A1000036.ft     W RECD OK 10-30-01
11:09:58
Total Streams: 2 Displayed: 2
M  (MODE)  R = Read, W = Write
ST (STATE) OK, NF:Not found, NA:Not active, CP:Close Pending
```

The fs_util command flags:

- -a – Show all streams
- -k – Kill stream
- -d – Kill non-active streams for specified node
- -r – Kill all streams for specified node
- -m – Forcefully make more current (latest) FSC READY(IN_SYNC)
- -p – Ping the disk proxy to check if it is online
- -R – Request proxy to re-discover disks on or offline
- -D – Get disk list from proxy (-o 1 will refresh proxy)
- -o – Option bits (specific to command type)
- -L – Show disk label information
- -h – Show help

fs_dump_meta

The fs_dump_meta utility provides important information about video file content on the Storage Subsystem. Enter fs_dump_meta –c <filename> to get the following report on individual video clips.

```
C:\fsc>fs_dump_meta -c A1000038
FSC Server: fsc1001 [FSC READY,Primary,HSB Connected]

Item: A1000038.std
  Version =  1 setNum = 0 tracks = 2 suspect = n delProt = No
  created on Oct 30 11:12:16 2001  modified on Oct 30 11:12:16 2001
  expiration date:   Feb 07 16:59:44 2037
  startTimeCode: 00:0
  0:00:00   mediaDuration: 00:00:30:02
  Track: std
  stripeDepth = 96 blks numAus = 39 maxStripes = 192
  lastStripeSize = 393216  track size = 75497472 firstAu = 0
  Video std = NTSC  Format = 422; IBP  Stream = MPEG-1 S Bitrate=20000000
  Audio Formats: (Off,Off) (Off,Off) (Off,Off) (Off,Off)
  User Info Track: No
Item: A1000038.ft
  Version =  1 setNum = 0 suspect = n delProt = No
  created on Oct 30 11:12:16 2001  modified on Oct 30 11:12:16 2001
  expiration date:   no expiration date
  Track: ft
  stripeDepth = 96 blks numAus = 1 maxStripes = 1
  lastStripeSize = 393216  track size = 393216 firstAu = 0
  User Info Track: No
```

fsc_revisions

The fsc_revisions command returns the current software revision running on the FSC.

```
C:\fsc>fsc_revisions
FSC_G.01.02.00
```

checkLan

The checkLan command pings all relevant LAN connections from the selected FSC. This tool is valuable when troubleshooting potential VLAN issues. The tool is available for the MSi and the Gateway.

📖 *If an external router is connected to the system, the router should be disconnected before running this command to prevent false reports of successful completion.*

Open an FSC telnet session and enter `checkLan` at the prompt:

```
C:\fsc>checkLan
        ----------------------------------------------------------
        ----------------------------------------------------------
              checkLan Version 1.00
        ----------------------------------------------------------
        ----------------------------------------------------------
Please enter the total of:

              Mss Nodes for this Cluster [0..16]:    2
              Msi Nodes for this Cluster [0..2]:     1
          Gateways for this Cluster [0..8]:      0
```

The utility will run a script to scan the VLAN addresses. Three prompts will ask you for the number of MSS server nodes, the number of MSi PCs, and the number of Gateways in the system. Enter the appropriate values. The utility will scan all critical IP paths. If it encounters errors, it will pause initially and then report the errors. If there are no errors, the utility takes no more than a second or two to run.

```
0.73.22.2    ok
        MSI01
        ----------------------
        10.73.1.5     ok
        10.73.2.5     ok
        10.73.3.5     ok
        10.73.4.5     ok
        10.73.5.5     ok
        10.73.6.5     ok
        10.73.7.5     ok
        10.73.8.5     ok
        10.73.9.5     ok
        10.73.10.5    ok
        10.73.11.5    ok
        10.73.12.5    ok
        10.73.13.5    ok
        10.73.14.5    ok
        10.73.15.5    ok
        10.73.16.5    ok
        MSS01
        ----------------------
        10.73.1.3     ok
        MSS02
        ----------------------
        10.73.2.3     ok
        CON01
        ----------------------
        10.73.1.4     ok
        CON02
        ----------------------
        10.73.2.4     ok
C:\fsc>
```

Troubleshooting Database Problems

If a FSC reports back from fsc_status as NOT_READY, this means that the database is out of sync with the media disks and the MSS 8000 server node cannot establish communication with it. The following describes two problem scenarios and recovery procedures from them.

Problem 1

After an ungraceful shutdown, due to a power failure or other event, both FSCs come up as Secondary, Broken and NOT_READY.

Recovery

1. Keeping both FSCs running in the Secondary Broken NOT READY state. Open a telnet session on one of them.

2. Enter `fs_util -m`.

   The utility will check both FSCs to determine which one is more current and then switch it to READY. Watchdog will then switch it to FSC Primary Alone, and then automatically perform an fsc_copy to update the second FSC. The second FSC is restarted and should have the status of Ready, OK.

Symptom 2

One FSC comes up as Secondary Broken NOT READY and the other FSC fails to start and errors out when running fsc_start.

Recovery

1. Try to run **fsc_start** a second time on the unit that failed to start successfully.

2. If this fails, run **fsc_stop** on the unit that came up as Secondary Broken NOT READY.

3. Try to run **fsc_start** a third time on the unit that initially failed to start successfully.

   If it starts successfully restart the FSC that initially came up as Secondary Broken NOT READY. Both units should come up and running in a READY state.

   If it doesn't start successfully, call Avid MediaStream Support.

This section discusses server node log files and basic troubleshooting commands.

Log Files

The following section describes the server node's two log files: syslog and eLog.

syslog File

The syslog file records major events during serer startup or shutdown. The syslog file is stored in the /bvs directory. To view recent entries in the syslog, open a telnet session. Then enter
`tail –20 /bvs/syslog` to open the last 20 lines of the syslog file.

eLog File

The eLog resides in /bvs/tmp directory. The file name is bvs.log.xx (where *xx* are the last two characters of the server node's hostname).

mss0101 = bvs.log.01

mss0102 = bvs.log.02

The eLog can also be read using the commands tail, vi, or more. Locate the file in /bvs/tmp and enter `ls` to verify the files name and location. To display the last 20 lines in the file enter:

tail –20 bvs.log.xx

The eLog file can be dynamically accessed by entering **tlog** In this mode, the log updates automatically as new error states are introduced. Start a telnet session as root. Then enter **tlog**. Press Ctrl+C to exit tlog.

Be careful when using the tlog command with an on-air server node; it could take the node off-air.

Clearing the eLog File

If the eLog file is too large, or if you want to start monitoring the system with a clean log, enter `clearlog`. This command will move the contents of the bvs.log.xx to bvs.log.xx.old.The new bvs.log.xx will start out empty, and will begin to fill as the system records new errors.

UNIX Commands

UNIX commands that aid Avid MediaStream Support in maintaining servers are described below.

revisions

The revisions command displays the status of the server node software and firmware.

revisions -a will safely list the complete software revision

revisions -c describes the installed CPU

Do not run the revisions command without modifiers on an on-air system as it could lock the server up requiring a reboot bringing the server off the air.

This information is useful to provide for Avid MediaStream Support when diagnosing potential problems. Entering the revisions command returns the following:

```
-------------------------------------.
      |        SNAPSHOT REVISION OF BVS SOFTWARE        |
      |        This is for Avid MediaStream SupportSystems internal    |
      |        use only.  No support is guaranteed!    |
      |                                                 |
      |        Snapshot revision ====>> C.15.10.snap0927  |
      |        Directory: /users/steam/SAN.snap0917    |
      |        Date:  28Sep01  //  12:30pm             |
       `------------------------------------------------'
 Media Stream Server (MSS) Software:
     BVS System Controller code..................... C.15.00
     Decoder Firmware, and FPGA ( 4:2:0 / 4:2:2 ).. 2.45, ( 1.23 / 1.7 )
     HD Decoder Firmware ......................... 3.4
     Encoder Firmware, and FPGA ( 4:2:0 / 4:2:2 ).. 2.38, ( 2.23 / 1.7 )
     HD Input Board Firmware ...................... 3.3
     Maximum bitrate (bits/s) (from bvsrc)........ 30000000 (default)
     Composite2D1 PLD, FW ( NTSC / NTSCJ/ PAL ) ... 1.4, ( 1.4 / 1.3 /
1.4 )
 LynxOS:
     CPU type and frequency ...................... 743 (100 MHz)
     LynxOS Operating System Rev and Patch Leve... A.03.01  PL000022
     Fibre Channel Lan Driver .................... N/A
     Fibre Channel Disk Driver ................... ?
     SAN Disk Driver ............................. 1.7 1.7
     System Controller Disk ModelNum and Firmware.. [QUANTUM:SCA] - 0909
 Video File System:  N/A
```

mdsutil

The mdsutil command allows you to review the storage capacity as well as read/write
activity on the arrays. This command is useful in diagnosing whether disk activity is actually
taking place and if data is being written or read at any given moment. To invoke this
command, enter mdsutil. Output similar to the following is displayed.

