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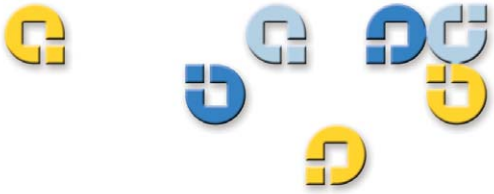

User's Guide User's Guide User's Guide User's Guide User's Guide User's Guide User's Guide

A-Series FTP File Server

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81-81800-04 A01

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Preface

This document serves as an easy-to-use information source to familiarize Quantum customers and systems professionals with the A-Series FTP file server.

Audience

The primary audience for this document consists of end users installing and using the A-Series standalone tape drives (tabletop or rackmount) or configured as part of the SuperLoader 3A Series autoloader.

Purpose

This document provides information about using the A-Series FTP file server including:

- Accessing the FTP file server
- Managing the A-Series tape drive
- FTP file transfers
- FTP client commands

Document Organization

This document is organized as follows:

- Chapter 1, Introduction, provides a brief product overview.
- Chapter 2, Using the FTP File Server, provides information about remote access, FTP file transfer procedures, updating the server and tape drive firmware, and FTP client commands.
- Appendix A, Troubleshooting, provides FTP troubleshooting information.
- Appendix B, FTP Commands, lists the available FTP client commands.

This document concludes with a glossary.

Notational Conventions

This document uses the following conventions:

Note: Notes emphasize important information related to the main topic.

Caution: Cautions indicate potential hazards to equipment and are included to prevent damage to equipment.

Related Documents

Documents related to the Quantum A-Series FTP File Server User's Guide are shown below:

Document No.	Document Title	Document Description
81-81488	Quantum A-Series Tape Drives Quick Start Guide	This guide provides instructions on how to install and setup your A-Series tape drive.
81-81487	Quantum A-Series Tape Drives User's Guide	This guide provides information on using A-Series tape drives.

Document No.	Document Title	Document Description
81-81643	Quantum SuperLoader 3A Series User's Guide	This guide contains information about setting up and using your A-Series autoloader.
81-81237	How to Ship the Quantum SuperLoader	This guide provides information on proper packing for returning the autoloader for repair.

Contacts

Quantum company contacts are listed below.

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Chapter 1

Introduction

Overview

Data backup is essential to protect irreplaceable information. Backing up data to magnetic tape is an easy, cost-efficient method used by many small and medium businesses.

A-Series Tape Drives

The A-Series drives are designed to assist video professionals meet their needs in storing and archiving large video files. The drives store and share all forms of computer data including high definition and standard definition video files for video production and archiving.

Network attachment is supported by a Gigabit Ethernet interface and a built-in FTP client application providing easy file-based operations, such as transferring multiple video files between a drive and any networked server.

The A-Series drives support Material eXchange Format (MXF) files for storage, retrieval, and partial restore of video files, providing the benefits of file-based data tape storage and the accessibility of video tape.

Each media cartridge contains a table of contents providing a hard disk drive-like directory to the tape's file system, allowing complete access to different parts of the tape containing data blocks that make up the files.

The table of contents (TOC) is written to the drive by the built-in server whenever it changes and is stored in a reserved area of the tape upon disconnect of each FTP session.

Chapter 2

Using the FTP File Server

This chapter describes how to access and use the Quantum A-Series FTP File Server for FTP file transfers.

- Getting Started: Setting Up the Network provides information on remote access of the A-Series FTP file server.
- Managing the Tape Drive Using a Web Browser provides information about connecting to the drive, the FTP Server Setup window, the FTP Client Configuration tab, FTP File Transfers, and A-Series Best Practices.
  - Using the Admin Menu Setup Page
  - Using the FTP Client Configuration Tab Settings
  - FTP File Transfers
  - A-Series Best Practices
- Additional Admin Menu Pages provides information about setting the date and time, product versions used in the A-Series FTP server, instructions on how to update the server and tape drive firmware, using the diagnostic log, and how to reboot the tape drive for a system restart.

Refer to Appendix A for FTP troubleshooting information and Appendix B for information about the FTP client commands.

Getting Started: Setting Up the Network

The A-Series tape drive is configured and managed through Web pages accessible by Internet browser software (Internet Explorer®, Safari™, Netscape, or Firefox) installed on the host computer.

Configuring the Tape Drive

There are several options available when configuring the A-Series tape drive within your network. Follow the procedure outlined on the diagram presented in figure 1.

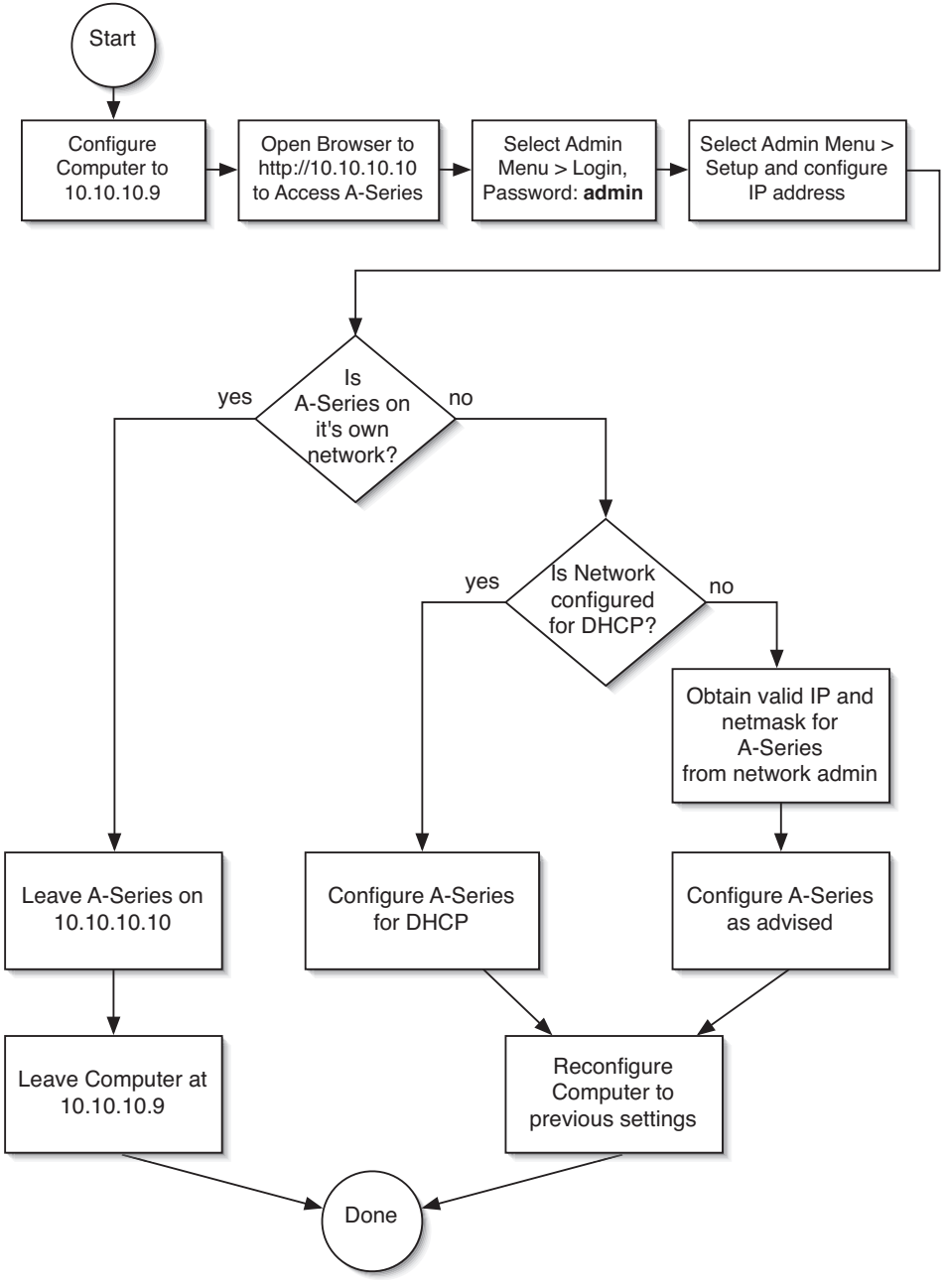
Additional information important for a complete setup procedure may be found in Using the Admin Menu Setup Page on page 19. Note that you will achieve best performance if you can keep the A-Series drive on it's own network. For example, many modern computers have dual Ethernet ports and one can be dedicated to the A-Series.

> **Note:** As of Version 3.0, A-Series drives support Bonjour® (also known as zeroconf) which automatically advertises the host name of the drive on the network. This allows browsers to automatically determine the drive's IP address and greatly simplify network setup.

Depending upon the network and IP configuration of the host computer, it will be necessary to initially reconfigure the IP address and subnet mask of the host computer in order to communicate and recognize the A-Series tape drive on a network.

Please contact your network administrator if you need further assistance in configuring the A-Series tape drive for use on an internal network.

Figure 1 IP Configuration Procedure

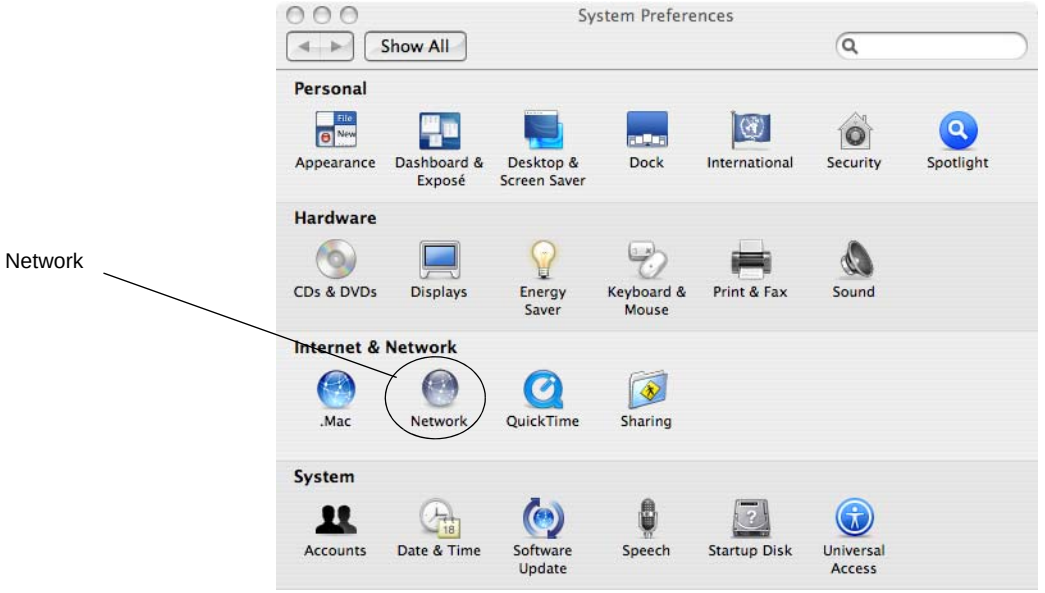


Mac OS® X IP Settings Configuration

Set an IP address:

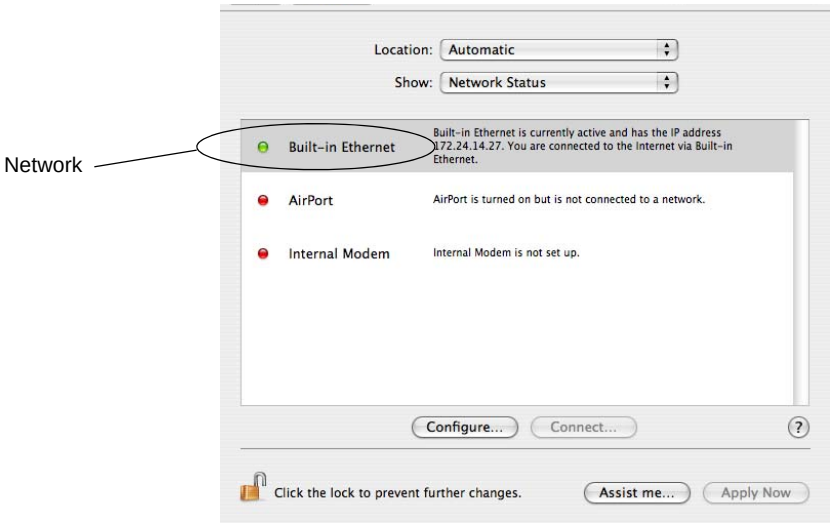
1. From the blue Apple® menu, select **System Preferences**.
2. Select **Network**.

Figure 2 Mac OS X System Network



3. Highlight the **Built-in Ethernet** item and then select the **Configure** button.

Figure 3 Mac OS X System Ethernet Network



4 Select **Manually** in the Configuration IPv4 drop-down box and enter the IP address in the **IP Address** dialogue box.

Figure 4 Mac OS X 10.4
IP Address Settings

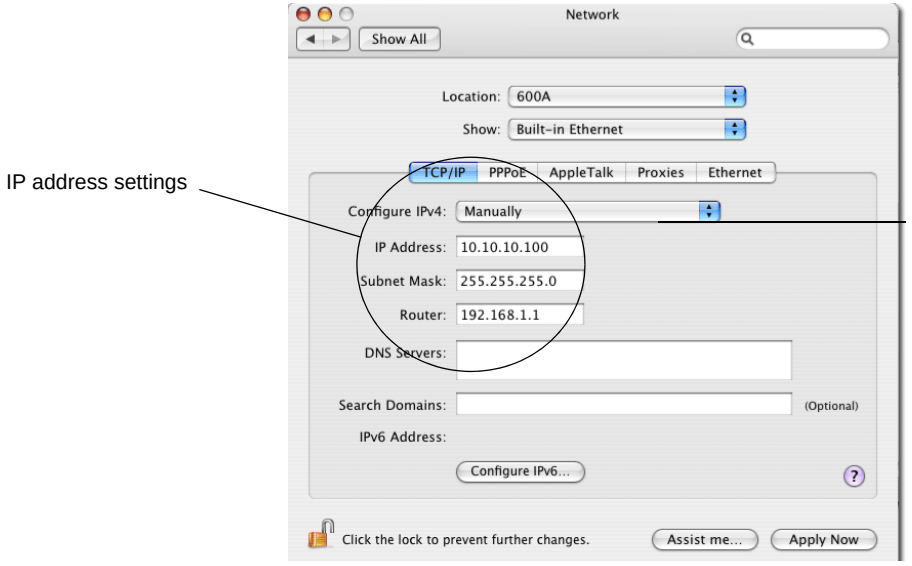


Figure 5 Mac OS X 10.5
IP Address Settings

Windows® IP Settings Configuration

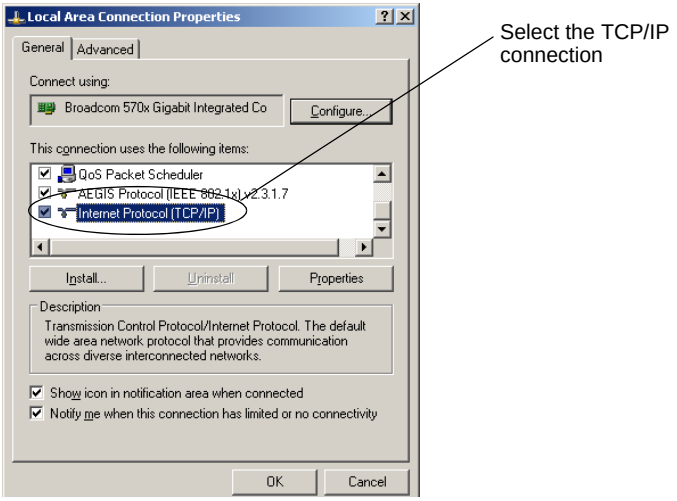
The following steps can be used to setup and communicate with the A-Series tape drive:

1. The host IP configuration may have to be modified to communicate with the drive.

   The factory default IP address for the tape drive is set to **10.10.10.10**.

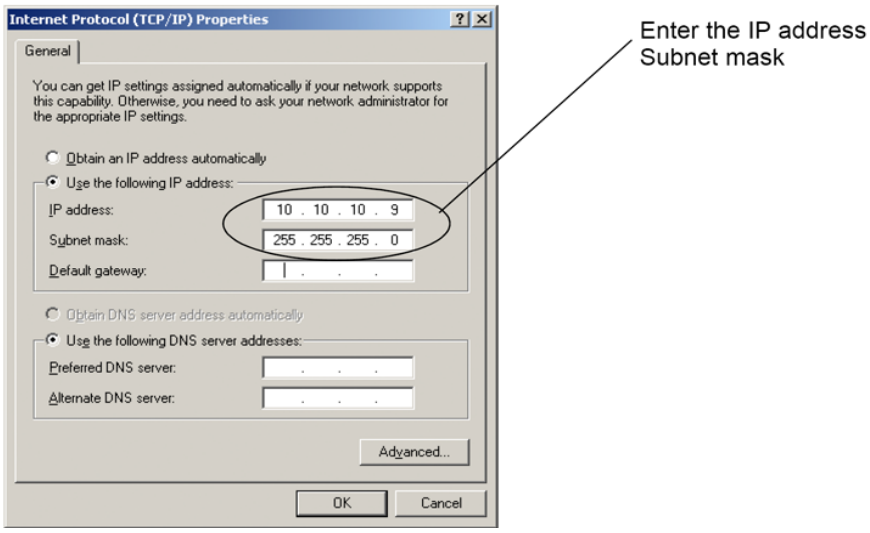
2. Go to **Network Connections** and click the **LAN** icon.
3. Go to **Internet Protocol (TCP/IP) connection** and click **Properties** (see figure 6).

Figure 6 Local Area Connection Properties



4. In the **General** dialogue box (see figure 7), select the radio button **Use the following IP address**.
   - In the **IP address** box, enter **10.10.10.1**
   - In the **Subnet mask** box, enter **255.255.255.0**
5. Click **OK**.

Figure 7 Internet Protocol (TCP/IP) Properties



6 Launch a Web browser (Internet Explorer, Netscape, or Firefox).

> **Note:** For Linux — Configure using the following:
> **ifconfig eth0:1 10.10.10.9**
> For Mac — Configure using **System Preferences**, **Built-In Ethernet,** and **Manually 10.10.10.10**.