```
 [root@1002 /] mdsutil
AvailStrm =        36   MaxBit/Strm =  45000000   I/O BlkBytes =     393216
AvailBits = 300000000   MaxServerBW = 320000000   AllocedBW   =   20000000
Streams   =         2   Buses:Disk/Bus =   1:1   DiskType    =          2

AvgDiskTime =     66 msec   Max =   1140 msec   Min =      49 msec
Avg Wait Qlen =      0       Avg Active Qlen =      0

Total averaged disk(s) server bitrate  =    7.0 MegBit/sec

Characteristics of each active stream:
Stream  Tag        Pid   Mb/s    Last Block  Media Name        Svc Type
Mode
------  ---        ---   ----    ----------  ----------        --------  -
---

   15   DEC1B      104   20    65             A1000001      VIDEO     READ
   16   ENC1       130   20     0             A1000002      VIDEO    WRITE
```

vmescan

The vmescan command shows which boards are "addressed" by the server node. Run this command if an error occurs while running startams because of an undetected board. If an installed board is not addressed or present in the listing, shut the server down and turn it off, and reseat the suspected board. If the board still fails, install it in another VME slot to isolate whether the board or the chassis is problematic.

When diagnosing specific boards, enter flags to return output for the specific board:

- vmescan -d scans decoders only
- vmescan -e scans encoders only
- vmescan -u scans utility boards such as the A/D converter board

```
[root@01 /bvs] vmescan -d

Indx Type    <-- Address Range --> <Queried>  <Conclusion>

32   Decoder 0x80000000 0x83FFFFFF 0x00000000 4:2:2 EA Decoder FOUND at -d 0
33   Decoder 0x84000000 0x87FFFFFF 0x00000000 4:2:2 EA Decoder FOUND at -d 1
34   Decoder 0x88000000 0x8BFFFFFF 0xffffffff No board found.

35   Decoder 0x8C000000 0x8FFFFFFF 0xffffffff No board found.
```

hostname

Use the hostname command to verify that your server hostname is correct.

```
[root@01 /bvs] hostname
mss0101
```

sand_state –s

The sand_state command with a –s flag will provide the current status of the Fibre Channel Driver. The display provides about two screens of data. What you are looking for is the [FCSA_READY] state after Fibre Channel Driver State. This status will appear twice in the display. Both must be set to [FCSA_READY]. If the display is FCSA_AWAITING_LINKUP] or another value, the Fibre Channel Driver did not initialize. This is a good command to run when first bringing up the System to make sure the server

node can communicate with the storage system. Start the server node by entering startams with the –f flag. This will save having to go through the entire boot sequence before you verify the state of the Fibre Channel Drivers.

```
[root@1001 /bvs] sand_state -s
items 0x1e fcsa_rmgr.numBlocks 0xa fcsa_rmgr.blockSize 0x180000
----------------------------------------------------------------------
 Driver Build Information:
----------------------------------------------------------------------
Driver Revision: 1.7
Build Date:      Fri Oct 19 14:35:25 PDT 2001
Built By:        dlow@vidux066
Build Directory: /users/steam/SANrelease
----------------------------------------------------------------------
 Driver State Information:
----------------------------------------------------------------------
Fibre Channel Driver State:     0x0000000F [FCSA_READY]
Tachyon Configuration Register: 0x40000A00
Tachyon Status Register:        0x00001016
Tachyon ee_cr_0_tmr:            0x00000000
Tachyon bb_cr_0_tmr:            0x000001E7
Frame Manager Config Register:  0x72000200
Frame Manager Status Register:  0x98000000
Frame Manager TOV Register:     0x00000000
Frame Manager Link Err Stat 1:  0x00000000
Frame Manager Link Err Stat 2:  0x00000000
Frame Manager WWNHI:            0x00010800
Frame Manager WWNLO:            0x09D40E40
items 0x1e fcsa_rmgr.numBlocks 0xa fcsa_rmgr.blockSize 0x180000
Driver Build Information:
----------------------------------------------------------------
```

```
Driver Revision: 1.7
Build Date:      Fri Oct 19 14:35:25 PDT 2001
Built By:        dlow@vidux066
Build Directory: /users/steam/SANrelease
---------------------------------------------------------------------
Driver State Information:
---------------------------------------------------------------------
Fibre Channel Driver State:     0x0000000F [FCSA_READY]
Tachyon Configuration Register: 0x40000A00
Tachyon Status Register:        0x00001016
Tachyon ee_cr_0_tmr:            0x00000000
Tachyon bb_cr_0_tmr:            0x0000003E
Frame Manager Config Register:  0x71000200
Frame Manager Status Register:  0x98000000
Frame Manager TOV Register:     0x00000000
Frame Manager Link Err Stat 1:  0x00000000
Frame Manager Link Err Stat 2:  0x00000000
Frame Manager WWNHI:            0x00010800
Frame Manager WWNLO:             0x09D4E41
```

san_checkLan

This utility pings the connections of all devices connected to the VLAN switches. This utility should be run if you suspect network communication problems between devices.

Running san_checkLan –h provides the following options.

- -m <msi units> – Number of MSI units (0, 1, or 2) default 1

- -v <ports> – Ports on VLAN switches (12 or 24) default 12

- -s – Only show IP addresses, no pings. THIS OPTION MUST BE LAST.

- -h – Show this help menu

Any failure to ping a device is reported in the display and recorded in log directory:

/bvs/tmp/san_checkLan.log

```
 [root@1001 /bvs/tmp] san_checkLan

Test LAN Network Connections to the FSC controllers
This node 'mss1001' (IP addr 10.73.1.3) is in Cluster '10' and VLAN '1'
Options set for 1 MSi units and VLAN switches with 12 ports.

FSC A using switch A uses IP = 10.73.1.1 (using VLAN switch B IP = 10.73.21.1)
FSCB using switch B uses IP = 10.73.1.2 (using VLAN switch A IP = 10.73.21.2)
MSI A using switch A uses IP = 10.73.1.5 (using VLAN switch B IP = 10.73.8.5)

Attempt to ping all 4 IP addresses for FSC units.
Ping FSC A using VLAN Switch A and IP address '10.73.1.1'

Ping FSC A using cross-switch IP address '10.73.21.1'

Ping FSC B using VLAN Switch B and IP address '10.73.1.2'

Ping FSC B using cross-switch IP address '10.73.21.2'

Ping MSI A using VLAN Switch A and IP address '10.73.1.5'

Ping MSI A using cross-switch IP address '10.73.8.5'
3 packets transmitted, 0 packets received, 100% packet loss
WARNING: Cannot find MSI A using cross-switch IP '10.73.1.5'.

Any errors that occured would show in above text and also the log.
A detailed log can be found in '/bvs/tmp/san_checkLan.log'
```

Tools for ConnectPlus NS Gateway PC Administration

The following log files can be helpful in troubleshooting the Gateway PC:

FSC.log

The `fsc.log.<xx>` file provides the primary login function for the Gateway PC. The log file, found in `C:\fsc\logs` is named `fsc.log.<xx>` (xx being the last two characters in the gateway name. The file contains one backup copy of this file named `fsc.log.<xx>.old`. Should you wish to preserve log files beyond this, you can copy the log file to a new directory and/or rename it. Use the clearlog command to clear the log

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file and start new. When the log file is cleared, the existing log file replaces
`fsc.log.<xx>`.old and an empty log file is available for recording messages.
Periodically check the log to make sure it isn't too large.

Server.log

The `server.log` file captures ftp data and ftp transmission errors. Find it in
`c:\pinnacle`

More information on Gateway PC installation, configuration and troubleshooting is available in the ConnectPlus 1000 Networked Storage Installation and Operations Guide.

Appendix A
MSS 8000 Bandwidth Tables

This appendix provides tables that allow you to determine bit-rate channel bandwidth for the MediaStream Networked Storage System, working with Standard Definition video. Input and output channels and system channel bandwidth are covered.

To determine bandwidth figures for High Definition video, consult Avid MediaStream Support.

The following table represents the maximum allowable bit rates based on various combinations of encoder and decoder channel usage. The maximum bit rate for an individual HD- and SD- stream on the server is 60Mb/sec. The MSS 8000NS server allows for encoder and decoder usage for up to 16 channels per Server.

The maximum allowable bit rate per server node is 300-Mbps for the Networked Storage System.

MSS 8000si Channel Bandwidth (in Mbps)

Inputs	Outputs																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0		60	60	60	50	40	33	28	25	22	20	18	16	10	10	10	10
1	60	60	60	54	42	35	30	26	23	20	18	17	10	10	10	10	
2	60	60	60	46	37	31	27	24	21	19	17	10	10	10	10		
3	60	60	50	40	33	28	25	22	20	18	10	10	10	10			
4	60	54	42	35	30	26	23	20	18	10	10	10	10				
5	60	46	37	31	27	24	21	19	10	10	10	10					
6	50	40	33	28	25	22	20	10	10	10	10						
7	42	35	30	26	23	20	10	10	10	10							

MSS 8000si Channel Bandwidth (in Mbps) (Continued)

Inputs				Outputs													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
8	37	31	27	24	21	10	10	10	10								

This chart represents a server node receiving the maximum allowable bit rate of 300 Mbps. Depending on the number of nodes and total channels supported by the storage system, the total bit rate allocated for your server node may be less.

Use the matrix to match your desired channel bit rate to the combination of encoder and decoder channels. For example, with 8 decoder channels and 2 encoder channels you can have a maximum channel bit rate of 17 Mbps.

System Channel Bandwidth

The following table provides a matrix of maximum supported bit rates for variously configured MSS Networked Storage Systems. The columns are in groups of three representing MSS 8000 server nodes configured with either 5, 8, or 10 channels each. Each row represents a system configured with from one-to-eight array storage units.

As matrix values max out, additional arrays can add storage capacity but not improve output bandwidth. This is because each server node has a maximum bandwidth of 300 Mbs.

MSS 8000 System Channel Output Bandwidth (in Mbps)

Channels per Node	5	8	10	5	8	10	5	8	10	5	8	10	5	8	10	5	8	10
Number of Nodes		2			3			4			5			6			7	
Total System Channels	10	16	20	15	24	30	20	36	40	25	40	50	30	48	60	35	56	70
Arrays																		
1	30	20	16	21	13	10	16	10	8	12	8	6	10	6		9		
2	30	20	16	30	20	16	26	16	13	21	13	10	17	11	8	15	9	7

MSS 8000 System Channel Output Bandwidth (in Mbps)

5 8 10 Channels per Node

Number of Nodes	2			3			4			5			6			7		
Total System Channels	10	16	20	15	24	30	20	36	40	25	40	50	30	48	60	35	56	70
3	30	20	16	30	20	16	30	20	16	28	18	14	24	15	16	20	12	10
4	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16	27	17	13
5	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16	30	19	15
6	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16
7	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16
8	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16	30	20	16

Number of Nodes	8			9			10			11			12			16		
Total System Channels	40	64	80	45	72	90	50	80	100	55	88		60	96		96		
Arrays																		