Linux IP Settings Configuration

To configure the IP address of the first Ethernet port on a Linux system from a terminal window, type the following command:

ifconfig eth0:1 10.10.10.9 up

The following is a sample Linux terminal session showing local IP settings, an FTP session, and a Telnet session with an A-Series drive.

```
[user@host ~]$ su -l
Password:
[root@host ~]# ftp 10.10.10.10
ftp: connect: Connection timed out
ftp> quit
[root@host ~]# ifconfig eth0:1 10.10.10.9 up
[root@host ~]# ftp 10.10.10.10
Connected to 10.10.10.10.
220---------- Welcome to SDLT 600A ----------
220-You are user number 1 of 1 allowed.
220-Local time is now 00:52. Server port: 21.
220 You will be disconnected after 15 minutes of
inactivity.
500 This security scheme is not implemented
500 This security scheme is not implemented
KERBEROS_V4 rejected as an authentication type
Name (10.10.10.10:root):
331 User root OK. Password required
Password: *****
230-This server supports FXP transfers
230 OK. Current directory is /
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> quit
[root@host ~]# telnet 10.10.10.10
Trying 10.10.10.10...
Connected to 10.10.10.10 (10.10.10.10).
Escape character is '^]'.
SDLT 600A Interface
Password: *****
0 SDLT 600A Management ->
```

```
1 SDLT 600A Client ->
r Restore all previous values
s Save all changes
b Reboot
q Logoff
Enter option: q
Connection closed by foreign host.
[root@host ~]# ifconfig eth0:1 down
[root@host ~]#
```

Managing the Tape Drive Using a Web Browser

The only software required on your system is any Internet browser and a Java™ Plug-in. The **Java Plug-in** is the virtual machine software that allows the execution of Java applets.

The Java Plug-in

Each A-Series tape drive serves a Web page containing an embedded Java FTP client. The Java FTP client needs the Java Virtual Machine to run. This **Java Plug-in** is provided by Sun Microsystems.

Upon user loading of the A-Series Web page, the Java FTP client will install immediately. When you load the Java FTP client for the first time, a display window may ask you to download and install the Java plug-in. If you need that plug-in you can just follow the instructions on the screen or go to www.java.com to download it.

If you have **Java Plug-in** version 1.4.2_xx or later, or the **Java Runtime Environment** version 1.4.2_xx or later installed on your computer, you should not need to download new software. The plug-in should activate on your Web browser automatically once installed.

Since the Java FTP client accesses the local directories of your computer, a certificate of security is required. When the Java FTP client is loaded, the **Java Plug-in** displays a window prompting you to accept our certificate of security.

Figure 8 Certificate of Security

Connecting to the Drive

The A-Series tape drive startup page is available by entering the drive's IP address (or local host name if using Bonjour) in the address bar of a Web browser.

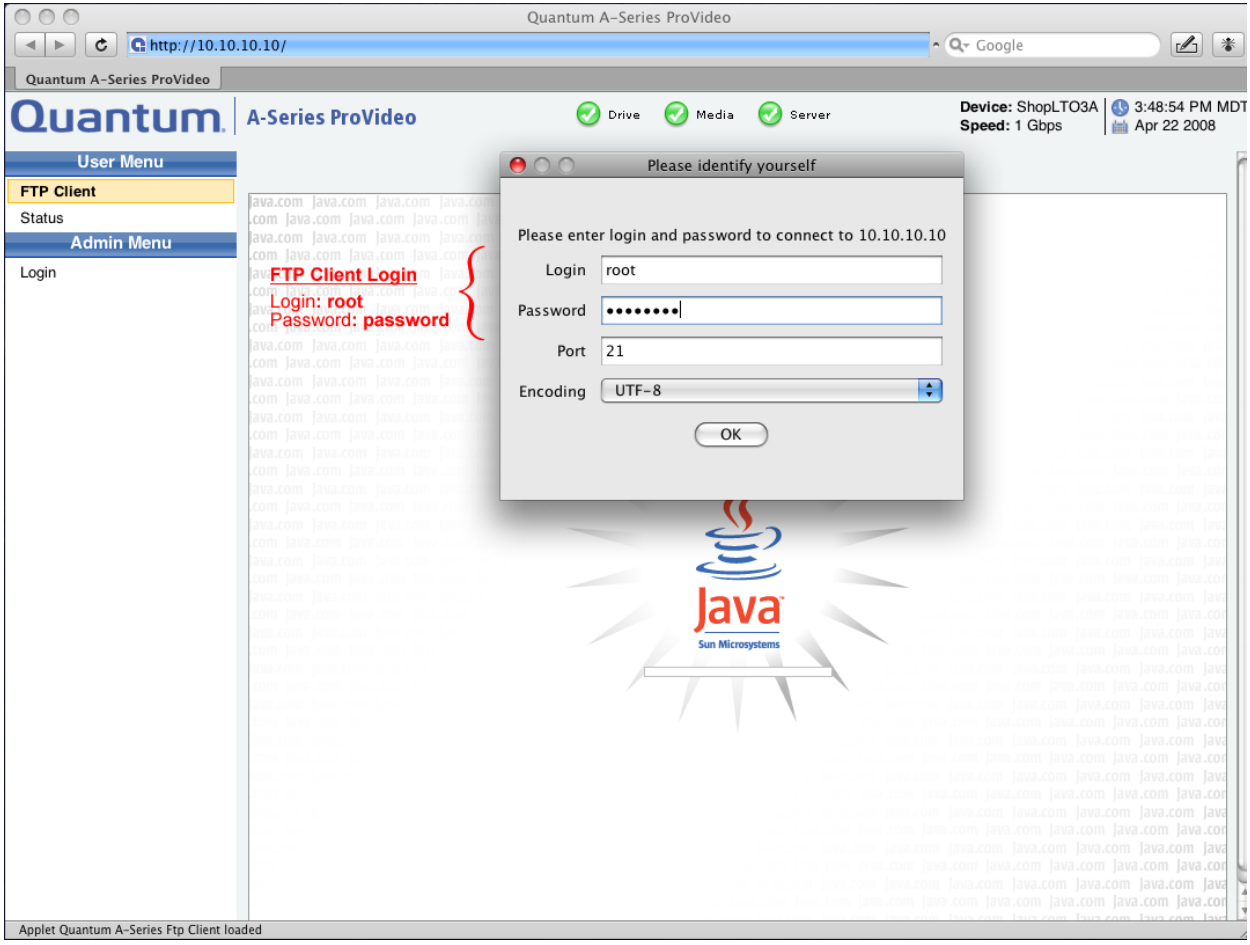
Upon successful connection to the A-Series server, the Web page will load and the Java virtual machine running the FTP client will launch displaying the following screen.

Figure 9 Java Virtual Machine Plug-in

Note: You may see a red "x" instead of this screen - this indicates a Java issue, but it may often be easily resolved by quitting and restarting your browser.

The first time connecting to a drive, the user is presented with a login dialog box (see figure 10). Type the user name: **root** and the password: **password**.

Figure 10 FTP Client Login Dialog

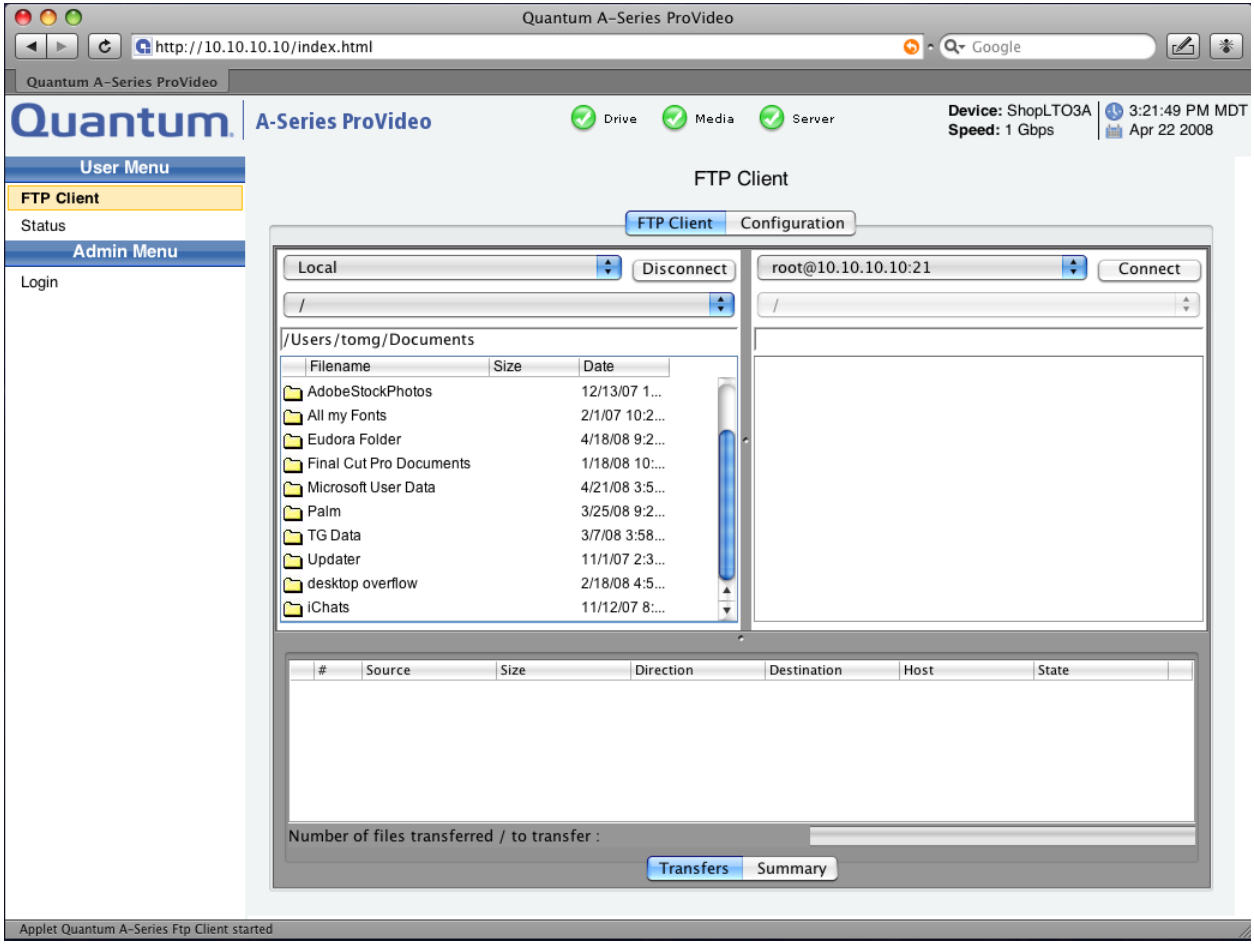


The Login and Password information is retained for each IP address on the local computer.

Note: If you type incorrect login information you will not be able to access the FTP client until it is corrected. Refer to FTP Connection Settings Configuration on page 27 for directions on resetting client login information.

Type in the IP address of the drive (default **http://10.10.10.10**) in the address line of the browser. The start window (**FTP Client**) displays (see figure 11).

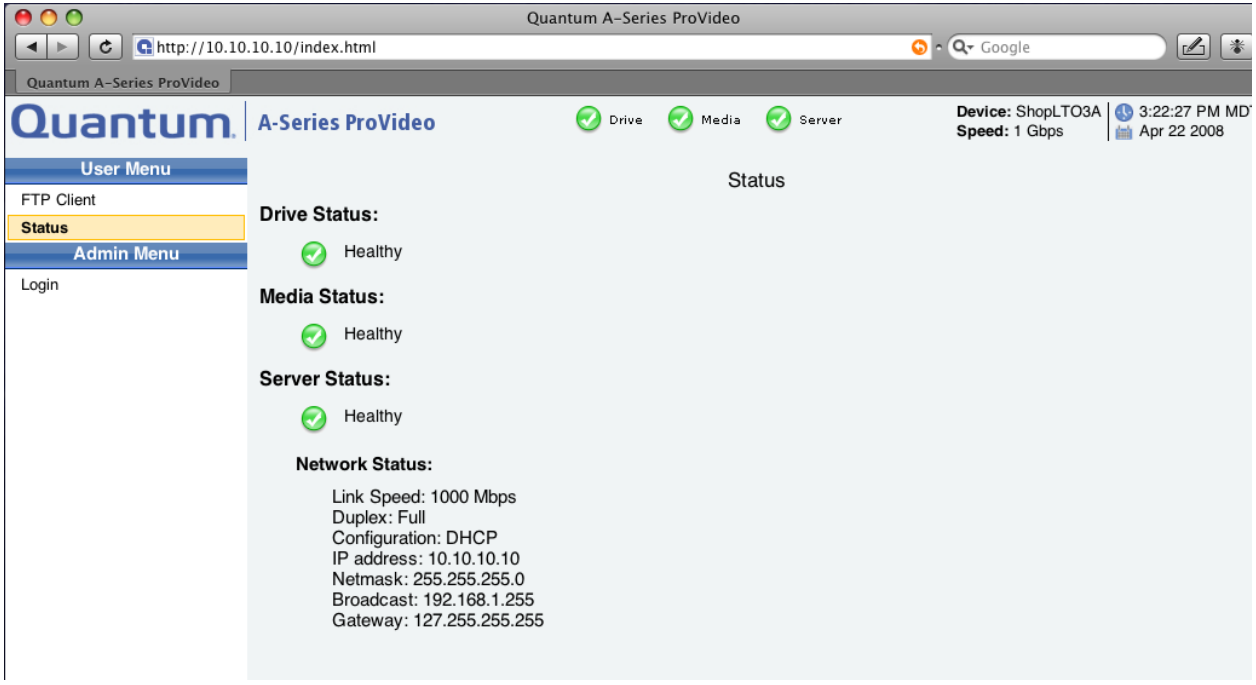
Figure 11 A-Series Home Page



Admin Menu Login

1 From the **Admin Menu**, select **Login** (see figure 13).

Figure 12 Status Page



Note: The three green status lights (**Drive**, **Media**, and **Server**) at the top of the display indicate an operational system with no errors. Detailed status information is available on the **Status** window (see figure 13).

2 In the **Password** box provided (see figure 13), enter **admin**.

Once the correct password is entered, the **Admin Menu** options are fully populated as shown in figure 14.

3 For network configuration settings, select **Setup** (see figure 16) from the **Admin Menu**.

Figure 13 Admin Menu Login Page

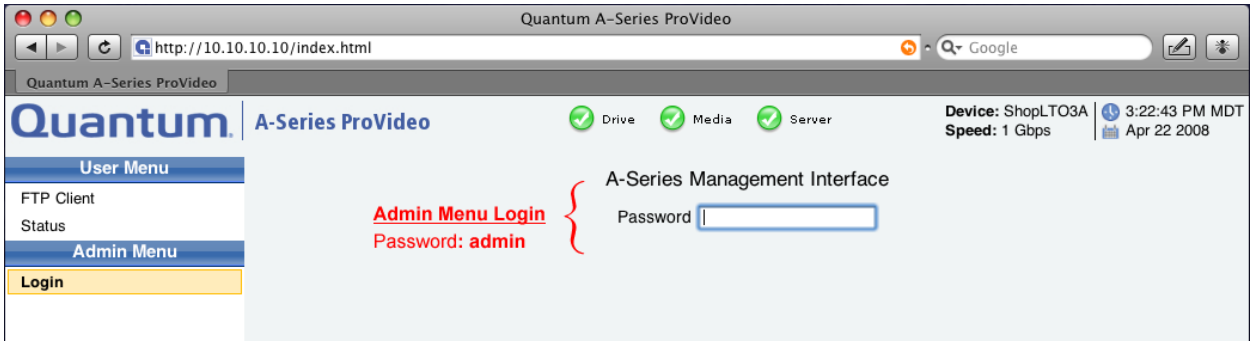
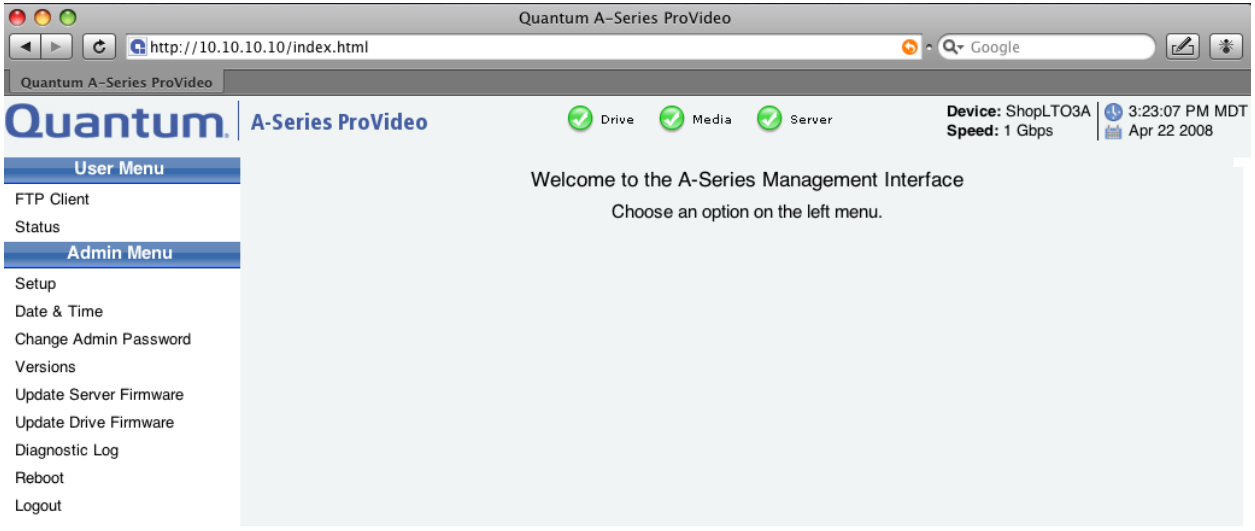