1	8																	
2	13	8	6	11	7		10	6		9	6		8					
3	18	11	9	16	10	8	14	9	7	13	8		12	7		9		
4	18	18	12	21	13	10	19	12	9	17	10		16	10		12		
5	21	16	13	23	14	11	21	16	10	19	12		17	11		13		
6	30	20	16	28	17	14	25	16	12	23	14		21	13		16		
7	30	20	16	30	20	16	29	18	14	27	16		24	15		18		
8	30	20	16	30	20	16	30	20	16	30	19		28	17		21		

Total Bandwidth = 480 Mbps for 1 array, 400 Mbps for 2 arrays, 360 Mbps for 3-4 arrays and 320 Mbps for 5-8 arrays

Channel Output Load = 1.5 x Encoder Bit Rate (i.e., Input Load)

To use the matrix in the previous tables, determine the optimum bit rate you wish to operate at and the number of channels you wish to output. Find the closest value on the matrix to determine the number of MSS 8000 server nodes, arrays, and total channels required to support that bit rate. For example, you want your system to output 50 channels at 20 Mbps. The table shows that a system with seven server nodes with eight channels per node and six arrays will support 20 Mbps for up to 55 channels.

These tables represents maximum channel bandwidth for nodes configured with SD Decoders only. Systems with a mix of encoders and decoders may have slightly different limits.

HD input channels and HD decoders allow for bandwidths of up to 50 Mbs per channel. As with SD decoders, allow a 1.5x factor for cue channels. Input channels can be calculated directly.

Each Gateway in the system must be treated as a separate server node. depending on the bandwidth throttle setting, each Gateway can use up to 300 Mbps of bandwidth. You must plan for Gateway bandwidth when designing your overall system. See Connect Plus 1000 Networked Storage Installation and Operations Guide for more information on Gateway bandwidth throttle settings.

Disk System Bandwidth

The following table lists the maximum disk system bandwidth (in Mbps) for an MSS 8000, based on the number of arrays on the system and the FSC type in use. Note the italicized maximum effective bandwidth for each FSC type.

FSC	SuperMicro FSC40	IBM FSC100	WinterPark FSC40	Westville2 FSC100
# Arrays				
1	480	480	480	480
2	800	800	800	800
3	1080	1080	1080	1080
4	1200	1440	1280	1440
5	"	1600	"	1600

FSC	SuperMicro FSC40	IBM FSC100	WinterPark FSC40	Westville2 FSC100
6	"	1920	"	1920
7	"	"	"	2240
8	"	"	"	2300

Appendix B

Cables and Connectors

This appendix provides information about these cables and connectors for the MSS 8000:

- RS-422 cable and connectors
- AES/EBU input and output
- Fibre Channel Cables: Fibre-Over-Copper cables

RS-422 Connectors and Cables

Use only industry approved connectors and cables when planning for your installation. Some RS-422 cables provided by other manufacturers may not meet the radiated emissions standards specified for the Server Node. It this is a problem for your station, the following figure illustrates how to make your own.

RS-422 Cable
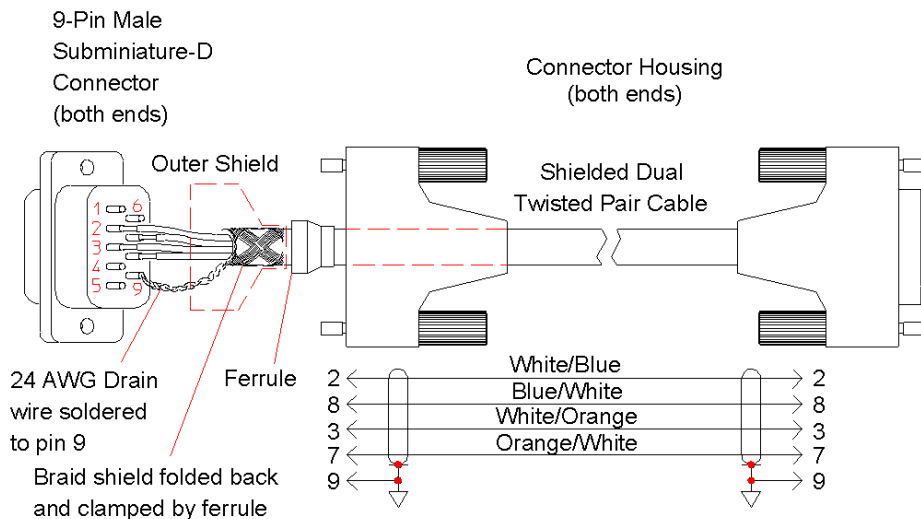
RS-422 cables and connectors should be commonly available from most electronic supply outlets.

RJ45 to DB9 Cable Diagram

RJ-45 Connector

RS 422 Control Cable

DECODER (RJ45)			AUTOMATION (DB9)	
	PIN			PIN
Do Not Use	1	Blue		
Rx +	2 ◄———	Orange ———————		3
Rx -	3 ◄———	Black ———————		8
Tx -	4 ———	Red ———————►		2
Tx +	5 ———	Green ———————►		7
Gnd	6 ◄———	Yellow ———————►		6
Gnd	7 ◄———	Brown ———————►		1
Do Not Use	8	Black		

RJ45 to DB9

RJ-45 Male   DB-9 Female
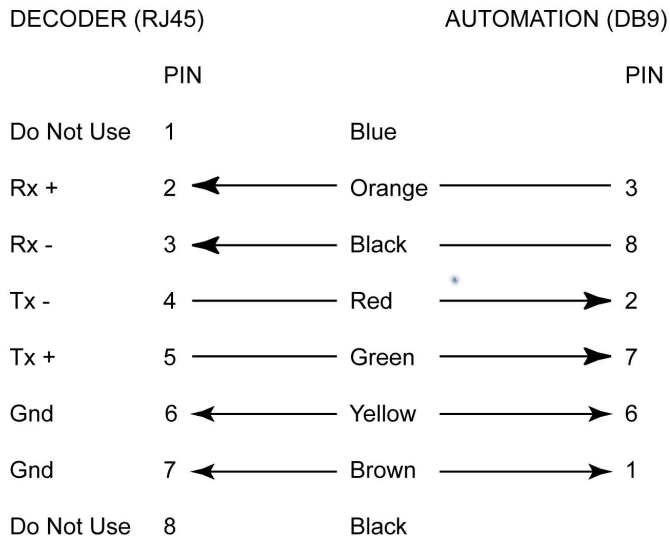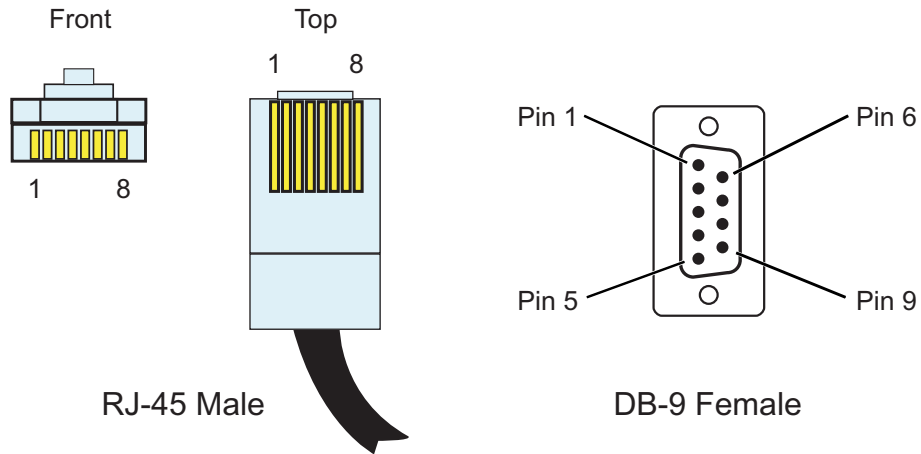
Serial Y-Cable to Automation Remote Control and Converter

Y-Cable From RJ45 Decoder Connector

Decoder RJ45 Pin Number	Automation DB9 Pin Number	External Converter DB9 Pin Number	Signal
1	Not used	3 (RX)	
2	3	Not used	Receive +
3	8	Not used	Receive –
4	2	Not used	Transmit –
5	7	Not used	Transmit +
6	6	Not used	Ground
7	1	1	Ground
8	Not used	2 (TX)	

AAES/EBU Audio Connectors and Cables

This cable is designed to connect to the MSS 8000si AES/EBU audio connector.

AES/EBU Cable
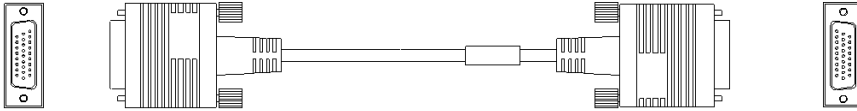
If you have any of the audio interface panels, you will not need to make your own connector. The appropriate cables are provided with your order.

Where to Obtain the Connector

Contact Amp, Incorporated and ask for the AMPLIMITE® HDP-22 (26 pin) plug, drawing # 748474-1 or equivalent.

AMP, Inc.
Harrisburg, PA
Toll free: 800-522-6752
Phone: 717-564-0100
Fax: 717-986-7575
Web site: www.amp.com

Where to Obtain the Cable

Use an overall shielded 28 AWG copper drains cable that contains 9 twisted pairs. The outer shield should make a 360-degree connection to the connector shell. Use Belden™ 9809 cable or equivalent.

Belden Wire & Cable Company
2200 US Highway 25 S
Richmond, IN 47375
Toll free: 800-235-3361
Phone: 765-983-5200
Fax: 765-983-5294