Figure 14 Management Menu After Login



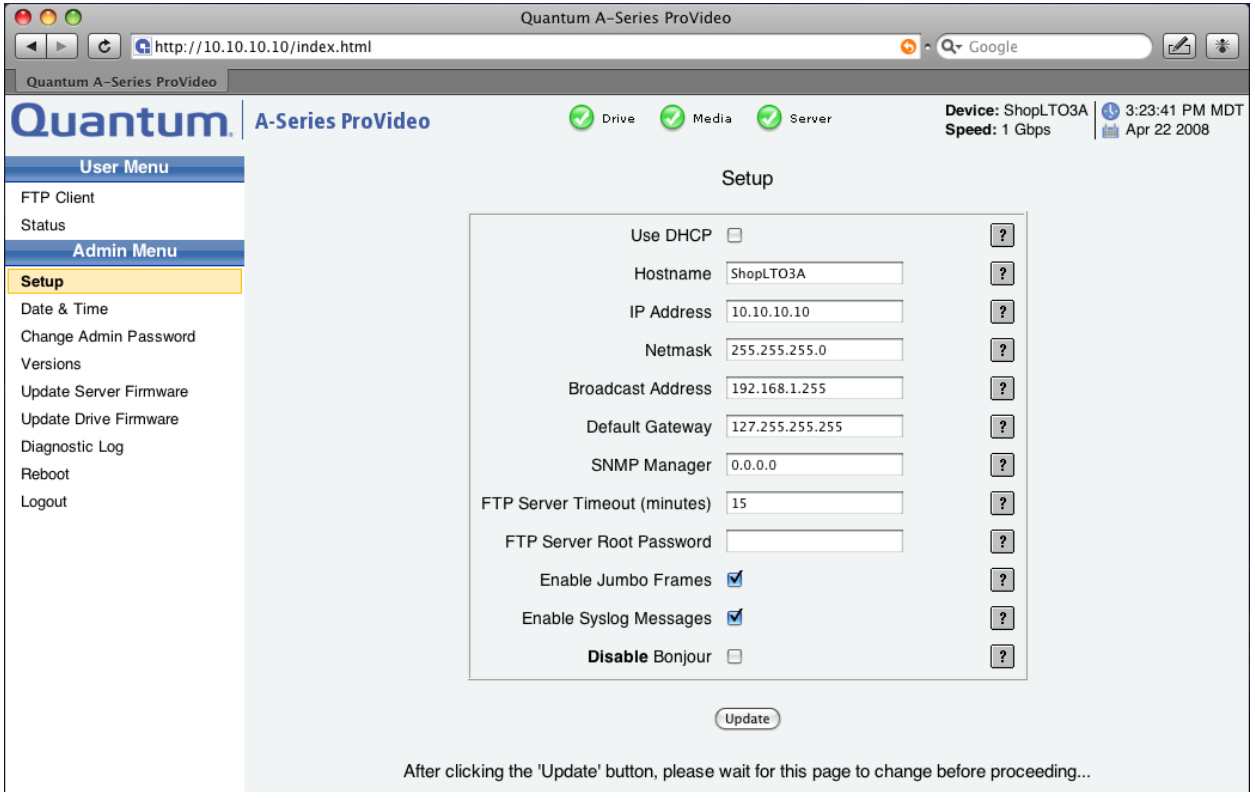
Using the Admin Menu Setup Page

The values shown in the figures that follow are samples and may not represent the current values set in the A-Series tape drive.

Figure 15 System Defaults

Name	Password/Setting
Static IP address	10.10.10.10
Netmask	255.255.255.0
Admin Menu default password	admin
FTP Client login	root
FTP Client default password	password

Figure 16 Setup Window



Use DHCP

Check this box to enable DHCP.

If enabled, the A-Series tape drive attempts to get its network configuration from a DHCP server when it boots. If the device fails to obtain a DHCP address, the value from the IP Address box below is used.

> **Note:** If DHCP is enabled, you must remember the host name and can use it via Bonjour to find the address assigned by the DHCP server. Failure to find the IP address prevents you from accessing the server. Please note that it can take several minutes for the DHCP server to return with an address.

Hostname

Enter a name for the tape drive (the default is **A-Series**). This can be a user friendly name but may not include spaces. The name appears as part of the IQN and will also be passed to the DHCP Server for dynamic DNS updates. For more information, contact your network administrator.

The hostname is also used for the drive's Bonjour advertised network name. Rather than using the IP address in the browser address bar, users can reach the drive by typing **hostname.local.** (where **hostname** is all lower case followed by **.local.**) in the address bar.

> **Note:** When installing multiple drives, be sure each tape drive has a unique IP address and host name.

IP Address

For a manual IP address configuration (DHCP disabled), enter a valid IP address here according to the network configuration. For more information, contact your network administrator.

> **Note:** The IP address *must* be unique; it cannot be in use by another device on the network. Select an IP address that is appropriate for your network environment.

Netmask

Enter the subnet mask for your particular network here. It is advisable to enter a fallback subnet mask when using DHCP in case the DHCP server is unavailable. The default Netmask of **255.255.255.0** will work for most networks. For more information, contact your network administrator.

Broadcast Address

Enter the broadcast address for your particular network here. For more information, contact your network administrator.

Default Gateway

You can enter the IP address of the default gateway for your particular network. Enter a default gateway only if you wish to connect from a network. For more information, contact your network administrator or see other third-party technical references for more details.

SNMP Manager

A Simple Network Management Protocol (SNMP) Manager or SNMP Service is an application that performs the operational roles of generating requests to modify and retrieve management information, and receiving the requested information and trap-event reports that are generated by the SNMP agent. Enter an SNMP address.

SNMP traps for tape alerts are sent after each 1 GB of transfer. They are checked periodically (whether a client is connected or not) when no data is transferring.

FTP Server Timeout (minutes)

Timeout values can be set to automatically disconnect and update the Table of Contents after a period of no activity for the FTP server (and the built-in FTP client, see Configuration tab settings in figure 17).

The FTP server timeout value is set here. The default timeout value is 15 minutes. To avoid disconnect issues, do not set to less than 15 minutes. A

timeout setting of 60 minutes or longer is recommended for SuperLoader 3A Series systems.

In the event the FTP server times out, the error message **Software caused connection abort: socket write error** is displayed at the FTP client.

Note:	In some system configurations, it may be necessary to increase timeout settings if this error is encountered frequently.

FTP Server Root Password

The password for a root user connection can be set using the **FTP Server root Password.** The default login for root user connection is **root** and password is **password**. After setting it, and clicking **Update**, the A-Series tape drive must reboot to change the password.

Enable Jumbo Frames

For Gigabit ethernet networks, you can significantly increase the performance of your tape drive by enabling jumbo frames. Your host computer and all switches and routers in the network path must also support (and have enabled) jumbo frames. Disable this feature if you experience problems storing or retrieving files.

Caution:	Before you enable this feature, ensure that your network supports jumbo frames. If a single network component between the A-Series device and the host PC does not support jumbo frames, you may be unable to access the drive (or transfer speed performance may be severely degraded) after enabling this feature.

Enable Syslog Messages

If you encounter problems with your A-Series tape drive, setting this flag can generate useful information for the Quantum Customer Support team. Once enabled, simply perform the task causing problems and send the resulting log to Quantum Customer Support.

Note:	In Server v3.0.0 we recommend leaving this box checked.

Disable Bonjour

Bonjour is a facility which advertises the drive's hostname over the local area network and should never cause problems. However, this check box is provided to disable this feature if needed due to your unique networking requirements. For more information see A-Series FTP Client on page 31.

Mac OSX systems come with Bonjour enabled and all Windows systems which have had iTunes installed also support Bonjour. To add Bonjour to Windows systems that do not have iTunes, go to:

http://www.apple.com/support/downloads/bonjourforwindows.html

Bonjour hostnames also work with Linux and Unix systems which have **zeroconf** configured.

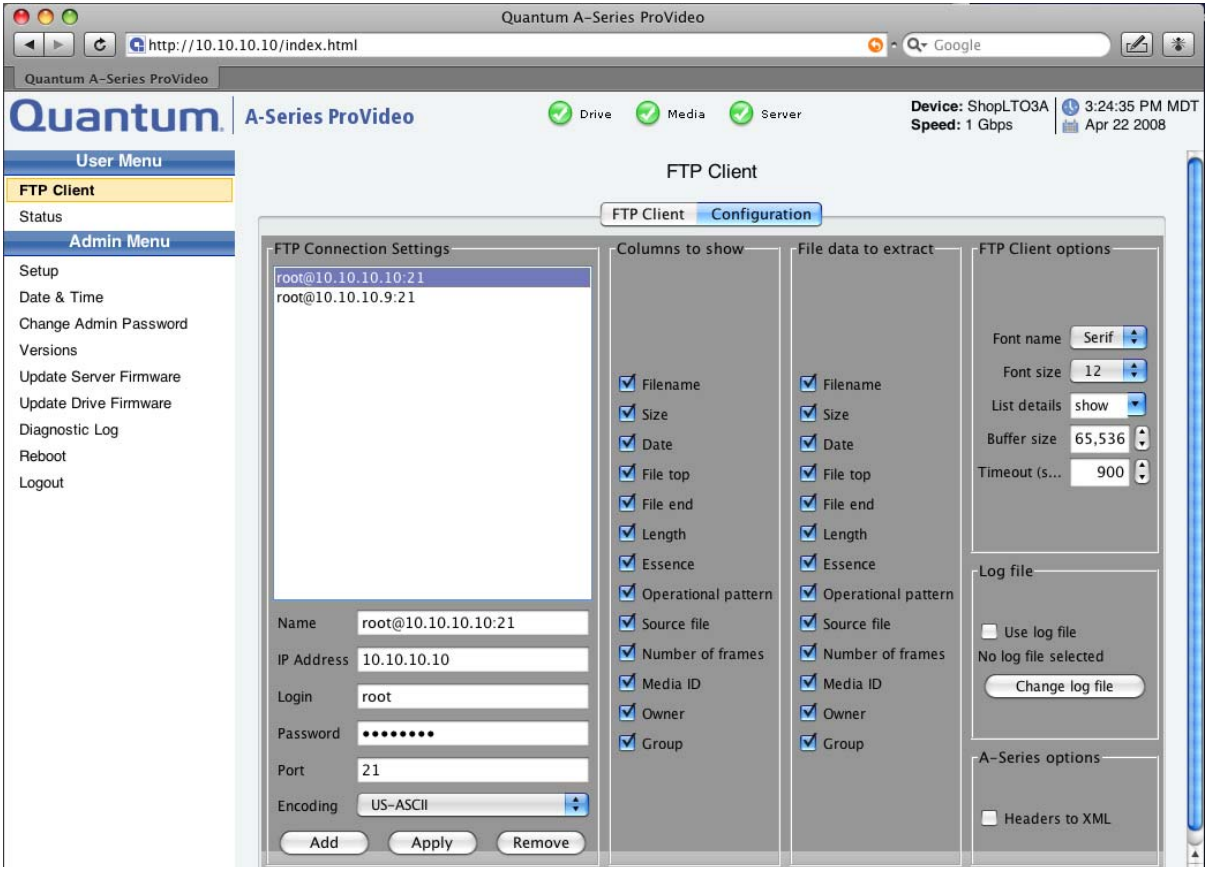
Update Button

The user must select the Update button and then reboot the drive as noted in the resulting message for any changes to this page to take effect. Reboot by selecting the **Reboot** item in the left column list and confirming **OK** in the resulting dialog.

Using the FTP Client Configuration Tab Settings

The **Configuration** tab contains four columns (see figure 17). The left column allows you to manage the list of servers. The next three columns (**Columns to show**, **File data to extract**, and **FTP Client options**) are configuration options for metadata and FTP client parameters.

Figure 17 Configuration Tab Display



List of Servers Management

The first time you connect to any FTP server, the A-Series client prompts you for the login and password to connect to that FTP server. The login name and password you provide are stored with the IP address on the local computer and appear in the FTP Connection Settings column.

Root User Connection

The default login for root user connection is **root** and password is **password**. This server is the first added in the list of servers. The password for root user connection can be changed from this default in the **Setup** page (see Managing the Tape Drive Using a Web Browser) using the **New root's password** (the user name for the login with file transfer privileges must always be **root**).

Guest User Connection

The login for guest user connection is **guest** and password is **guest**. The password for guest user cannot be set in the **Setup** page.

> **Note:** The built-in A-Series FTP server does not support anonymous connections. Only a root user (password is **password**) and up to five guest users (password is **guest**) are supported.

Connecting to a New Server

You can connect to a new server by typing that server's IP address into the browser address bar or simply update the list with its IP address, login, and password; then click **Add**. To remove a server from the list, select it and click **Remove**.

> **Note:** The FTP server serving the current Web page was automatically added to this list when you first connected as described in Managing the Tape Drive Using a Web Browser.

Within the **FTP Client** tab, choose the name of the server you want in the combo box on the top of a pane.

> **Note:** Your list of servers is saved locally on your computer.

If a remote server cannot be connected, the following window displays.

Figure 18 FTP Server Connect Error Window

Setting Client Login Information

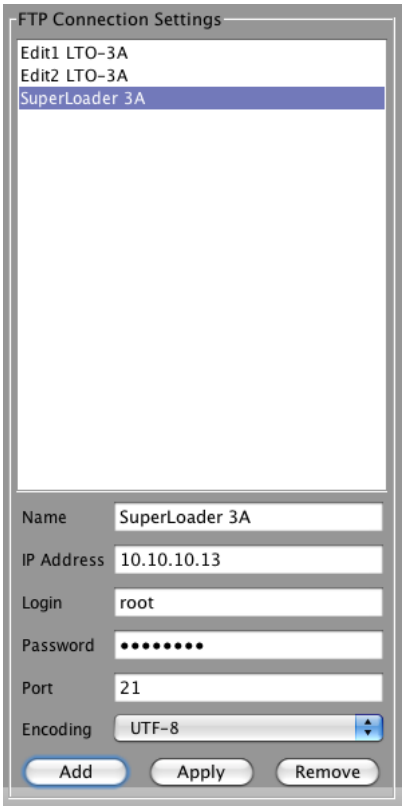
Each FTP server to which you have connected appears in the column by **loginname@IPaddress:portnumber** (default for any A-Series will be **root@10.10.10.10:21**). This name also appears whenever you are connected at the top of the column listing that server's contents in the FTP client.

If you have several FTP servers it is good practice to name them something useful using the **Name** text box and select the **Apply** button to save it (see figure 17).

If you mistyped either the user **Login** or **Password** when connecting, you will not be able to connect to your FTP Server without correcting these entries. That information can be fixed using this **FTP Connection Settings** column.

First select the FTP server in the column to highlight it and then retype the information to be amended below in the **Login** and **Password** text boxes and finally select the **Apply** button to save your changes.

Figure 19 FTP Connection Settings



FTP Connection Settings Configuration

Name — identifier of the FTP server automatically supplied but may be any user typed text value

IP Address — network IP address of the FTP server

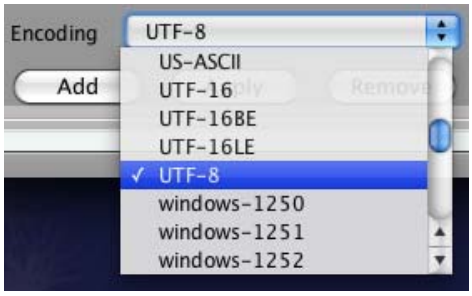
Login — login to the FTP server: always root for A-Series servers

Password —password to the FTP server

Port — port of the FTP server: FTP server ports are by definition port 21; this value should only be changed for unusual FTP servers which operate on other ports

Encoding — Specifies the encoding scheme of a connection in order to support FXP transfers between two servers with different encoding schemes. All encoding schemes available from the Java Runtime Environment (JRE) — even those that do not work with the A-Series FTP server — are displayed in order to work with servers that would support them (see figure 20). The default is UTF-8 (this will work best for A-Series servers in cross platform environments).

Figure 20 Encoding Schemes



Multiuser Connection

The system allows six users to be logged on at a time to the A-Series tape drive. Although six users may be logged on, only three root users can connect at a time from a single IP address. All other users must be logged in as user: **guest**, password: **guest**. A root user can operate all the features of the A-Series, while the guest user can only read the cartridge directory (file system table of contents).

> **Note:** Multiple root user connections allow a single workstation to connect both through the Web FTP client and other means such as through the file system (i.e. on a Mac OS, through the **Go>Connect to Server... menu item**). Users may experience errors if such connections attempt simultaneous actions.

When a disconnection of all the root connections from the A-Series occurs (e.g. by ejecting the tape or by disconnecting), the tape rewinds if the file system table of contents has been modified since the last connection. You cannot reconnect as root to the server until the directory update is completed. A guest connection is allowed.

Several FTP commands are not allowed for a:

- Guest connection
  - **ACKNOWLEDGE ERROR, DELE, MKD, RMD, RETR, STOR, RNTO, SITE DELE, SITE EJECT, SITE ERASE, SITE HEADER, SITE PARTIAL, SITE RELEASEMEDIA, SETMEDIUMID**
- Root connection while another root transfers on the same path
  - **DELE, RMD, RETR, STOR, RNTO, SITE DELE, SITE EJECT, SITE ERASE, SITE RELEASEMEDIA, SITE SETMEDIUMID**

..

Note: When several root users are connected, be aware that all operations are not allowed in parallel at the same time.

Note: If three root users are already connected, and you try to connect as a root, the following FTP error window displays (see figure 21).

Figure 21 FTP Server Root User Error Window

Columns to show

These checkboxes specify what you want to see in the columns of the panes (**FTP Client** tab) in the list of files.

File data to extract

These check boxes specify what information you want to extract when you select **File properties** on the MXF files. You can click **File properties** in the **Contextual** menu.

FTP Client Options

Font name — Specifies the font used in the FTP client lists and reports. The default is **Arial** (this font does not allow for display of Japanese characters).

Font size — Specifies the font used in the FTP client lists and reports size of the character policy. The default is **12**.

List details — Specifies whether (show) or not (hide) hidden files appear in FTP server lists and in the transfer list.

You can set two connection specifications:

- **Buffer size** — Specifies the size in bytes of the buffers used by the FTP client to send or receive data on the network. **65536 bytes** is selected by default. You can modify the buffer size by entering a new value after selecting the current value in the dialog box.

  > **Note:** This option has no effect on other servers not using this application.

  The optimal file size is 65,536 bytes, but you may also have to configure the settings on your network card to forward blocks of 65,536 bytes on the network. Ensuring that these two settings are set is the only way to have the best transfer rate.

- **Timeout (sec)** — Specifies the timeout of the built-in FTP client session in seconds. The default value is **900** seconds (15 minutes). The session is disconnected after the timeout occurs.

> **Note:** In the event the FTP client times out, the error message **Read timed out** is displayed at the FTP client. In some systems it may be necessary to set longer timeout values.

A-Series options

Headers to XML — Allows you to retrieve the header files of MXF files in the XML text format or in MXF binary format.

FTP File Transfers

The A-Series FTP client GUI is composed of four views, which allow you to select from the corresponding tabs:

- FTP Client Tab Display — This tab allows you to explore local and remote systems and make transfers.
- Configuration Tab Display — This tab shows a list of servers and the FTP Client configuration settings.
- Transfer Progress — This tab shows a list of all files that have been transferred to or from the drive in the current FTP connection session.
- Transfer Summary —This tab shows a summary of each completed transfer session (all files in a single drag and drop operation).

A-Series FTP Client

The A-Series FTP client allows you to transfer files to and from the tape drive, partially restore MXF files, and view the MXF metadata.

Connect to the A-Series client as follows:

In the address bar of your web browser, enter the configured IP address of your drive or use Bonjour.

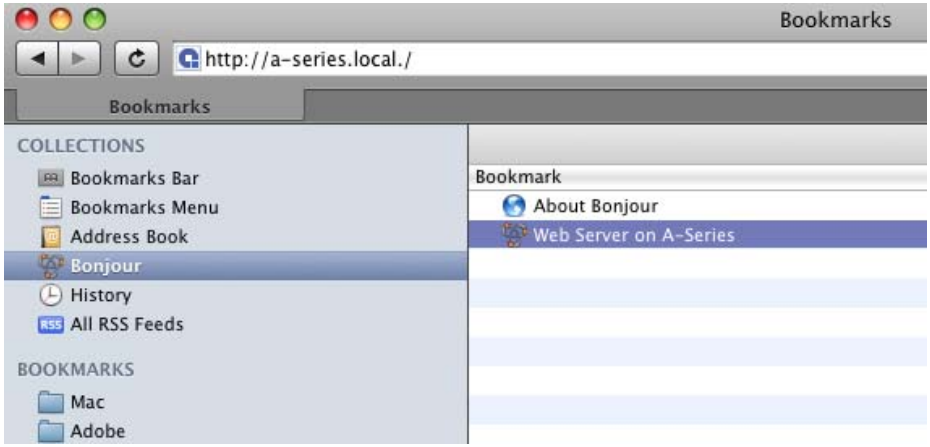
To use Bonjour either:

a Type your configured hostname in lower case followed by **.local.** (e.g. **a-series.local.**) or

b Go to Safari bookmarks, select **Bonjour** and find your A-Series drive from the list of Bonjour devices on your network (see figure 22) - double click on the line showing the drive to connect.

Note: Bonjour bookmarks at this time are only available from the Safari browser so when using other browsers use option **a** above.

Figure 22 Bonjour Bookmarks

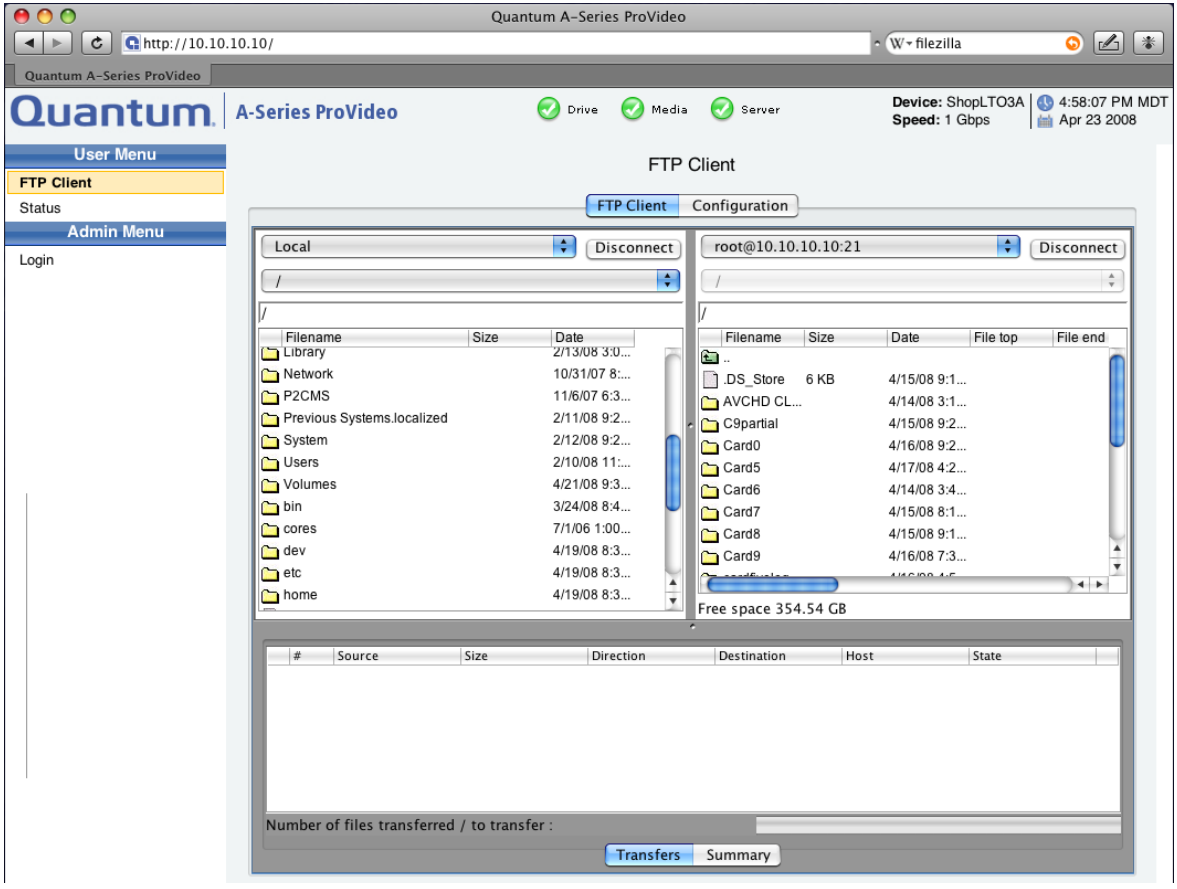


If the Bonjour item is not shown in Safari bookmarks go to the **Safari > Preferences > Bookmarks** dialog and enable your choice of where to **Include Bonjour**

In the A-Series **User Menu**, click **FTP Client**.

As the **FTP Client** page loads, the Java Virtual Machine is started. When the Java Virtual Machine finishes loading and you have successfully logged in, the **FTP Client** window displays (see figure 23). You will be asked to log in if you have not yet done so from the current browser.

Figure 23 A-Series FTP Client



FTP Client Tab

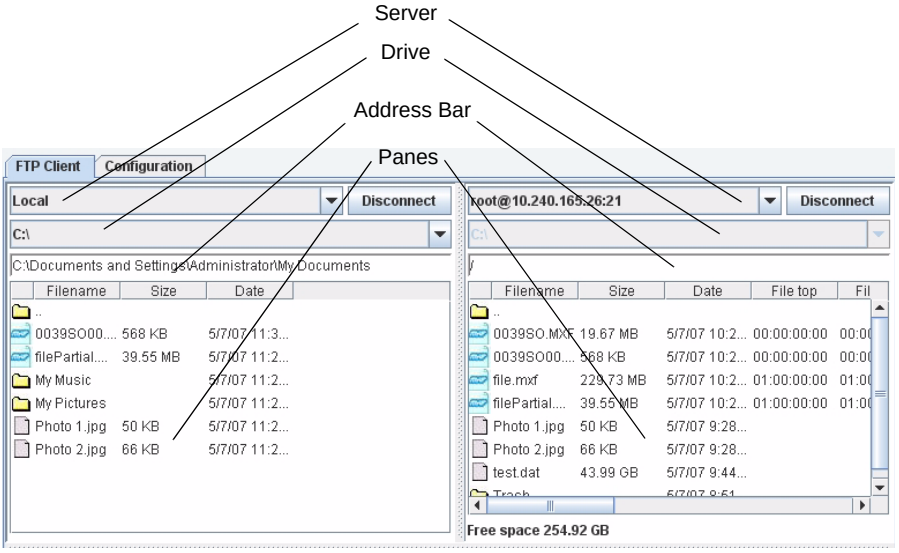
The **FTP Client** tab is the main tab view with a standard FTP client interface, providing two file panes.

You must click the **Connect** button to open a FTP connection to your A-Series FTP server. Figure 23 shows the A-Series FTP client in the connected state.

If the login name and password were entered incorrectly, you can reset to the correct login (**root**) and password (**password**) in the **Configuration** tab (see Setting Client Login Information on page 26).

Once connected, the **Connect** button changes to **Disconnect** and you can click the **Disconnect** button to disconnect from the FTP server at anytime except during file transfers.

Figure 24 FTP Client Tab Display



File Panes

On the top of each pane, there are three text zones:

- The first zone allows you to select the local file system or any configured FTP server.
- The second zone allows you to select any available drive letter (only available on **Local** PC file systems).

> **Note:** On Mac OSX systems, external drives and other mounted volumes may be found under the **/Volumes** directory.

- The third zone displays the currently navigated path and allows you to edit the path within the address bar.

Each pane displays the file system at the location specified in the header zones and you can interact with the system as follows:

- Double-click a folder to move into that folder and view the enclosed folders and files
- Double-click the green Up-arrow folder at the top followed by leader dots to change directories back up to the parent folder
- Click an item (file or folder) to select it
- Use **<Ctrl>** (**<Command>** under Mac OSX) for non-continuous and **<Shift>** for continuous item selection
- Use **<Ctrl** + **A>** (**<Command+A>** under Mac OSX) to select all files and folders
- Use **F2** is supported (allows you to edit the name of the selected file)
- Right-click to see the **Contextual** menu (**<Ctrl+click>** under Mac OSX)
- Click the column headings to change the sorting order
- Drag and drop column headings to change the order in which they appear
- Drag the right edge of any column heading to change its width
- Right-click on any column heading to choose what's displayed (this is a shortcut to the selections in the Configuration tab)

File Transfers

The A-Series FTP client allows you to transfer files from a:

- Computer to/from an A-Series server
- Local computer to/from a non-A-Series FTP server (e.g. Filezilla)
- A-Series server to/from a non-A-Series server (FXP transfer)
- A-Series server to/from another A-Series server (FXP transfer: tape-to-tape copy)

To transfer files, select one or more items in one pane, then drag and drop them to the other pane. For archiving, drag from the local pane to the A-Series pane. For restoring, drag from the A-Series pane to the local pane. You can also reorganize files by dropping selections on the Up-arrow folder or other folders of the same pane, local or remote as an alternative to the Move command (see figure 35).

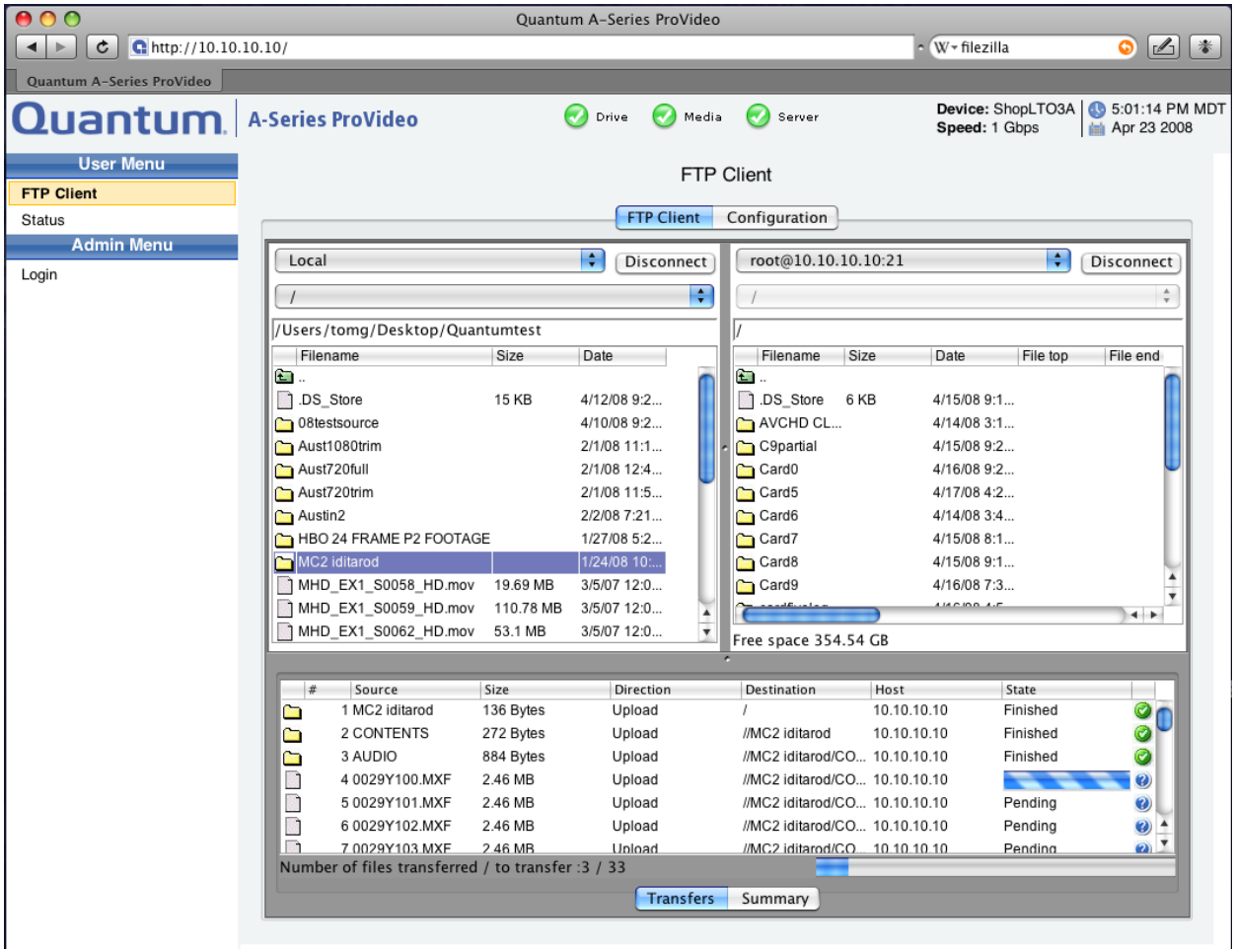
When transferring large files maximum transfer rates may be achieved. When transferring files of less than 4 MB, you will see degraded drive transfer rates.

> **Note:** The maximum native storage capacity of the SDLT 600A cartridge is 300 GB and the LTO-3 A-Series is 400 GB. A-Series drives contain hardware to provide automatic lossless compression if file sizes can be reduced. Most video files will not compress further, but many other file types may allow you to get much more than the stated native capacity on a tape.

Transfer Queue Tab

Once a transfer is initiated, the bars next to each item in the transfer list show the transfer progress—when the indicator is striped or moving back and forth, the tape is seeking, and once data copying actually begins the bar shows the progress (see figure 25).

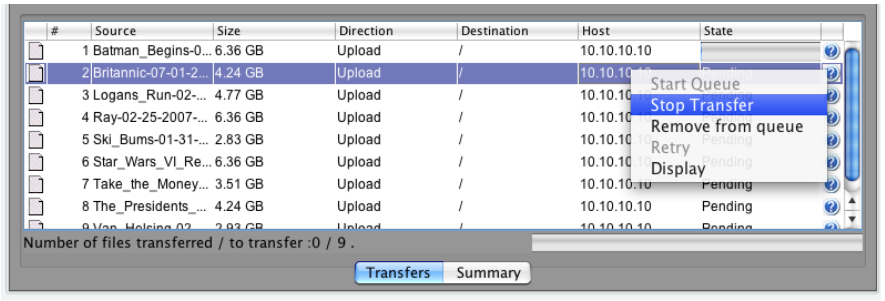
Figure 25 Transfer Progress



The queue lists the files to transfer as well as the status of the transfer. By selecting a file from the list and then right-clicking it (see figure 26), you can:

- Start the transfer queue
- Stop the file transfer
- Remove the file from the list
- Retry the operation
- Display the file transfer properties

Figure 26 Stop Transfer Selection

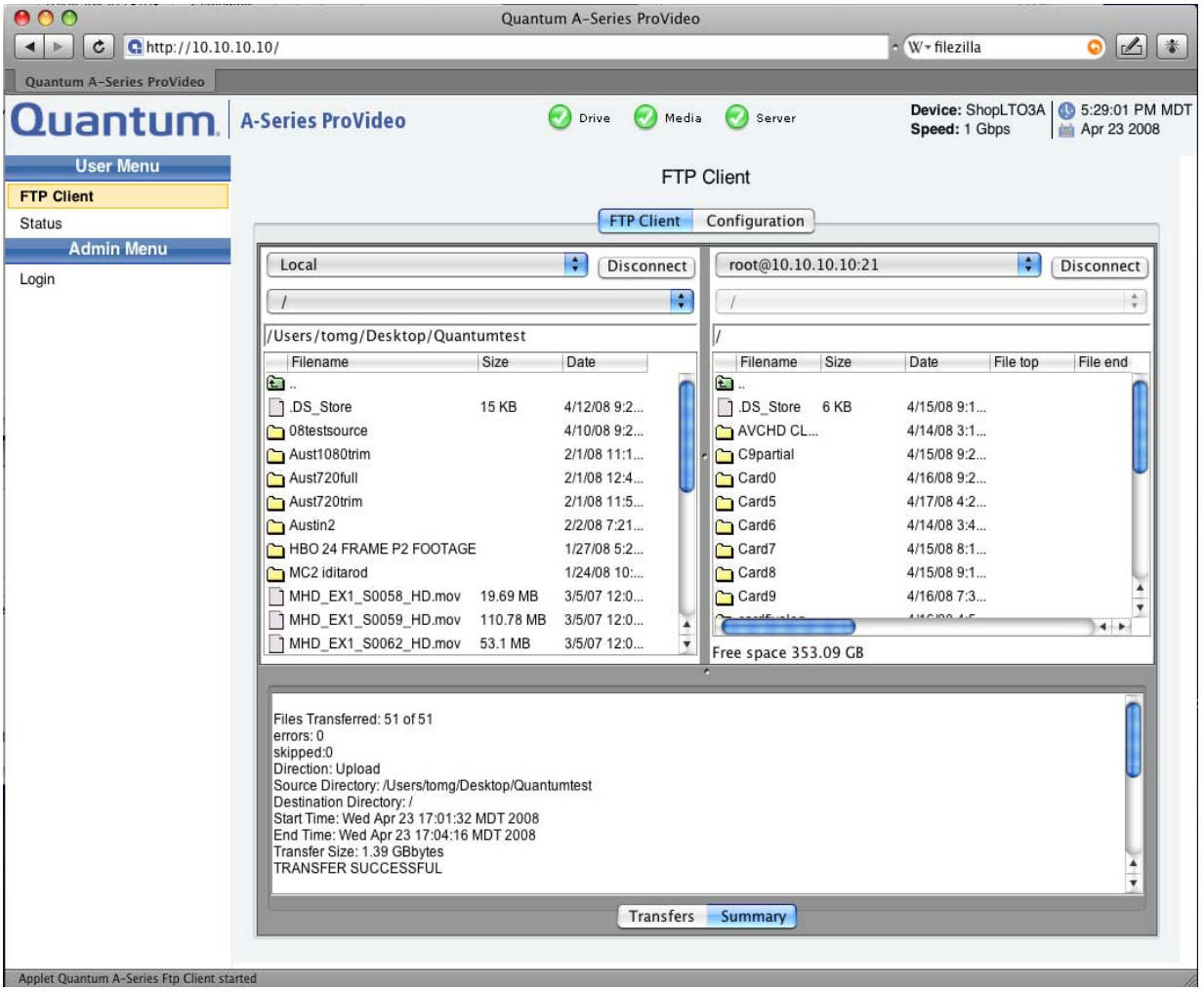


Note: When you perform a transfer between two remote servers, a procedure called **Server to server** or FXP (**File eXchange Protocol**), data is transferred directly from the source remote server to the target remote server, without routing this data through the client's workstation. The client has no indication of the exact progression.