Web site: www.belden.com

Micro D-sub 15 Decoder (Output Audio 6 Channel) Connection

Pin No.	Description	Pin No.	Description
1	Analog Output Ch 1 – (Left)	9	NC
2	Analog Output Ch 1 + (Left)	10	Output Analog Ch 4 – (Right)
3	Ch 5/6 –	11	Output Analog Ch 4 + (Right)
4	Ch 5/6 +	12	Output Analog Ch 3 – (Left)
5	Ch 3/4 –	13	Output Analog Ch 3 + (Left)
6	Ch 3/4 +	14	Output Analog Ch 2 – (Right)
7	Ch 1/2 –	15	Output Analog Ch 2 + (Right)
8	Ch 1/2 +		

Dual Decoder AES/EBU 6-Channel Audio Output
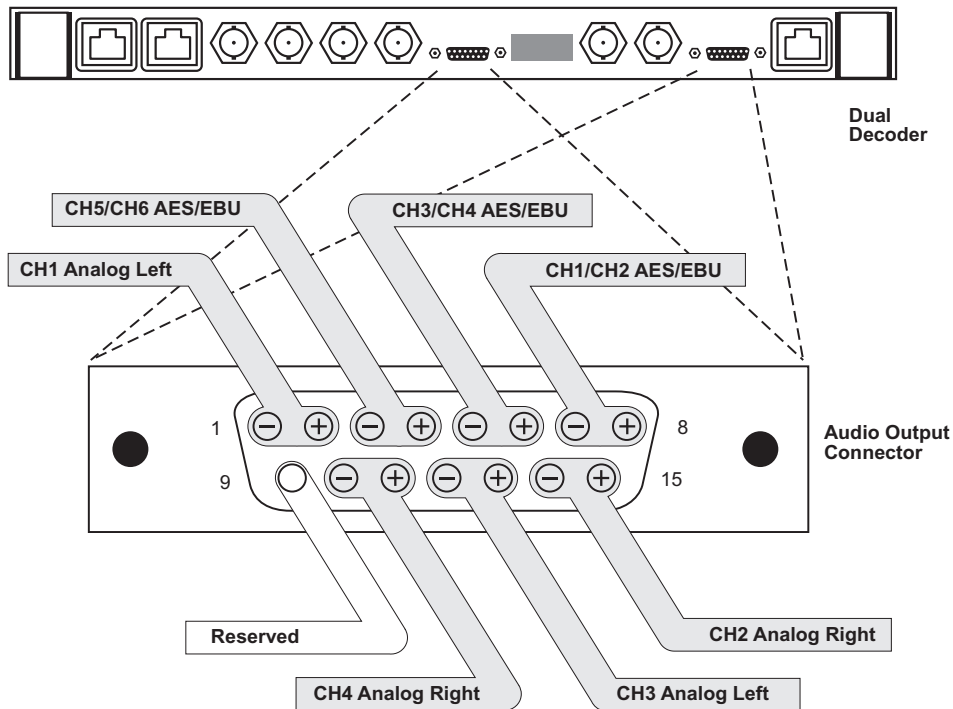
Micro D-sub 15 Decoder (Output Audio 8 Channel) Connection

Pin No.	Description	Pin No.	Description
1	Analog Output Ch 1 – (Left)	9	NC
2	Analog Output Ch 1 + (Left)	10	Ch 7/8 –
3	Ch 5/6 –	11	Ch 7/8 +
4	Ch 5/6 +	12	Do Not Use
5	Ch 3/4 –	13	Do Not Use
6	Ch 3/4 +	14	Output Analog Ch 2 – (Right)
7	Ch 1/2 –	15	Output Analog Ch 2 + (Right)
8	Ch 1/2 +		

Dual Decoder AES/EBU 8-Channel Audio Output
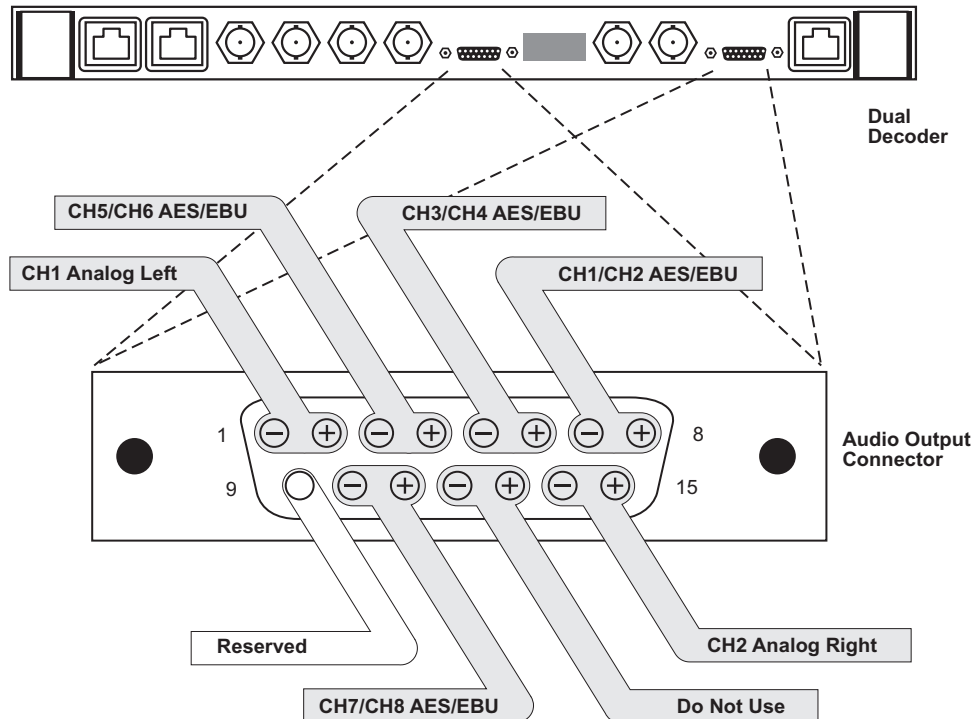
Single SD Encoder (Input Audio 8 Channel) Connections

Pin No.	Description	Pin No.	Description
1	Do Not Use	9	Do Not Use
2	Do Not Use	10	Ch 7/8 –
3	Ch 5/6 –	11	Ch 7/8 +
4	Ch 5/6 +	12	Do Not Use
5	Ch 3/4 –	13	Do Not Use
6	Ch 3/4 +	14	Do Not Use
7	Ch 1/2 –	15	Do Not Use
8	Ch 1/2 +		

Single Encoder 8-Channel Audio Input
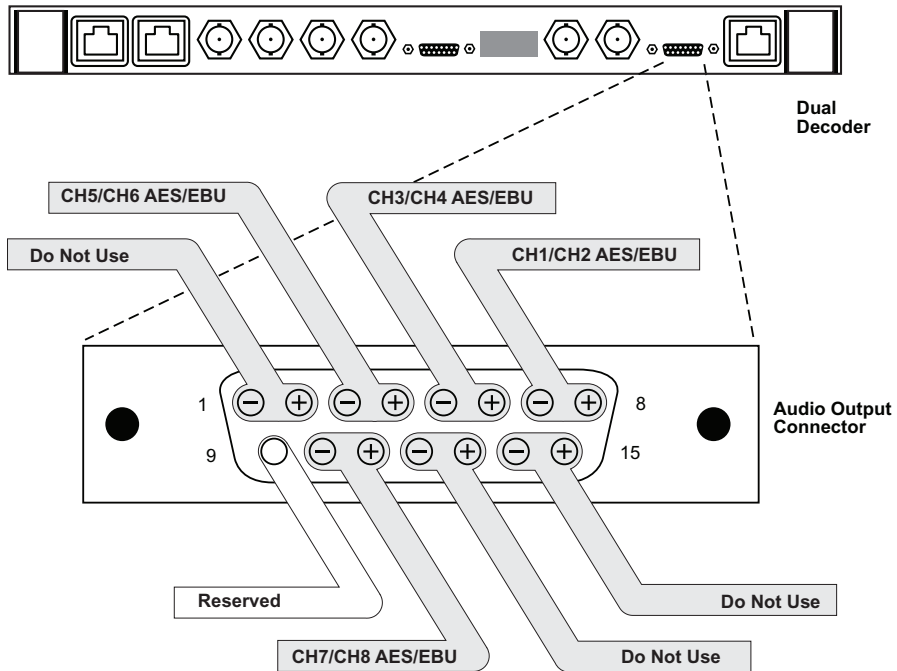
Where to Obtain the Connectors

Contact Amp, Incorporated and ask for the AMPLIMITE® HDP-22 (26-pin) plug, drawing # 748474-1 or equivalent.

AMP, Inc.
Harrisburg, PA
Toll free: 800-522-6752
Phone: 717-564-0100
Fax: 717-986-7575
Web site: www.amp.com

Where to Obtain the Cable

Use an overall shielded 28 AWG copper drains cable that contains 9 twisted pairs. The outer shield should make a 360-degree connection to the connector shell. Use Belden™ 9809 cable or equivalent.

Belden Wire & Cable Company
2200 US Highway 25 S
Richmond, IN 47375
Toll free: 800-235-3361
Phone: 765-983-5200
Fax: 765-983-5294
Web site: www.belden.com

Fibre Channel over Copper Cables

MSS Networked Storage uses Fibre Channel over Copper cables to connect the Fibre Channel switches with the storage array. These cables use a standard HSSDC connector at the Switch end and a DB-9 connector at the array end. Use care when handling the cables.

Where to Obtain the Cable

CS Electronics
17500 Gillette Ave
Irvine, CA 92614
Phone: 949-475-9100
Fax: 949-475-9119
Web site: www.cselex.com

Appendix C
Network Block Diagrams

The following four block diagrams are intended to provide you with various visual schemes of how networks might interface with the Avid MediaStream SupportSystems MSS Networked Storage System solutions.

📖 *The Network System Block Diagrams are visual representations only, and may or may not reflect the way your MSS Networked Storage System is set up.*

1. Two Networked Storage Clusters (Non-Redundant Automation and Gateway)

MSS0101 - - - - MSS0116

FC to Storage

Note: Highlighted items are supplied by Pinnacle Systems. All others are customer supplied.

VLAN-A
HPJ4812A Switch
21   17

VLAN-B
HPJ4812A Switch

GWY0101

10.80.128.1 \24   Automation

10.80.128.7 \24

Gig-Ethernet
(copper)

HP 5300
10/100/
Gig-Ethernet
Layer 3 Switch
10.80.128.250\16

T a p e
L i b r a r y

Fibre
Channel

FTP Data and Control

Gig-Ethernet
(copper)

10.80.128.3 \24   Archive
Control

10.80.128.11

Gig-Ethernet
(copper)

GWY0201

21   17
VLAN-A
HPJ4812A Switch

VLAN-B
HPJ4812A Switch

MSS0201 ▪ ▪ ▪ ▪ MSS0216

2. Two Networked Storage Clusters (Fully-Redundant Automation and Gateway)

MSS0101 - - - - MSS0116

FC to Storage

VLAN-A
HPJ4812A Switch
21   17

VLAN-B
HPJ4812A Switch
17   21

**Note: Highlighted items are
supplied by Pinnacle System
All others are customer sup**

GWY0101   GWY0102

10.80.129.1 \24

Automation

10.80.128.1 \24

10.80.129.2 \24

**Automation
Backup**

10.80.128.2 \24

10.80.128.7 \24
FTP Data and Control

10.80.129.7 \24
FTP Data and Control

**Gig-Ethernet
(copper)**

**HP 5300
10/100/
Gig-Ethernet
Layer 3 Switch
10.80.129.250\16**

**HP 5300
10/100/
Gig-Ethernet
Layer 3 Switch
10.80.128.250\16**

**Gig-Ethernet
(copper)**

FTP Data and Control

FTP Data and Control

**Tape
Library**

Fibre
Channel

10.80.129.3 \24

**Gig-Ethernet
(copper)**

**Archive
Control**

10.80.128.3 \24

10.80.128.11
**Gig-Ethernet
(copper)**

10.80.129.11
**Gig-Ethernet
(copper)**

GWY0201   GWY0202

21   17
**VLAN-A
HPJ4812A Switch**

17   21
**VLAN-B
HPJ4812A Switch**

MSS0201 - - - - MSS0216

3. Networked Storage System to Legacy MediaStream (Non-Redundant Automation and Gateway)

MSS0101	- - - -	MSS0116	

FC to Storage

VLAN-A
HPJ4812A Switch
21   17

VLAN-B
HPJ4812A Switch

10.80.128.1 \24   Automation

GWY0101

FTP Data and Control
10.80.128.7 \24

Gig-Ethernet
(copper)

HP 5300