Transfer Summary Tab

A sequence of file transfers stops when the Transfer queue list is completed or an unrecoverable error is encountered. When file transfers stop, the display automatically switches to the Summary tab, displaying full information about the most recent transfer (see figure 27).

Figure 27 Transfer Summary

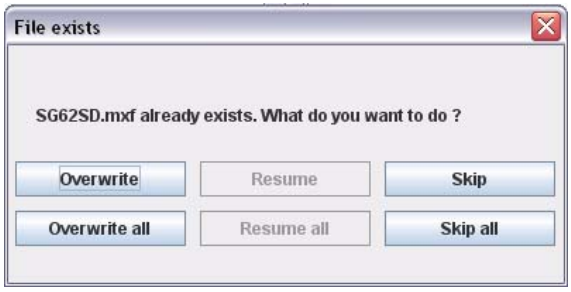


> **Note:** File transfer summaries show total number of bytes transferred using the Unix/Linux totals compiled from each file's **ls -l** representation. These totals may not exactly agree with the number of bytes reported by Finder or Windows due to differences in calculation methods.

Duplicate File Name

When you transfer one or more files and there is already a file with the same name in the destination, there is a conflict and the following window displays:

Figure 28 File Exists Window



- **Overwrite/Overwrite all** — Deletes the file already on the target and copies the new file in its place. Overwrite will replace only the current file. Overwrite all will apply the command to every duplicate file name in the Transfer queue.

> **Note:** When you overwrite a file on an A-Series drive, it is not erased from the tape, because the tape drive appends data only (unless the file to overwrite is the last file stored on the tape), however it is not possible to access the overwritten file. Files overwritten on hard disk destinations are in fact erased.

> **Note:** The A-Series does not support **Resume**.

- **Skip/Skip all** — Continues the transfer for other selected files without overwriting the specified file(s). **Skip** will skip only the current file. **Skip all** will apply the command to every duplicate file name in the Transfer queue.

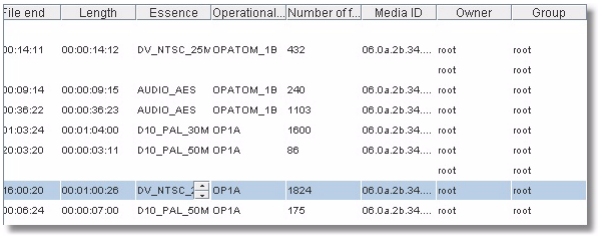
Information Within the Panes

In addition to the information about a file (size, date, and so forth), metadata information relative to the MXF files (file top, file end, essence, and so forth) is provided within the pane.

> **Note:** You can select which metadata columns to display in the **Configuration** tab.

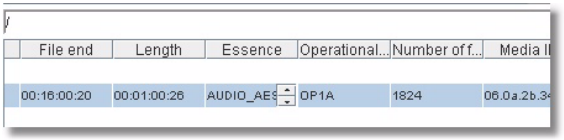
Figure 29 shows additional metadata columns which can be viewed by moving the slider at the bottom of the pane to the right.

Figure 29 Additional Metadata Columns



Each MXF file's metadata may contain information for several essence types (e.g. video essence, audio essence) and you can display the associated metadata by clicking the selector within the **Essence** column, as indicated in figure 29 and figure 30.

Figure 30 Audio Essence Metadata

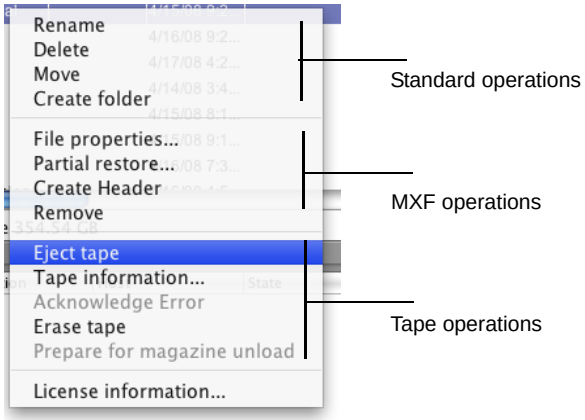


Contextual Menu

A **Contextual** menu allows you to control operations on the selected items. This menu appears when you right-click within the directory pane or on a file.

The zone on top of the **Contextual** menu (see figure 31) is for standard operations available on all systems (Local A-Series, or other FTP server). The other two zones present operations that are only available on A-Series drive panes (MXF operations, tape operations).

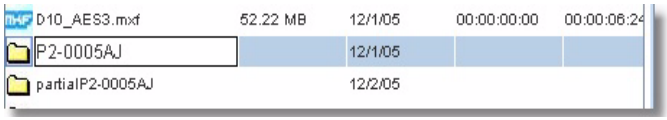
Figure 31 Contextual Menu



Standard Operations

- From the **Contextual** menu, the **Rename** selection allows you to rename the selected folder. Enter the new name (see figure 32). To cancel the procedure, type **<Esc>**.

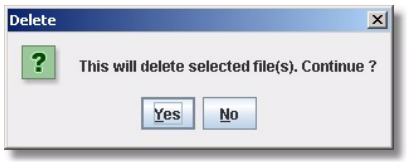
Figure 32 Renaming Files or Folders



- From the **Contextual** menu, the **Delete** selection opens a window (see figure 33) to confirm the deletion of files. Once the deletion is confirmed, the deleted file or deleted folder contents is moved into the **Trash** folder. The **Trash** folder is a system folder located at the root

of the file system (i.e. **/Trash**). It cannot be deleted. Deleting a folder deletes all the files within the folder as well as any subfolders and their corresponding files. After a folder is deleted, Trash will contain all deleted files but not the folder that they were in.

Figure 33 Delete Window



Note: The **Trash** folder (see figure 34) shows the list of files that you have deleted. When you delete a file, it is not entirely deleted from the tape, but rather, it is moved to the **Trash** folder. Therefore, it is possible to "undelete" files from the **Trash** folder by moving the file back to its original location using the **Move** command or by dragging and dropping the file(s) onto the up-level green folder.

When a file is deleted and the same file is already located in the **Trash** folder, the second instance of file is renamed with **<filename>xyz.extension**. *xyz* starting with 000.

Since the maximum number of characters of the filename is 97 (including the extension), if the deleted filename is greater than 94 characters long, the second instance of file is renamed with **<truncated filename>xyz.extension** (**<truncated filename>** means the last three characters of the filename are truncated).

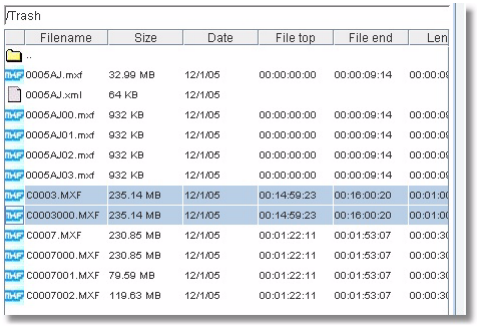
Note: Items may be placed in the **Trash** either with the **Delete** command or the **Move** command (the same as moving by drag and drop onto the **Trash**).

Deleting files differs from moving files to **Trash** as follows:

- If you **Delete** a file where a file with the same name is already in the **Trash**, it will be renamed as described. If you try to **Move** it instead you will get an error message because the name is not unique.

- If you **Move** a folder to the **Trash**, the entire folder is moved. If you **Delete** it, only the files are moved to **Trash** and the folder(s) no longer exist.

Figure 34 Retrieving Files From the Trash Folder



- From the Contextual menu, the **Move** selection opens a window (see figure 35) to specify the destination of the file or folder. The **Move** selection supports an absolute pathname, that is, you can enter a full pathname in the dialog box to set the destination of the file or folder.

Note: The **Trash** folder and up-level folders cannot be moved.

Figure 35 Move File Window

Note: This operation can be useful to undelete a file.

Enter the destination folder name.

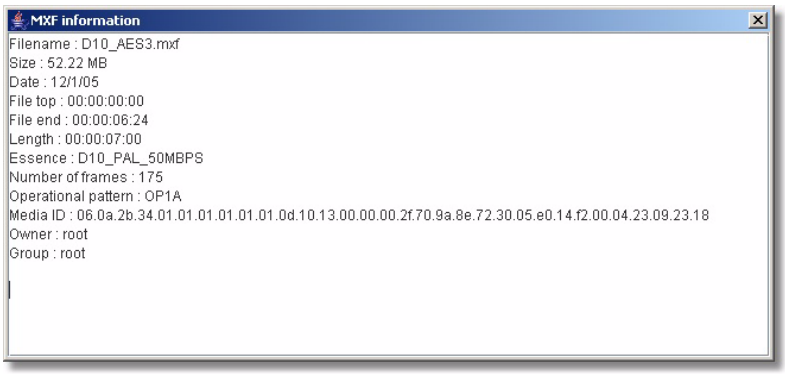
- From the **Contextual** menu, the **Create Folder** selection opens a window (see figure 36) to specify the new folder. The **Create Folder** selection supports an absolute pathname, that is, you can enter a full pathname in the dialog box to set the destination of the file or folder.

Figure 36 Create Folder Window

- From the **Contextual** menu, the **File properties** selection (see figure 37) opens a window showing the metadata of all MXF files selected:
  - Filename
  - Filesize
  - Last modification date
  - Starting time code
  - Ending time code
  - Duration in time codes
  - Video essence type(s)
  - Number of video frames
  - MXF Operational pattern
  - MXF Unique Media Identifier (UMID)
  - Owner
  - Group

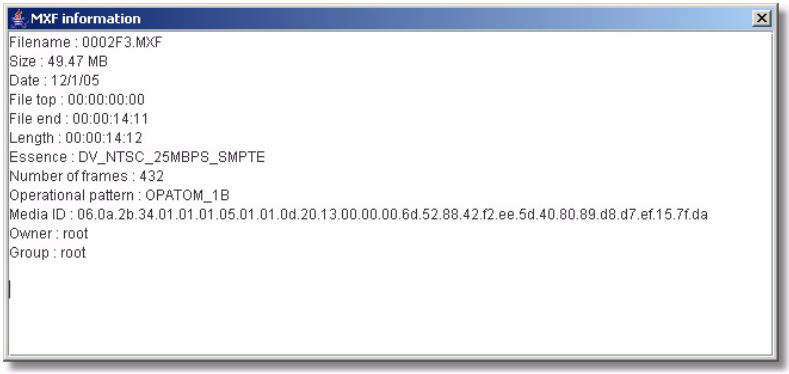
Note:	Multiple file selection is supported.

Figure 37 MXF Information of D10 PAL Essence



Note: The A-Series supports different video essences (see figure 38) and MXF operational patterns.

Figure 38 MXF Information of DV NTSC Essence



- From the **Contextual** menu, the **Partial restore…** selection opens a window to do a **Partial restore** of a selected MXF file.

Partial Restore

Partial restore allows you to define and later restore a part of an MXF AV file (subclip access by timecode) stored on the tape, that can be defined by the **Starting time code** and **Ending time code** or **Starting time code** and **Number of frames**.

The **Partial restore** feature is currently only supported for MXF OP1A and OPATOM operational patterns and only with I-Frame (not long-GOP) video essence types. The **Partial restore** procedure for OP1A and OPATOM MXF files differs slightly from each other due to the fact that

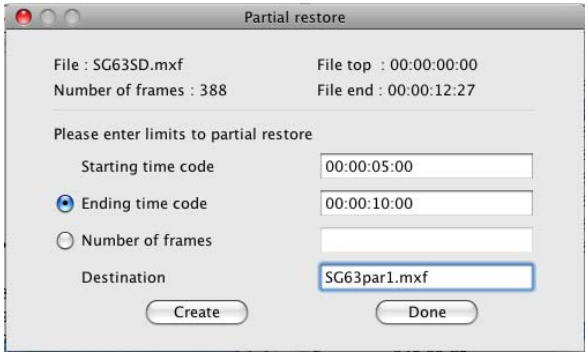
OP1A has both video essence and audio essence embedded into a single file, while OPATOM is composed of a directory containing subdirectories for each of at least one video file and several audio files and possibly other subdirectories such as **Icon**, **Proxy**, **Clip**, etc.

The operational differences between the **Partial restore** operation of OP1A and OPATOM is that the procedure for OP1A defines the destination file and the procedure for OPATOM defines the destination directory.

Partial Restore of MXF OP1A

The **Destination** file name is the name of the virtual file. The edit box for **Destination** is empty by default and you can enter a relative or absolute path.

Figure 39 Partial Restore OP1A Window



When you click **OK** in the **Partial Restore** dialog, the **Partial restore** command creates a corresponding file into the specified folder or if no path is included, into the current folder. This new file is referred to as a *virtual* file as it contains no data but is actually a directory entry which points to the designated sub clip in the original file.

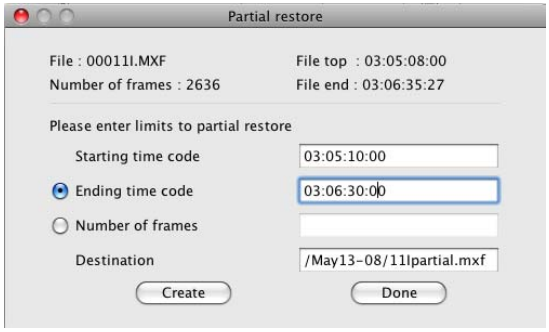
Note: The .mxf extension is a required part of the destination file name, and must be explicitly typed as it will not be added automatically. Add the extension to the file name within the **Destination file name** box.

Note: The partial restore of OP1A is not successful if the destination file name already exists. Confirmation that the Partial Restore was successful indicates that the virtual file was created. The actual partial file will not be created until that virtual file is restored to a destination.

Partial Restore of MXF OPATOM

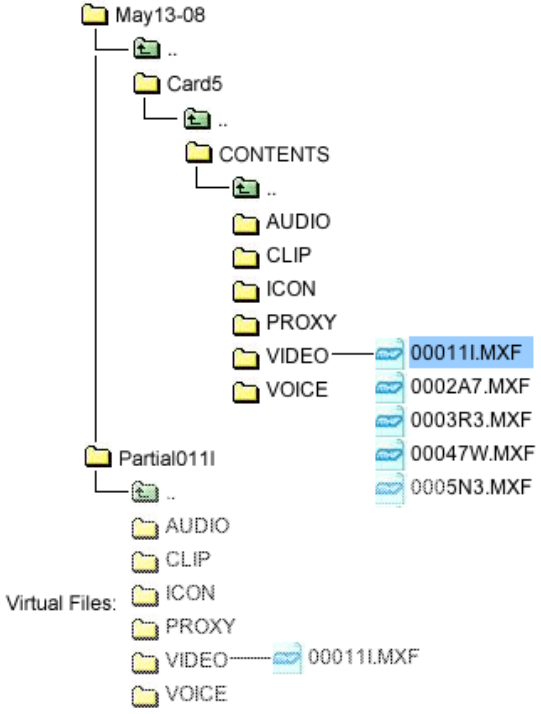
The **Destination file name** is the name of the directory where the virtual files will be stored. There is one virtual file per AV source file. The edit box for **Destination** is empty by default and you should enter an absolute path pointing to the next level up from the current Contents folder level or above (see figure 40).

Figure 40 Partial Restore OPATOM Window



Note that in this case, the **Destination** field defines the directory where the OPATOM subdirectories and files will be created. When you click **OK** in the **Partial restore** dialog, the virtual files are created into the specified directory. The result of creating the example in Figure 40 is shown in the following diagram.

Figure 41 OPATOM Partial



.

Note: The partial restore of OPATOM is not successful if the destination directory already exists.

Once the virtual file is created, a window displays.

Figure 42 Partial Restore Successful Window

When you click **OK**, the Success dialog dismisses and you can continue to define additional subclips with different timecode entries if desired. When you are done creating partial files from the selected clip, click on the **Done** button.

Once the partial restore has been successfully completed, the virtual file(s) are listed in the directory. Since there is only one virtual file for OP1A but several for OPATOM, when OPATOM virtual files are listed in the directory, they appear within subdirectories as shown in figure 41.