10/100/
Gig-Ethernet
Layer 3 Switch
10.80.128.250\16

Gig-Ethernet
(copper)

Tape
Library

Fibre
Channel

10.80.128.3 \24   Archive
Control

10.80.128.4 \16
Gig-Ethernet
(fiber)

Ethernet
Hub for
MSS 1600

10.80.128.6 \16

GWY
MSS 1600

10.80.128.5 \16

Fibre
Channel
(optical)

MSS 1600

MSi for
MSS 1600

Note: Highlighted items are supplied by Pinnacle Systems. All others are customer supplied.

MediaStream 1600 Legacy System

4. Networked Storage System to Legacy MediaStream (Fully-Redundant Automation and Gateway)

Note: Highlighted items are supplied by Pinnacle Systems. All others are customer supplied.

Important: If more than one 1600/700 server is used, all servers must plug into the same Ethernet hub.

Appendix C   **Network Block Diagrams**

Appendix D

Legacy FSC and MSi Front & Back Panels

File System Controllers: Front Panels
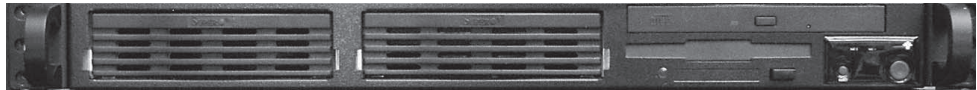
Super Micro PC

IBM 355

File System Controllers

File System Controllers: Rear Panels

Super Micro
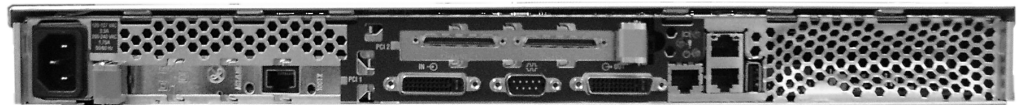
IBM 355

FSC 40
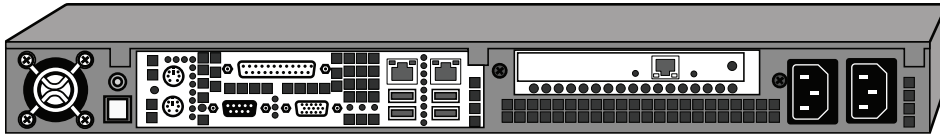
VLAN to MSi PC Connections
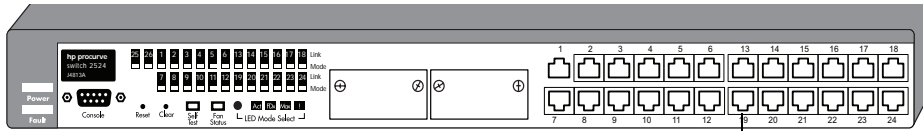
VLAN A

Port 19
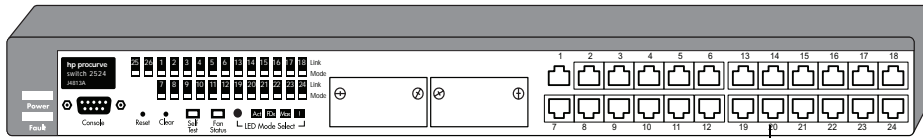
Port 20

VLAN B
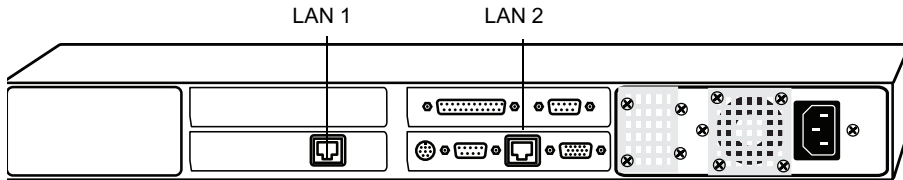
LAN 1   LAN 2

SuperMicro Keyboard, Video and Mouse Connections
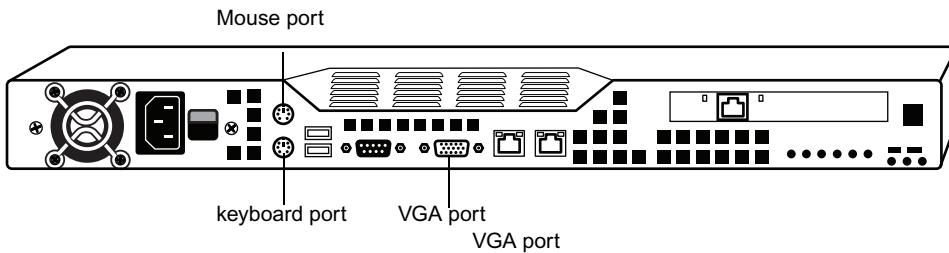
Mouse port

keyboard port   VGA port

VGA port

IBM 355 Keyboard Video and Mouse Connections

C2T Out Connector

MSi PC Keyboard, Video, and Mouse Connectors

Mouse/keyboard
port

VGA port
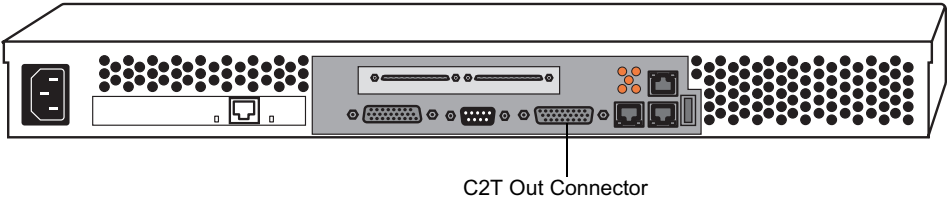
MSi PC Connections
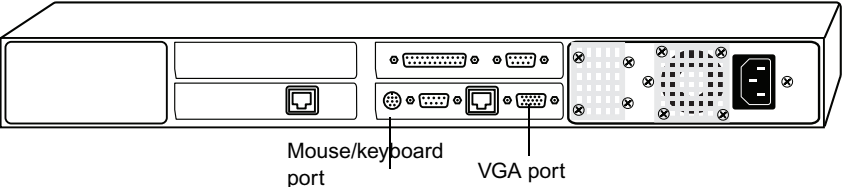
RS-232 connector (COM 2)
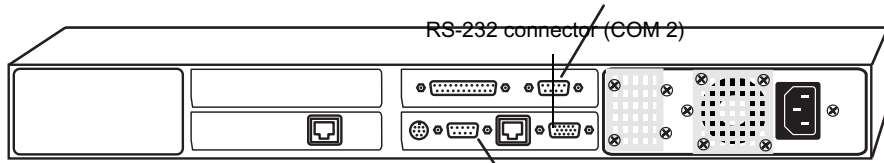
MSi PC

MSi PC

Modem (COM 2) Modem (COM 1)

RS-232 Connector

RS-232 connector
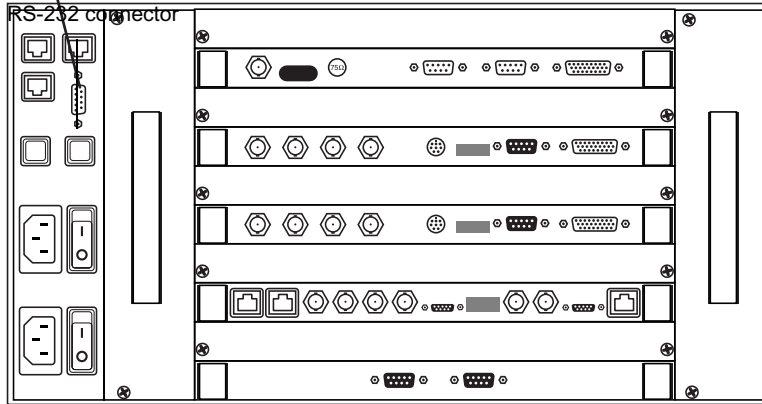
MSS-8000

MSS 8000

Appendix E
Specifications

MS Server 8000NS

Video

ITU-R BT.601-2 resolution MPEG 2

6 to 50 Mb/s, user selected (10 Mb/s quality comparable to 30 Mb/s MJPEG)

Serial digital component input/output

75 ohm BNC

NTSC/PAL analog output

Audio

4 or 8 channels (2 or 4 stereo pairs) per video channel.

AES/EBU 48 kHz, 16 bit

Musicam compliant

XLR and 75 ohm BNC connections available with optional interface.

Control

RS-422 control for each channel

Back-to-back frame-accurate play

Genlock video reference required for frame-accurate system operation.

Supplied system console provides a Windows 2000™ based interface separate from the automation for server set-up, diagnostics, and emergency play-to-air and dub.

Modem provides access for remote system diagnostics

Vertical Blanking Interval

Preserves any 6 of the following user-selected lines, luminance only:

525: lines 10-22 and 273-285

625: lines 7-22 and 320-335

Composite Video Output: the first half of NTSC Line 20, Field 2 is blanked as per NTSC standard.

Preserved Video Signal Lines

The following two lines are preserves in the video signal:

Teletext — line 9

Wide Screen Signaling — line 23 on SD PAL (specifically DVB-VBI ETSI-EN301775)

Environmental

Temperature

Non-operating/Storage Temperature Range: (w/o disks): –40° to 160°F (–40° to 70°C)

Operating Temperature Range: 50° to 95°F (10° to 35°C)

Recommended Operating Temperature Range: 68° to 78°F (20° to 25°C)

Temperature Shock Immunity: Maximum rate of Change: 0.59°F per minute or 36°F per hour (0.33°C/min or 20°C/hr)

Humidity

Non-operating/Storage Humidity Range: 15 to 90% RH

Operating Humidity Range @ 72°F (22°C): 20 to 80% RH

Recommended Operating Humidity Range @ 72°F (22°C): 30 to 50% RH

Altitude

Non-operating: 15,000 ft (4600 m) Operating: 10,000 ft (3100 m)

Temperature rating above 8,000 ft (2500 m): 95F (35C) over full range

EMC

Meets the requirements of:

- FCC Part 15 (Class A for Digital Equipment)
- EMC Directive 89/336/EEC (EN55103-1, EN50082-1, IEC801-2,3,4)
- CISPR 22/EN55022 Class A (1998/A1/A2)

Safety

UL approved for the U.S. (U.L. 1950) and Canada (C22.2 No. 950).

TUV approved for the U.S. (U.L. 60950-1:2003) and Canada (C22.2 No. 60950-1: 2003)
TUV approved for European Union: EN60950-1 + A11:2004

Fax Modem: Meets EN41003 and CSA C22.2 No. 225 (Telecom)

Component Specifications

The following tables provide the physical specifications for each MediaStream component.

Chassis Shipping Box Dimension

Component	Length	Width	Height
File System Controller:	23.5 in (59.7 cm)	34.0 in (86.4 cm)	8.0 in (20.3 cm)
MSi Monitor	19.5 in (49.5 cm)	20.5 in (52.1 cm)	7.25 in (18.4 cm)
MSi Computer	16.75 in (42.5 cm)	19.25 in (48.9 cm)	18.5 in (47 cm)

Chassis Shipping Box Dimension (Continued)

Component	Length	Width	Height
MSS 8000 Serve	35.0 in (88.9 cm)	36.0 in (91.4 cm)	19.0 in (68.6 cm)