Figure 43 Partial File List

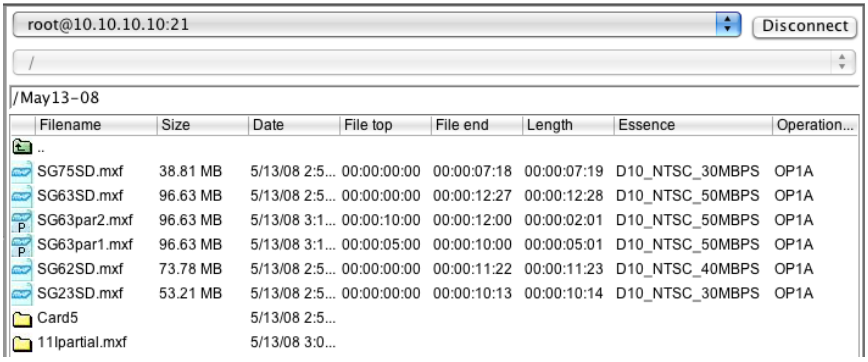


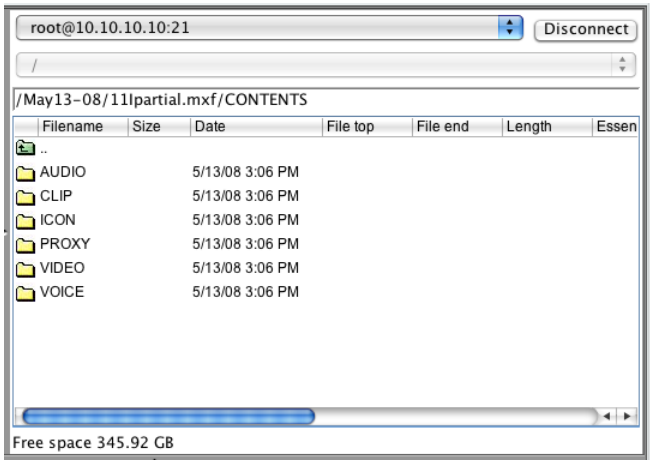
Figure 43 shows the results of the partial file creations from the examples above, including partial OP1A files, identifiable by the "p" shown inside the MXF icon.

In OPATOM, all of the files are organized the same as on a P2 Solid State Media (SSM) Card in a “CONTENTS” directory, which contains the clip metadata subdirectory, video essence subdirectory, audio essence subdirectory, and also may contain a variety of other optional subfolders.

Other directories are not mandatory and are described with the **SITE** command (see the **PARTIAL** command on page 94).

Figure 44 shows the resulting subdirectories created from the OPATOM partial restore operation (i.e., this is what would be seen if you double-clicked the folder identified as 11Ipartial.mxf and then double-clicked the CONTENTS folder in figure 43).

Figure 44 Partial File List in OPATOM



The result of the partial restore command is a virtual file. This file must be retrieved to be completed on the local hard disk.

Retrieve a Virtual File

After a successfully completed partial restore (for both OP1A and OPATOM), you can retrieve the virtual file to the local hard disk with the same type of drag-and-drop operation used for any file.

Note:	The destination of the virtual *must be* to the local hard disk.

Once transferred, a MXF-compliant file is saved to its destination location.

Creating MXF Header Files

From the **Contextual** menu, the **Create Header** selection opens a window (see figure 45) to create an MXF header metadata file. The **Create Header** selection supports an absolute pathname, that is, you can enter a full pathname in the dialog box to set the destination of the file or folder.This action is used to extract any MXF file's header metadata into a separate file. This separate file is user specified to contain binary or XML data as configured (see A-Series options on page 30). Select the MXF file for which metadata is to be extracted and then select the **Create Header** item from the **Contextual** menu. The result of this command is a virtual file. In XML, its size is always 65536 (64 KB).

Figure 45 Create Header Window

This file must be retrieved to be completed. Once the file is transferred, the MXF header file is saved to your local disk.

Note: Since the MXF header in binary format has the same UMID as the original MXF file, storing it may cause problems during a **Partial restore** operation as the file system will find several files previously allocated to the UMID.

Enter the new header name with any extension you want. You can choose the appropriate extension as configured into the **Configuration** tab display (see figure 17 on page 24).

Tape Operations

- From the **Contextual** menu, click **Eject tape**. This will open a window (see figure 46) to eject the loaded tape and disconnect the user.

Note: If the file system table of contents has been modified, these modifications will be saved to tape prior to ejecting.

Figure 46 Eject Tape Window

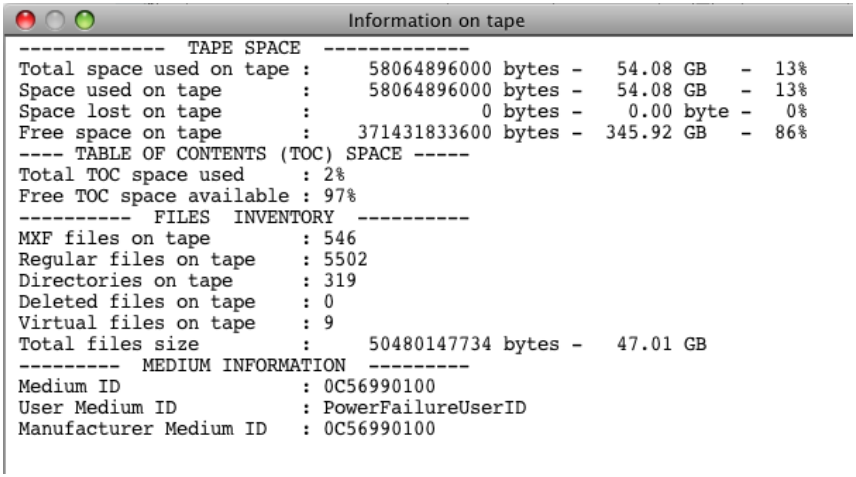
Note: You cannot eject the tape without root privileges (see figure 47).

- From the **Contextual** menu, the **Acknowledge error** command is no longer required and is grayed-out.

Figure 47 Eject Tape Error Window

- From the **Contextual** menu, click **Tape information...**. This will open an information window (figure 48) about the tape identifier and how space is utilized on the tape as follows.
  - **Tape space —** This indicates the total space used on the tape and the total free space available on it (the native capacity after an erase operation is 300 GB).
  - **Table of Contents space —** This indicates the total space used within the allocated area (known as eMAM) for the tape's directory (total number of entries used in the file system) and the total free space available remaining for additional directory entries.
  - **Files inventory —** This indicates the number of entries in the file system for each file type; MXF files, regular files, directories, deleted files, virtual files (virtual files are created by a partial restore command or by a create header command). A virtual file exists only in the file system and is not stored on tape. The number of directories takes into account the two system folders: / and /Trash.
  - **Medium ID** — This is a unique 8-digit ID assigned to the medium.
  - **User Medium ID** — An **eMAM** attribute - up to 160 ASCII bytes for the user to describe the medium.
  - **Manufacturer Medium ID** — A combination of the **Medium ID** and the drive serial number to make a completely unique ID to assign to the medium.

Figure 48 Tape Information



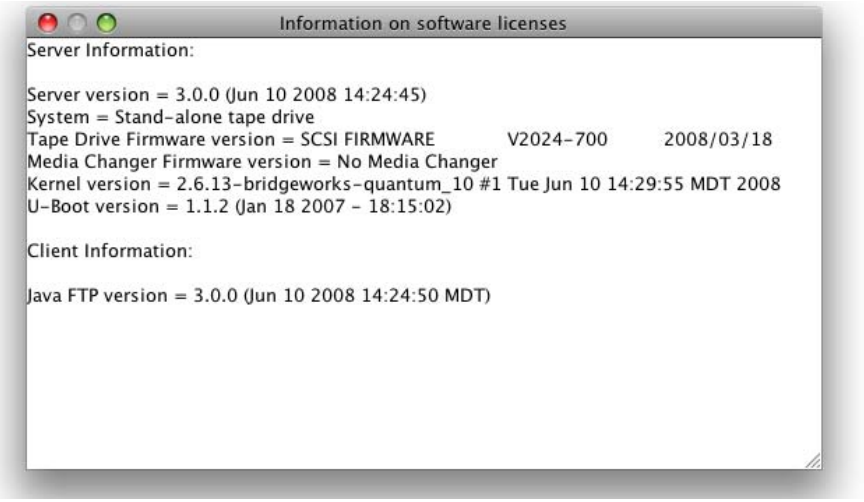
- From the **Contextual** menu, click **Erase tape**. This will open a window (see figure 49) to erase the entire tape after your confirmation.

Caution: All existing data on the file system will be overwritten when you click **Erase tape**.

Figure 49 Erase Tape Window

- From the **Contextual** menu, click **License information...** opens a window about product versions and licenses of the A-Series server and FTP client (see figure 50). The first version number listed is the version of the server firmware.

Figure 50 Information on Software Licenses Window



- From the **Contextual** menu, click **Prepare for magazine unload**. This will disconnect all current FTP connections and move all tapes back to slots within an A-Series autoloader.

  Execute this command to make sure that a desired cartridge does not remain in the tape drive while unloading magazines from the autoloader.

  Note: It is strongly recommended that this command be executed prior to shutting down any SuperLoader 3A Series system.
  This command is disabled for the standalone A-Series tape drive.

File System Limitations

The following lists summarize a number of file system limitations.

File Names and Entries

- The maximum file name length is 97 characters, including the file name extension.
- As of version 3.0, file names or folder names may contain any UTF-8 characters in any combination up to the 97 character limit. This limit is for each individual file or folder item, so a full pathname can be much longer.

> **Note:** While any characters in a file name can be used, many names may not be compatible on platforms other than the one they came from and thus may cause errors upon restore to other computers (see A-Series Best Practices on page 57) for recommendations on file naming.

- The maximum number of entries per Table of Contents on each tape (including both files and folders) depends upon a variety of factors. Rough estimates for the capacity of SDLT 600A systems are 10-12,000 entries and for LTO-3 A-Series systems are 150,000 entries. In general, shorter file names allow for a greater maximum number of files per tape.

A-Series Best Practices

Over the past few years, Quantum has gained experience with the A-Series drives as to a number of practices which can make the user experience smoother. This section gathers some of these items to help our customers have the best possible experience.

Networking Considerations

These drives connect over Gigabit Ethernet (GbE), and that networking technology officially requires CAT6 or better quality cabling. Many users find that older CAT5E or even plain CAT5 wiring works fine over short runs as long as all 8 wires are employed (some older Ethernet cables only have 4 wires connected and these will not work at all). If you are experiencing network issues, cabling quality and length of runs are one of the first places to consider.

In the past, connecting Ethernet devices without a router or switch required a "flipped" cable which swaps transmit and receive pairs. These should never be required on any Gigabit Ethernet devices. This is automatically detected and accommodated by A-Series drives as with all other GbE products.

Gigabit Ethernet is backwards compatible so you can connect an A-Series drive to 100Base or even 10Base networks although your transfer speed will be much slower than even these networks can accommodate since the drive must stop each time it runs out of data and then restart when it gets the next packets.

The **Jumbo Frames** setting is discussed in the configuration sections but is worth mentioning here. It allows transfers of much larger packets and most GbE devices can accommodate them (for instance, all MacPro computers have dual Jumbo Frame enabled GbE ports). Enabling Jumbo Frames provides about a 25% increase in performance in our experience. You will have to experiment in your environment, but it should be worth trying.

When Directory Updates Occur

It is important for users to understand that the directory (also known as the TOC or Table of Contents) is only updated when the user fully disconnects from the drive. Thus, if you wrote something to the tape and then turned off the drive before disconnecting, that information will

never be recorded in the TOC and the archived data has no record of being written and is at that point lost. You will see a power failure message and data loss warning when you reconnect and it may be possible for Quantum to recover that data, but this is clearly a situation to avoid. For this reason we not only recommend that A-Series drives be on an uninterruptible power supply (UPS), and also that users always select the **Disconnect** button whenever an archiving session is completed.

Further, to be completely safe, the tape should always be ejected from the drive when done. This is most easily done from the Contextual menu (right click in the tape directory column) and select **Eject Tape** for stand-alone drives or **Prepare for magazine unload** on SuperLoaders.

File Naming Considerations

FTP Servers and Clients typically do not handle many unusual characters such as quotation marks or slashes, and some can't handle even minor infractions such as extra spaces or periods. A-Series version 3.0 and later firmware has been modified to accept any filenames within our 97 total character limit, regardless of special characters, as we have seen many user problems arising from this.

With this new capability to accommodate any filename in place, there will be still be issues when users attempt to restore such files cross platform. When a Mac file has characters illegal on a Windows machine, and you attempt to restore it to a Windows machine, the transfer will fail because Windows will not let the application create that file name.

In general, it is best practice to limit your filenames to be absolutely safe and adhere to the Windows filename restrictions:

- No control characters (Carriage Return (CR), NULL, and Linefeed (LF) are control characters)
- Don't use < > : " / \ | ? * %
- Don't use space or period as the last character

If you are not adhering to this limited recommended naming practice, the only way to be assured files will restore is to put them back on the same type of machine they came from. Note that, to the best of our knowledge, any Windows files can still always be restored to Macs because Windows naming is much more restrictive.

Third-Party FTP Clients

While A-Series drives employ the IT industry FTP standard, use of the A-Series with other FTP clients may cause problems for a variety of reasons:

- Many FTP clients we have evaluated cannot be set for a long enough timeout to handle latencies experienced with tape drives and especially with SuperLoader operations
- While A-Series drives use standard FTP commands, they also support extended **FTP SITE** commands which are not supported by third-party FTP clients (like eject, erase, etc.)
- Error messages important to understanding any problems which may be encountered are frequently not passed on to the user by third-party FTP clients
- Extended drive capabilities such as viewing MXF properties or doing partial restores can not be accessed by third party FTP clients

For these reasons, we strongly recommend that the A-Series only be accessed by our built-in Web-served FTP client or approved third-party applications (currently including only the Pictron Network Tape Gateway application and Imagine Products HDLog / TEP applications).

One more set of reasons to be cautious of general purpose FTP clients is that most do not support Apple file resource forks as described in the following section.

Users who want to use third-party FTP clients may still be able to do so without problems, especially on Windows platforms. Many customers have reported good results with **Flash FXP** in that environment. Please note that in those situations where you are doing so, Quantum cannot offer technical support.

Apple Resource Forks and the A-Series

Apple computers before Mac OSX used something called "resource forks" to keep track of what application created each file rather than the Windows convention of a three letter dot suffix to keep track of the association (i.e. a **.doc** file is a Microsoft Word file or a **.jpg** is a JPEG image). Resource forks could also keep track of additional information including file types and custom icons. Resource forks are "depreciated" in the Mac OSX, which is to say that they are supported but applications are not supposed to use them anymore. We have found that they are in fact still widely used and important for many applications, including some of Apple's very own applications. We have learned that Final Cut Pro in

particular creates such files and archived projects to not restore correctly unless this resource information is retained.

The A-Series built-in Java FTP Client correctly retains this information in server firmware version 2.5.4 and later. Most other Mac FTP clients such as Transmit and Cyberduck do not do this and should not be used for this reason unless you know you don't need this resource fork information.

Each resource fork file is a hidden file on the Mac OSX and using a cross platform technology which Apple developed and named "AppleDouble," is converted to a "dot underscore" file (for each filename, there will be a matching ._filename). You can view or hide the display of AppleDouble files on tape with the **Listing Option** selector on the FTP Client Show/Hide option popup.

FTP Session Timeouts

Most FTP Clients have some pre-wired amount of time after which they automatically disconnect. As noted above, this may not be long enough for tape operations (shuttling, seeking, updating directories, etc.). In some environments, even the recommended settings for the A-Series clients may not be long enough and can cause disconnects. If you experience error messages that you have been disconnected, you may need to set even longer timeouts than those here:

To set the client timeout:

- Go to the **FTP Client > User Menu > Configuration Tab**
- In the **FTP Client options** box set the **Timeout (sec)** type-in box to 3000 for SuperLoaders or 900 for stand-alone units
- Click **Apply**

To set the server timeout:

- Go to the **Admin Menu** (password: **admin**)
- Select the **Setup** item in the left column
- Set the **FTP Server Timeout (minutes)** type-in box to 60 for SuperLoaders or 15 for Stand-alone units
- Click **Update**
- Select the **Reboot** item in the left column and reboot the drive

Lossless Data Compression

You may well find you can get more than the stated capacity of our tape cartridges (300GB for SDLT 600A or 400GB for LTO-3 A-Series). A-Series drives have hardware lossless data compression running transparently in the background on both the LTO and DLT versions.

Normally video data does not compress further with this and whenever no savings are seen, the data is stored exactly as it comes in to the drives. With other types of data (especially files like documents and spreadsheets) this compression can save up to 2:1. Never worry about this changing your data in any way - every bit stored is guaranteed to restore bit-for-bit as it came in, which is why it is called "lossless."

Always refer to the listing of remaining capacity at the bottom of the A-Series directory listing column for a true representation of how much space you have left, and use the **Tape Information** item of the Contextual menu (right click in the tape directory column) for further details on tape usage and capacity.

Taking the A-Series on the Road

We are seeing an increasing number of customers who are starting to take A-Series drives out into the field to make backups of the increasing range of cameras which record to RAM and hard disk. These users find A-Series tape to be a good replacement for "Field Masters" which used to be automatically generated by hanging on to original tapes.

While there are no ruggedized versions of the drive yet available, those that have been taken out have a fairly good track record. There are three areas to exercise caution: contamination, temperature, and humidity.

Keeping the drive and tapes clean and dust-free is extremely important to ensuring long term operations without problems. Sealed containers and/or using plastic bags to keep contamination out of both the drive itself and tape cartridges is strongly recommended. Keeping a cleaning tape on hand in the event you get a cleaning light warning condition is also an extremely good idea.

The range of temperatures that both the drive and tapes can withstand is very broad, but the range they should be operated in is much more critical as can be seen in the table below. The point here is that whether you are starting with a drive that was baking in the sun or freezing in the cold, try to let it slowly get as close back to room temperature as possible before using.

Description	Storage	Operating
SDLT 600A Drive	-40° to 66° C (-40° to 151° F)	10° to 40° C (50° to 104° F)
SuperDLTtape II	16° to 32°C (60° to 90°F	10° to 40°C (50° to 104°F
LTO-3 A-Series Drive	-40°to 66°C (-40°to 149°F)	10°to 40°C (50°to 104°F)
Ultrium 3 Tape	16°to 32°C 61° to 90°F	10° to 45°C (50° to 113°F)

Finally, all of these systems are rated for 20 to 80% non-condensing humidity or better. Unless you are in a very wet environment, this is not likely to be a problem, but if you start to notice beads of moisture forming on your equipment, it is time to be cautious about making backup tapes. It is advisable to seek out air conditioners, space heaters or even hair driers to try to get the environment to the point where moisture is not collecting on tapes or drives before using.

When All Else Fails

There may be a time when you cannot get your drive to function properly despite all the best practices in the world. When that happens, you will have to contact Quantum technical support. Support may ask you for log files from your drive and that is covered in the appropriate sections of this manual. For convenience it is also included here.

- FTP Server Logs may be collected from the **Admin Menu** side of the A-Series Web page.
- Click **Login** and type **admin** in the **Password** box.
- In order to obtain better information when you send us logs, please check the box for **Enable Syslog Messages** under the **Admin Menu > Setup** page.
- Use the drive until you can reproduce your problem.
- To collect a log, *immediately after* any problem, select the **Admin Menu > Diagnostic Log** page and click the **Generate New Log** button. A link on that page will be created to the log file. Download it and email us the resulting file.

- Also noting the exact error message and number (or snagging a screen shot) and any other descriptions of what the drive did will be helpful.

In some cases you may also be asked for **Client Side** logs.

- FTP Client Logs may be collected by enabling logging under the **Configuration** tab of the **FTP Client** page.
- Turn on the **Use Log File** check box.
- Click the **Change** button and browse to a location on your local hard drive where the log file is to be created (a good place might be your downloads folder or your desktop).
- Client logs will be created as you use the drive and should also be forwarded to Quantum support *immediately after* any problem.

Additional Admin Menu Pages

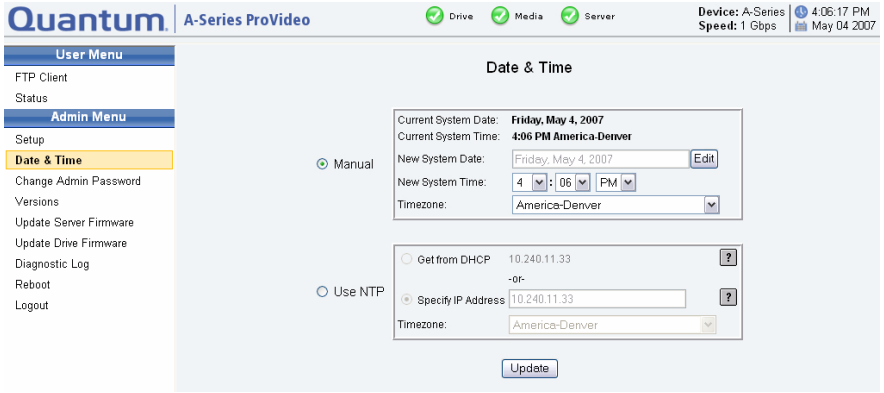
This section provides information about additional administrative features and includes the following **Admin Menu** pages:

- Date & Time
- Change Admin Password
- Versions
- Update Server Firmware
- Update Drive Firmware
- Diagnostic Log
- Reboot

Date & Time

From the **Admin Menu**, you can access the **Date & Time** page (see figure 51) to set the date and time of the A-Series device, either manually or with a Network Time Protocol (NTP) server.

Figure 51 Date & Time



To set the time manually:

1. Select the **Manual** radio button.
2. Select the **New System Date** by clicking the **Edit** button and then choosing the current date from the calendar control.
3. Enter the **New System Time** and then your local **Timezone.**
4. Click the **Update** button.

To set the time using a NTP server:

1. Select the **Use NTP** radio button.
2. Either select **Get from DHCP** or specify the IP address of your NTP server.
3. Select your local **Timezone**.
4. Click the **Update** button.

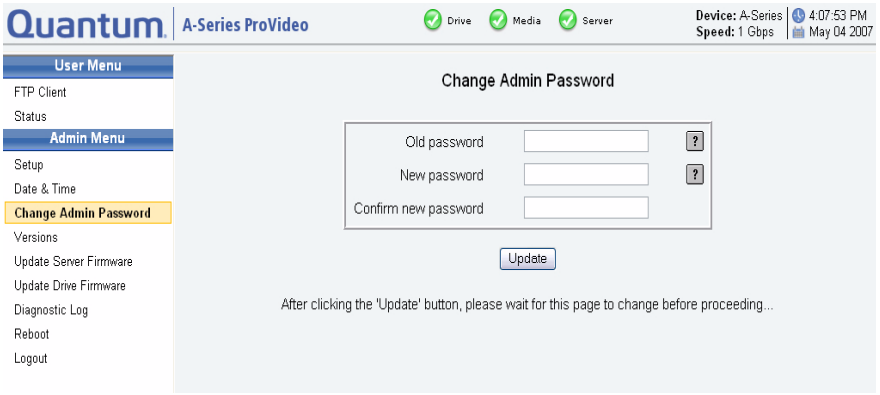
Note:	A reboot of the A-Series server is required for changes to take effect.

Change Admin Password

From the **Admin Menu**, you can access the **Change Admin Password** page (see figure 52) to change the password that accesses the A-Series administrative features.

> **Note:** This is the password to access these **Admin Menu** capabilities and is *not* the password for the FTP client user connection.

Figure 52 Change Admin Password

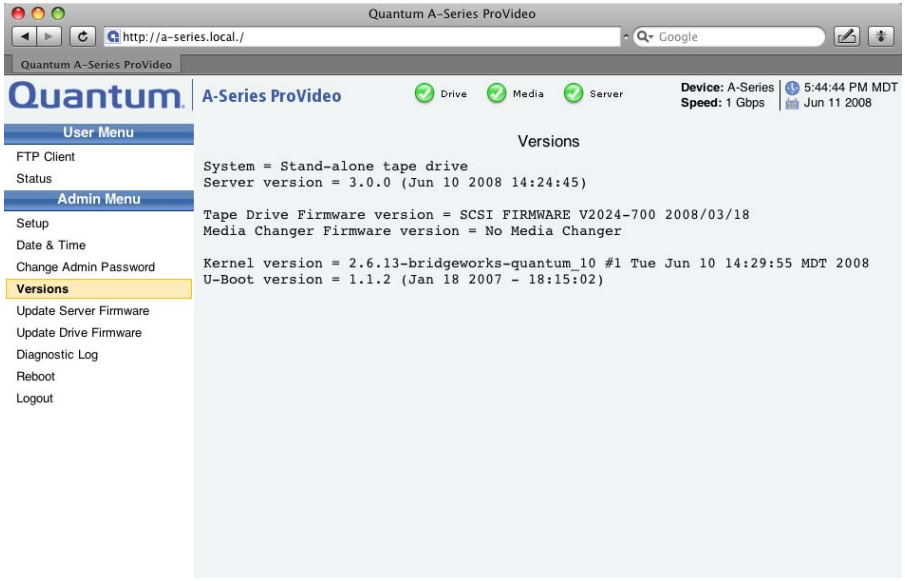


Versions

From the **Admin Menu**, you can access the **Versions** page (see figure 53) to display product versions used in the A-Series FTP server.

You can also access the **Contextual** menu from the **FTP Client** page and click **License information**.

Figure 53 Versions Page



Update Server Firmware

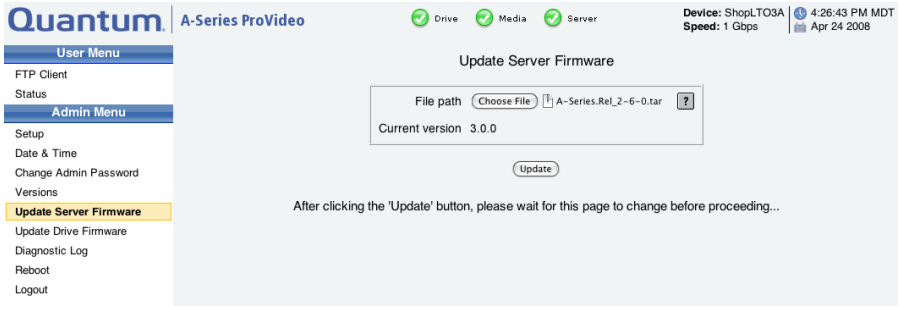
From the **Admin Menu**, you can access the **Update Server Firmware** page (see figure 54) to change the firmware of the built-in FTP server.

To acquire the firmware, go to the software download page at www.quantum.com.

Select **Service and Support** from the navigation bar and select **Product Information**, then navigate to your A-Series model of standalone tape drive or SuperLoader 3A.

Scroll down the page to find the **Server Firmware** download button and save the linked file to any known location on your local drive. This will be a **.tar** file – do not un-tar the file.

Figure 54 Update Server Firmware



Click on the **Browse** button and navigate to where you saved the download and locate the file to update:

A-Series.Rel_x-x-x (e.g. A-Series.Rel_3-0-0.tar)

Click the **Update** button to initate the firmware update. Be patient and wait for the page to refresh before continuing. Select **Reboot** from the left column and confirm when so instructed.

Caution: Interrupting this process can permanently destroy your drive.

Note: Quit and restart your browser after the update process to make sure that the FTP client feature is refreshed properly.

Update Drive Firmware

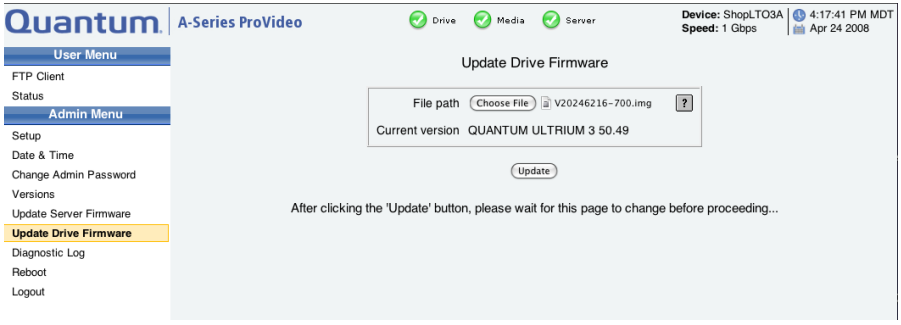
From the **Admin Menu**, you can access the **Update Drive Firmware** page (see figure 55) to change the firmware of the tape drive.

To acquire the firmware, go to the software download page at www.quantum.com.

Select **Service and Support** from the navigation bar and select **Product Information**, then navigate to your A-Series model of standalone tape drive or SuperLoader 3A.

Scroll down the page to find the **Drive firmware** download button and save the linked file to any known location on your local drive. This will be a **.img** file (Mac OS systems will see this as a mountable volume) - do not mount the file.

Figure 55 Update Drive Firmware



Click on the **Browse** button and navigate to where you saved the download and locate the file to update:

filename.img (e.g. V20246216-700.img)

Click on the **Update** button to initiate the firmware update. Be patient and wait for the page to refresh before continuing. Select **Reboot** from the left column and confirm prior to using the drive.

Caution: Interrupting this process can permanently destroy your drive.

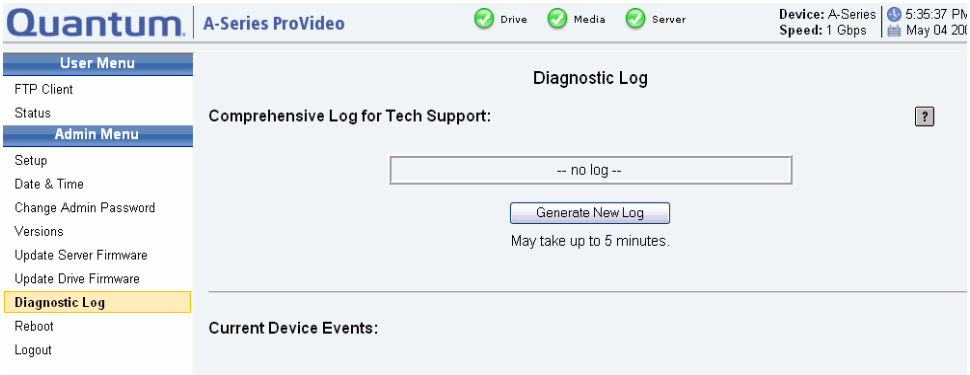
Diagnostic Log

From the **Admin Menu**, you can access the **Diagnostic Log** page to get a comprehensive snapshot of the current state of the A-Series device. Note that the log may not contain enough information for tech support unless the **Enable Syslog Messages** box was checked on the **Setup** page when an error occurred.

> **Note:** The Diagnostic Log is cleared after any reboot or power cycle and is limited in size, containing only the latest operations. For this reason Diagnostic Logs should be collected *immediately after* any problem arises.

To generate a Diagnostic Log, click **Diagnostic Log** from the **Admin Menu**, then click **Generate New Log** (see figure 56).

Figure 56 Diagnostic Log



It can take several minutes to generate the diagnostic log as shown in figure 57.

When log generation completes, the new diagnostic log file displays (see figure 58).

You must now download the log file to your local computer by right-clicking on the link which appears, selecting **Download Linked file**, and saving the **.gz** file to any known location on your local disk. Email the resulting file to Quantum Customer Support, also noting the exact error message and number (or snagging a screen shot) and any other descriptions of what the drive did. This information will be helpful in diagnosing your problem.

Figure 57 Diagnostic Log Generating

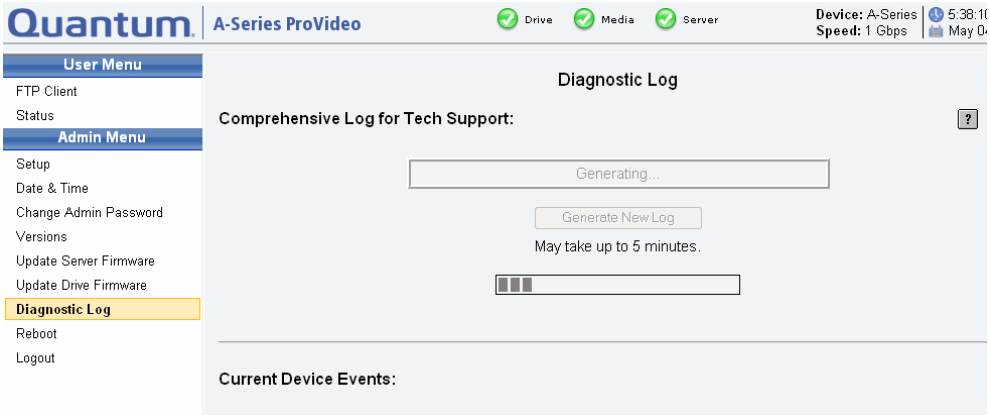
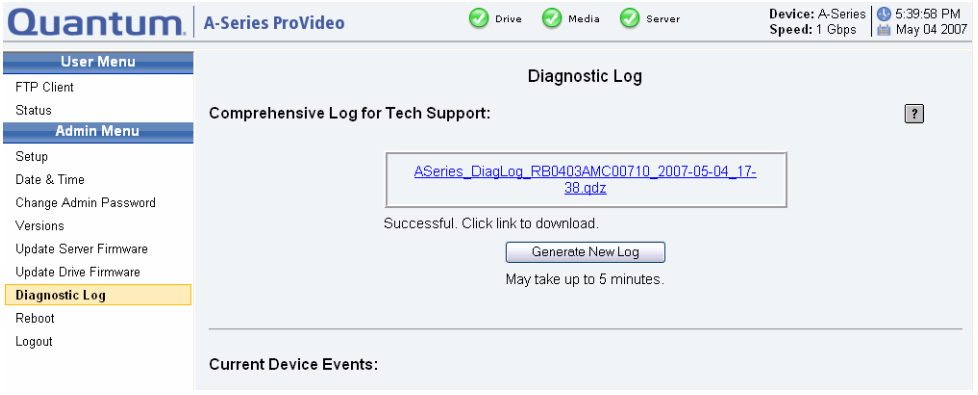


Figure 58 Diagnostic Log Complete



Reboot

From the **Admin Menu**, you can access the **Reboot** command for a system restart.

> **Note:** Always remove the tape before turning off the A-Series tape drive. Failure to remove a tape prior to the **Reboot** command can cause loss of data on tape.
>
> A tape cartridge can be unloaded during an active FTP session only by using the built-in FTP client. Right-click within the right pane of the FTP client window to display the **Contextual** menu, then click **Eject tape**.
>
> A tape cartridge can be unloaded from the front panel of the drive only when the FTP client is not connected.

To reboot:

1. Click **Reboot** on the **Admin Menu**. A **Reboot** confirmation window displays.

Figure 59 Reboot Confirmation Window

2. Click **OK**.

Figure 60 Reboot in Progress

Appendix A

Troubleshooting

This appendix provides troubleshooting information that might be helpful with problems encountered when working with FTP file transfers using the built-in FTP client and server.

This appendix covers the following topics:

- Resetting System Defaults provides a procedure to reset the A-Series tape drive to its default values.
- FTP File Transfer Troubleshooting provides troubleshooting information.

Resetting System Defaults

As there is no access to the A-Series tape drive other than the Ethernet port, a mechanism has been implemented to reset the settings to their default values. This is useful if an end user loses the IP address of the A-Series tape drive.

The system defaults are as follows:

Name	Password/Setting
Static IP address	10.10.10.10
Netmask	255.255.255.0
Admin Menu default password	admin
FTP Client login	root
FTP Client default password	password

SDLT 600A Drive Reset

To reset an SDLT 600A tape drive back to default values:

1. Disconnect the network cable from the drive.
2. Switch off your tape drive.
3. Insert a write protected cartridge into the drive.
4. Switch on the tape drive (after approximately one minute, the cartridge will be ejected).
5. Repeat steps 2 – 4 above two more times.
6. After the third cycle, switch off your tape drive.
7. Reconnect your network cable and switch on the tape drive.
8. Set your cartridge write protection on or off (as you need it) and reinsert the tape (or another tape).
9. Access the drive from a browser at the default IP address (10.10.10.10) to reconfigure to your desired settings.

LTO-3 A-Series Drive Reset

To reset an LTO-3 A-Series tape drive back to default values:

1. Disconnect the network cable from the drive.
2. Insert a write protected cartridge into the drive (wait approximately 30 seconds for tape to load and lights to stop flashing).
3. Switch off your tape drive for 10 seconds.
4. Switch on the tape drive (after approximately three minutes, the cartridge will be ejected and reloaded; after an additional 30 seconds lights will stop flashing).
5. Repeat steps 3 and 4 above two more times.
6. After the third cycle, press the eject button on the drive to eject the tape and switch off the drive.
7. Reconnect your network cable and switch on the tape drive.
8. Set your cartridge write protection on or off (as you need it) and reinsert the tape (or another tape).
9. Access the drive from a browser at the default IP address (10.10.10.10) to reconfigure to your desired settings.