Fibre Channel Switch	20.0 in (50.8 cm)	21.75 in (55.2 cm)	9.5 in (24.1 cm)
Palladium Store 1000 Chassis	27.5 in (69.9 cm)	24.75 in (62.9 cm)	14.5 in (36.8 cm)
Palladium Store 1000 Drives (2 boxes)	20.5 in (52.1 cm)	14.5 in (36.8 cm)	11.5 in (29.2 cm)
ConnectPlus 1000 NS Gateway	39 in (99 cm)	24 in (61 cm)	8 in (20.3 cm)

Rack Space Requirements for MS Products

Component	Rack Units	Height	Depth
File System Controller	1	1.75 in (4.4 cm)	28.25 in (71.8 cm)
MSi/Gateway Computer	1	1.75 in (4.4 cm)	17.2in (43.7 cm)
Monitor	10	18 in (45.8 cm)	17.0 in (43.2 cm)
Keyboard	1	1.75 in (4.4 cm)	6.75 in (17.2 cm)
MSS 8000 Server	5	8.75in (22.2 cm)	25.6 in (65.0 cm)
Fibre Channel Switch			
8-Port	1	1.66 in (4.2 cm)	16.3in (41.4 cm)
32-Port	2	3.4 in (8.6 cm)	18.5in (47.0 cm)
Palladium Store 1000	3	5.25 in (13.3 cm)	22 in (55.9 cm)
ConnectPlus 1000	1	1.75 in (4.4 cm)	26 in (66 cm)

Components Weights for MS Products

Component	Weight
File System Controller	27.8 lb (12.6 kg)
MSi PC	20 lb (9 kg)
Monitor	34.0 lb (15.5 kg)
Keyboard	2.5 lb (1.1 kg)
MSS 8000 Server	55.0 lb (25.0 kg)

Components Weights for MS Products (Continued)

Component	Weight
Fibre Channel Switch	
8-Port	10.7 lb (4.9 kg)
32-Port	18.5 lb (8.4 kg)
Palladium Store 1000	70 lb (32 kg)
ConnectPlus 1000 NS Gateway	30 lb (13.5 kg)

Line Voltage Requirements

Component	Current 120 V	Current 240 V	Watts
File System Controller	3A	1.5 A	—
MSi/Gateway Computer	5.0 A	3.0 A	—
MSi Monitor	1.5 A	0.75 A	—
MSS 8000 Server	10.0 A	5.0 A	595 W
Fibre Channel Switch			
8 port	1.5 A	0.75 A	100 W
32 port	3.0 A	1.5 A	200 W
Palladium Store 1000	3.0 A	1.5 A	250 W
ConnectPlus 1000	3.5A	1.75A	

E **Specifications**

Appendix F
Regulatory and Safety Notices

Warnings and Cautions

⚡ **Never install equipment if it appears damaged.**

⚡ **Disconnect the power cord before servicing unit.**

⚡ **Only perform the services explicitly described in this document. For services or procedures not outlined in this document, speak with authorized Avid service personnel.**

⚠ **Follow all warnings and cautions in the procedures.**

⚠ **Operate the device within its marked electrical ratings and product usage instructions.**

FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Shielded cables must be used to ensure compliance with the FCC Class A limits.

Canadian ICES-003

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for the radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications. Le present appariel numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numerique de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

European Union Notice

C E

Declaration of Conformity
(According to ISO/IEC Guide 22 and EN 45014)

Application of Council Directives:	73/23/EEC, 89/336/EEC.
Standards to which Conformity is Declared:	EN60950:1999 Third Edition CISPR 22:1997 / EN55022:1994 + A1:1998 + A2:1998 Class A EN55024:1998/EN61000 — 3-2, 4-2, 4-3, 4-4, 4-5, 4-6, 4-11
Manufacturer's Name:	Avid Technology, Inc. 1925 Andover Street Tewksbury, MA 01876, USA
European Contact:	Nearest Avid Sales and Service Office or Avid Technology International B.V. Sandyford Business Center Unit 3, Dublin 18, Ireland

Type of Equipment:	Information Technology Equipment
Product Name:	Products for the Windows NT, Windows 2000, or Windows XP Operating System: Avid Adrenaline DNA, Avid DS Nitris DNA, Avid Equinox Break-Out-Box, Avid|DS, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, NewsCutter, NewsCutter DV, NewsCutter XP, Pro Tools AVoption|V10, Symphony
	Products for the Mac OS X Operating System: Avid Adrenaline DNA, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, Pro Tools AVoption|V10, Symphony, VideoRAID
	Products for the UNIX Operating System: AirPlay, AirSPACE, AirSpeed, DNxchange, VideoSPACE
	Products for MediaNetwork and Workgroups: Avid ProEncode, Avid Unity ISIS, Avid Unity MediaManager, Avid Unity MediaNetwork (includes File Manager), Avid Unity TransferManager, LANserver, LANserver EX, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, MEDIArray ZX, MEDIArray ZX Drive, Nearchive, PortServer, Vixel switches (8100, 7100, 7200, 9100, 9200), Xdeck
Base Model Numbers:	None
Product Options:	All
Year of Manufacture:	2006

(1) Products for the Windows NT, Windows 2000, or Windows XP Operating System: products were tested in a typical Avid Adrenaline DNA, Avid DS Nitris DNA, Avid Equinox Break-Out-Box, Avid\|DS, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, NewsCutter, NewsCutter DV, NewsCutter XP, Pro Tools AVoption\|V10, or Symphony configuration.

(2) Products for the Mac OS X Operating System: products were tested in a typical Avid Adrenaline DNA, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock, MediaDock 2+, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, Pro Tools AVoption\|V10, Symphony, or VideoRAID configuration.

(3) Products for the UNIX Operating System: products were tested in an AirPlay, AirSpeed, DNxchange, or VideoSPACE configuration.

(4) Products for MediaNetwork and Workgroups: products were tested in a typical Avid ProEncode, Avid Unity ISIS, Avid Unity MediaManager, Avid Unity MediaNetwork (includes File Manager), Avid Unity TransferManager, LANserver, LANserver EX, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, MEDIArray ZX, MEDIArray ZX Drive, Nearchive, PortServer, or Xdeck configuration.

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directives and Standards.

George R. Smith, Director of Hardware Engineering

Disposal of Waste Equipment by Users in the European Union

This symbol on the product or its packaging indicates that this product must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you purchased the product.

Australia and New Zealand EMC Regulations

N1709
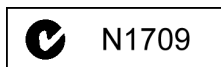
John Kells, Australian Operations Manager
Avid Technology (Australia)
Unit B
5 Skyline Place
French Forest NSW 2086
Australia
Phone: 61-2-8977-4800

Taiwan EMC Regulations

Taiwan EMC Regulations BSMI Class A EMC Warning

警告使用者:
這是甲類的資訊產品,在居住的環境中使
用時,可能會造成射頻干擾,在這種情況
下,使用者會被要求採取某些適當的對策。

Power Supply Cord Notice

English

⚠ **CAUTION - The power supply cord is used as the main disconnect device, ensure that the socket outlet is located/installed near the equipment and is easily accessible.**

German

⚠ **ACHTUNG - Zur sicheren Trennung des Gerätes vom Netz ist der Netzstecker zu ziehen. Vergewissern Sie sich, daß die Steckdose leicht zugänglich ist.**

French

⚠ **ATTENTION - Le cordon d'alimentation est utilisé comme interrupteur général. La prise de
courant doit être située ou installée à proximité du materiél et être facile d'accés.**

Lithium Battery Notice

English

⚠ **CAUTION - Danger of explosion if battery is replaced with incorrect type. Replace only with the same type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.**

German

⚠ ACHTUNG - Explosionsgefahr wenn die Battery in umgekehrter Polarität eingesetzt wird. Nur mit einem gleichen oder ähnlichen, vom Hersteller empfohlenen Typ, ersetzen. Verbrauchte Batterien müssen per den Instructionen des Herstellers verwertet werden.

French

⚠ ATTENTION - Il y a danger d'explosion s'il a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au rebut les batteries usagees conformement aux instructions du fabricant.

English

⚠ CAUTION: This unit has more than one power supply connection; all connections must be removed to remove all power from the unit.

French

⚠ ATTENTION: Cette unité est équipée de plusieurs raccordements d'alimentation. Pour supprimer tout courant électrique de l'unité, tous les cordons d'alimentation doivent être débranchés

German

⚡ WARNUNG: Diese Einheit verfügt über mehr als einen Stromanschluß; um Strom gänzlich von der Einheit fernzuhalten, müssen alle Stromzufuhren abgetrennt sein.

English

⚡ This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).

French

⚠ Attention: Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).

German

⚡ **Warnung: Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß-bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird.**

⚡ **Warning:**

Operating the unit in an equipment Rack, take the following precautions:

-   Make sure the ambient temperature around the unit (which may be higher than the room temperature) is within the limit specified for the unit.

-   Make sure there is sufficient airflow around the unit.

-   Make sure electrical circuits are not overloaded - consider the nameplate rating of all the connected equipment, and make sure you have over current protection.

-   Make sure the equipment is properly grounded.

-   Make sure no objects place on top of unit.

English

⚡ **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

-   This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

-   When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

-   If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

French:

Attention: Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:

-   Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.

- Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.

- Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.

German:

⚡ **Warnung: Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:**

- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.

- Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.

- Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

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