FTP File Transfer Troubleshooting

This section provides troubleshooting information that might be helpful with problems encountered when working with FTP file transfers using the built-in FTP client and server.

Root User

When three root users are already connected, and you try to connect as a root, you will have an FTP error window (see figure 21 on page 29).

Given the time out setting of the built-in FTP client, it may need some time before the root connection becomes available.

Connecting as a guest user, it is possible to kill a root connection using a site command:

SITE KILLROOT <SP> <root password> <CRLF>

This command allows a guest user to disconnect the root user.

Caution: Before attempting such an operation, we encourage you to report your intention to the root user.

In Case of a Power Failure

A power failure will also cause also all users to be disconnected.

On any new connection after a power failure, the following window displays:

Figure 61 Power Failure Error Message

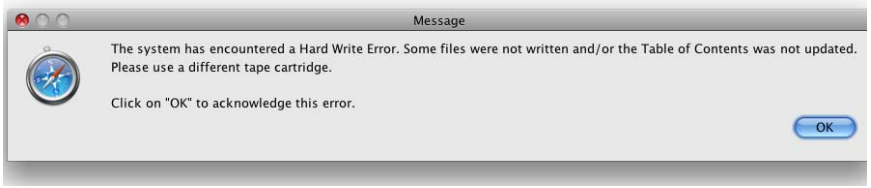
Click OK to acknowledge the power failure and allow further operations.

Note: Examine your tape's files carefully and re-archive any content that was lost.

In Case of a Write Error

Any write error causes all users to be disconnected. On any new connection after a write error, the following window displays (see Figure 62):

Figure 62 Write Error Window



Write Protect Cartridge

When the table of contents of the file system is modified before the cartridge is protected (protection is made when the cartridge is inside the drive) these modifications will not be saved in the eMAM when a user ejects the tape or disconnects its FTP client.

MXF Troubleshooting

Two MXF Files with Same UMID

It is possible that two MXF files have the same UMID when the MXF header metadata file is reingested into the A-Series tape drive. On a partial restore operation, the FTP server searches for the file according to the UMID. This way it can find the good file and bad file if there are two (the header metadata file).

Cannot Display MXF Properties

When storing MXF files, MXF metadata are extracted. MXF files are converted to regular files if MXF metadata cannot be retrieved (but are not renamed).

This solves issues such as the following:

- Creating a partial file without MXF metadata
- Restarting the transfer of an MXF file after an abort
- Listing MXF information (SITE MXFNFO) from aborted MXF files

MXF Interoperability with Avid Files

Storing Avid native files may cause an error message (**bad mxf file format**) if not compliant to the MXF standard.

Network Drive Limitation

When the A-Series FTP server is mapped as a network drive using ftp://root@Ip, Windows XP/2000 opens two connections. However, it closes only one connection when the File Explorer window is closed. After three connections, there are three root users (maximum allowed) pending on the FTP server side. To avoid this issue, the network drive must be mapped using ftp://root:password@Ip. The drawback is that the password can be read from the network drive properties.

Summary Tab

Upon completion of each file transfer queue, the lower portion of the FTP client automatically switches to the Summary tab where, if any errors were encountered, a complete list with explanations is displayed. Examine this report carefully for full information about any files that failed to transfer correctly and take corrective action as needed.

Built-in FTP Client Troubleshooting

Java Run-time Environment (JRE)

The JRE may be installed under the operating system without support for oriental or occidental scripts. That is, certain coding schemes do not display in the built-in FTP client combo box. To add them with Windows XP, you must select the JRE used by the system. Click **Start, Settings, Add or Remove Programs, JRE, Modify**. Follow the wizard to download appropriate files for oriental languages.

In certain ISP connected network configurations, JRE 1.50 can cause an additional 30 second delay per file transferred which can greatly slow down operations with many files. If these long delays before each file transferred is seen, change your JRE back to 1.42 to resolve the issue.

Browser Issues

It is important to quit your browser and restart it after updating firmware versions. Failure to do so can cause you to be running an old Java applet with incompatible new software.

In some cases cached pages can cause further problems. In Windows environments, before loading a new FTP server image (the Java FTP client is built in) you should clean your Internet Explorer environment. This avoids any side effects, such as Internet Explorer loading a previous version of the built-in FTP client.

From Internet Explorer, go to your **Tools/Internet Options** and clear the following:

- Cookies
- Temporary files
- History

Close all Internet Explorer sessions.

From Safari, click on the left most **Safari** menu and select **Empty Cache**. If problems persist, you may need to select **Reset Safari...** and check:

- Empty the Cache
- Clear Downloads Window
- Remove all Cookies

FTP Error Window

On occasion, a FTP error window requiring acknowledgement may be hidden behind a main window. As a result, all operations are disabled until the error is acknowledged. Use **<Alt+Tab>** (**<Cntl+~>** on Mac OS) to bring the error window to the front.

Drag and Drop

Drag and drop does not work as it does in Microsoft Windows. You must first select the item before doing this operation.

Communication Problem with Windows Server 2000

There is an incompatibility issue only with the **RETR** operation (not with **STOR**). As soon as the FTP server responds with **150**, an error may rise locally on the client system indicating a communication buffer problem.

A work around for the built-in FTP client is to change the buffer size in the configuration menu.

FTP Server Troubleshooting

Encoding Modification Not Taken Into Account

After any encoding modification, (selecting a different encoding on the **FTP Client Configuration** page), the user should quit and restart the browser to assure the new encoding selection is in effect.

Encoding Modification Side Effects

Before changing the FTP server encoding, it is safer to erase the tape to avoid any side effects. For example, files transferred with filenames set to a specific character set may not be listed into another encoding character set and may not be available for FTP operations.

Anonymous Connection Not Supported

The A-Series FTP server does not support anonymous connection. Any attempt to connect with anonymous connection causes the following error message:

Unable to connect to remote server and unable to setup a secure anonymous FTP

Remember, only root (password is **password**) and guest (password is **guest**) connections are supported.

When the login is set to anonymous at the first try to connect to the built-in Java client, then the following tries will keep the same login anonymous. If you do not enter a login and password, the Java FTP client always tries to connect as anonymous.

To work around this problem, type OK to exit the error message window and go to the Configuration page. Select the connection that has been automatically named as @x.x.x.x:21 (where x.x.x.x is the IP address) and set the login and password correctly. Then select **Apply**.

Text Data Transfer Mode Not Allowed

Because the A-Series FTP server does not support ASCII data transfer, a user has to set the mode for the put (upload) and get (download) operations of text files into its FTP client (if not the Java FTP client). Set the mode from **AUTOMATIC** to **BINARY**, exit the FTP client, and reload it.

Frequent FTP Client Timeouts

An FTP client timeout occurs when the FTP server does not answer an FTP command within the allocated time.

If the FTP client timeout setting is too low, an error may occur during extended tape seek operations. In this case it is necessary to increase the timeout value of the FTP client and/or server in the client Configuration page and the server Admin Menu > Setup page.

> **Note:** FTP Timeout conditions can be indicated by a variety of error messages. **Unexpected Null Reply** and **Broken Pipe** indicate the FTP session ended unexpectedly and are frequently due to a timeout.

Multiple Drive Environments

In multiple drive environments users may encounter a red X instead of the FTP Client applet. Once a computer has connected to one drive on a network, that drive will serve the applet and allow connections to all other drives on the network. In order to connect to a different drive to serve the applet, that browser must be quit and restarted.

Appendix B

FTP Commands

To take full advantage of the capabilities of the A-Series tape drives, you must have an FTP client that allows you to send SITE commands.

Supported FTP Commands

The following FTP commands are supported by the A-Series tape drives:

- Standard Commands (RFC959): **ABOR, CDUP, CWD, DELE, HELP, LIST, MKD, MODE, NLST, NOOP, PASS, PASV, PORT, PWD, QUIT, REST, RETR, RMD, RNFR, RNTO, SITE, STOR, STRU, SYST, TYPE, and USER**
- RFC775 Commands: **XCUP, XCWD, XMKD, XPWD, and XRMD**
- SITE Commands: **ACKNOWLEDGE_ERROR, DELE, DIRSIZE, DRIVE_SN, EJECT, ERASE, ESSTYP, FREE, FSIZ, FTYP, GETMEDIUMID, HDR2XML, HEADER, HELP, IDLE, MEID, MXFNFO, PARTIAL, RELEASEMEDIA, SERVER_SN, SETMEDIUMID, TC, TIME, and VERSION**
- Commands Not Normalized (Internet Draft): **FEAT and SIZE**

Standard Commands (RFC959)

The following RFC959 standard commands are supported:

Command	**ABOR**
Syntax	abor <CRLF>
Parameters	N/A
Purpose	aborts a file transfer (STOR or RETR).
Command	**CDUP**
Syntax	cdup <CRLF>
Parameters	N/A
Purpose	equivalent to "cwd .."
Command	**CWD**
Syntax	cwd <SP> <pathname> <CRLF>
Parameters	- <pathname>: an existing relative or absolute directory.
Purpose	This command allows the user to work with a different directory.
Command	**DELE (*)**
Syntax	dele <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command allows the user to send a file to the Trash. RMD must be used instead of DELE to delete a directory.
Command	**HELP**
Syntax	help [<SP> <command>] <CRLF>
Parameters	<command>: a FTP command.
Purpose	Without parameters, this command lists in alphabetic order the standard commands. When <command> is a valid standard command, HELP provides the syntax of <command>.
Command	**LIST**
Syntax	list [<SP> <options>] [<SP> <pathname>] <CRLF>

Parameters	• <options>: same format as ls UNIX command. '-a' and '-l' are currently supported. If no options, it is equivalent to a "ls -l" UNIX command. • <pathname>: the directory or the filename that will be listed. A null argument implies the current working directory.
Purpose	This command lists directory or file contents the same way the UNIX command 'ls -l' does. Contents will be sent to the passive DTP. The client must have previously set TYPE to ASCII.
Command	**MKD (*)**
Syntax	mkd <SP> <pathname> <CRLF>
Parameters	<pathname>: a relative or absolute pathname.
Purpose	This command causes the directory specified in the pathname to be created as a directory.
Command	**MODE**
Syntax	mode <SP> <mode-code> <CRLF>
Parameters	<mode-code>::= S | B | C. Transfer mode. Only 'S' (Stream) is supported.
Purpose	This command allows the client to change the transfer mode. The only available transfer mode is Stream ('S').
Command	**NLST**
Syntax	nlst [<SP> <options>] [<SP> <pathname>] <CRLF>
Parameters	• <options>: same format as ls UNIX command. '-a' and '-l' are currently supported. If no options, it is equivalent to a "ls" UNIX command. • <pathname>: the directory or the filename that will be listed. A null argument implies the current working directory.
Purpose	This command lists directory or file contents the same way the UNIX command "ls" does. Contents will be sent to the passive DTP. The client must have previously set TYPE to ASCII.
Command	**NOOP**
Syntax	noop <CRLF>
Parameters	N/A
Purpose	This command does not affect any parameters or previously entered commands. It specifies no action other than that the server send an OK reply.

Command	**PASS**
Syntax	pass <SP> <string> <CRLF>
Parameters	<string>: the user's password.
Purpose	This command must be immediately preceded by the USER command. Any attempt to use this command when connected will be refused.
Command	**PASV**
Syntax	pasv <CRLF>
Parameters	N/A
Purpose	This command requests the server-DTP to "listen" on a data port (which is not its default data port) and to wait for a connection rather than initiate one upon receipt of a transfer command. The response to this command includes the host and port address this server is listening on.
Command	**PORT**
Syntax	port <SP> <host-port> <CRLF>
Parameters	- <host-port>: the concatenation of a 32-bit IP address and a 16-bit TCP port address. <host-port> ::= <host-number>,<port-number> <host-number> ::= <number>,<number>,<number>,<number> <port-number> ::= <number>,<number> <number> ::= any decimal integer 1 through 255
Purpose	This command changes the default data port value.
Command	**PWD**
Syntax	pwd <CRLF>
Parameters	N/A
Purpose	This command causes the name of the current working directory to be returned in the reply.
Command	**QUIT**
Syntax	quit <CRLF>
Parameters	N/A

Purpose	This command closes the control connection opened with the sequence USER+PASS, if a file transfer is not in progress. If file transfer is in progress, the client should send an ABOR command before a QUIT.
Command	**REST**
Syntax	rest <SP> <marker> <CRLF>
Parameters	<marker>: offset in the file (in bytes) at which the transfer will be restarted.
Purpose	This command is useful to restart an interrupted transfer. It gives to the server the byte position in the file at which the transfer will restart. It must be immediately followed by a STOR or RETR command which shall cause file transfer to resume.
Command	**RETR (*)**
Syntax	retr <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command causes the server-DTP to transfer a copy of the file, specified in the pathname, to the server DTP at the other end of the data connection.
Command	**RMD (*)**
Syntax	rmd <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute directory.
Purpose	This command allows the user to remove a directory from the file system. It cannot be used in the following cases: • remove Trash or Root • remove a file • remove a directory which contains data.
Command	**RNFR**
Syntax	rnfr <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command specifies the old pathname of the file which is to be renamed. This command must be immediately followed by a RNTO command specifying the new file pathname.
Command	**RNTO (*)**

Syntax	rnto <SP> <pathname> <CRLF>
Parameters	<pathname>: a relative or absolute directory that does not exist yet.
Purpose	This command specifies the new pathname of the file specified in the immediately preceding RNFR command. Together the two commands cause a file to be renamed. Can be used to move a file.
Command	**SITE**
Syntax	site <SP> <command> : an existing SITE command.
Parameters	<some optional arguments...>: cf. each SITE command for details.
Purpose	This command is used to implement custom FTP commands.
Command	**STOR (*)**
Syntax	stor <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command causes the server-DTP to accept the data transferred via the data connection and to store the data as a file at the server site. If the file specified in the pathname exists at the server site, then its contents shall be replaced by the data being transferred. A new file is created at the server site if the file specified in the pathname does not already exist.
Command	**STRU**
Syntax	stru <SP> <structure-code> <CRLF>
Parameters	<structure-code>: file structure. Only 'F' (File) is supported.
Purpose	This command allows the client to change the file structure. The only available transfer mode is 'File' ('F').
Command	**SYST**
Syntax	syst <CRLF>
Parameters	N/A
Purpose	This command is used to find out the type of operating system at the server. Its successful answer is "UNIX Type : L8".
Command	**TYPE**
Syntax	type <SP> <type-code> <CRLF>

Parameters	- <type-code> ::= A [<sp> <form-code>] | E [<sp> <form-code>] | I | L <sp> <byte-size> <form-code> ::= N | T | C
Purpose	changes data Representation and Storage type. Supported types: 'A'(ASCII), and 'I' or 'L 8' (8-bit binary).
Command	**USER**
Syntax	user <SP> <string> <CRLF>
Parameters	<string> : user name.
Purpose	This command allows the client to be identified by the server. It will be the first command transmitted by the user after the control connections are made. It must be immediately followed by the PASS command. The command sequence USER+PASS is necessary to access to the server file system. Any attempt to use this command when connected will be refused.
Note:	(*) = Commands requiring the ROOT privilege.

RFC775 Commands

The following RFC775 commands are supported:

Command	**XCUP**
Syntax	
Parameters	
Purpose	see CDUP
Command	**XCWD**
Syntax	
Parameters	
Purpose	see CWD
Command	**XMKD (*)**
Syntax	
Parameters	
Purpose	see MKD
Command	**XPWD**
Syntax	
Parameters	
Purpose	see PWD
Command	**XRMD (*)**
Syntax	
Parameters	
Purpose	see RMD

Note: (*) = Commands requiring the ROOT privilege.

SITE Commands

The following SITE commands are supported:

Command	**ACKNOWLEDGE_ERROR (*)**
Syntax	site acknowledge_error <CRLF>
Parameters	N/A
Purpose	This command acknowledges an error which may have caused data loss, such as a write error or power failure.
Command	**DELE (*)**
Syntax	site dele <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command definitively erases a file or a directory in the file system. The targets that cannot be deleted are: • a directory which contains data • Trash • Root
Command	**DIRSIZE**
Syntax	site dirsize <SP> <directorypath> <CRLF>
Parameters	<directorypath>: an existing relative or absolute directory
Purpose	This command displays the size of the specified directory.
Command	**DRIVE_SN**
Syntax	site drive_sn <CRLF>
Parameters	N/A
Purpose	This command displays the tape drive serial number.
Command	**EJECT (*)**
Syntax	site eject <CRLF>
Parameters	N/A

Purpose	This command ejects the cartridge then disconnects all users (it is only valid for a stand-alone tape drive and not valid for an autoloader).
Command	**ERASE (*)**
Syntax	site erase <CRLF>
Parameters	N/A
Purpose	This command erases the EMAM. It also creates two directories on the tape: a root and a Trash.
Command	**ESSTYP**
Syntax	site esstyp <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the user-PI the type of the essence(s) contained in the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**FREE**
Syntax	site free <CRLF>
Parameters	N/A.
Purpose	This command returns some useful information about Tape Space, eMAM space, and a file inventory.
Command	**FSIZ**
Syntax	site fsiz <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the user-PI the number of frames contained in the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**FTYP**
Syntax	site ftyp <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.

Purpose	This command sends to the user-PI the operational pattern of the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**GETMEDIUMID**
Syntax	site getmediumid <SP> <type> <CRLF>
Parameters	<type>: a string that can be equal to “manufacturer” or “user” (not case sensitive)
Purpose	This command returns the manufacturer or user medium ID.
Command	**HDR2XML (*)**
Syntax	site hdr2xml <SP> <switch> <CRLF>
Parameters	<switch> : a string that can be equal to ‘on’ or ‘off’ (case insensitive).
Purpose	Enable (switch=’on’) or disable (switch=’off’) XML mode for MXF header files. Side effects in XML mode: - RETR: the header files are generated in XML before being sent to the client.
Command	**HEADER (*)**
Syntax	site header ["]<in-filename>["] <SP> ["]<out-filename>["] <CRLF>
Parameters	• <in-filename>: a relative or absolute pathname of a MXF file. The user must use <”source name”> if there is space in that name. • <out-filename>: the desired relative or absolute header path name. It must be located in an existing folder. The user must use <”source name”> if there is space in that name.
Purpose	This command extracts the header of a MXF file and creates a corresponding entry in the file system.
Command	**HELP**
Syntax	site help [<SP> <command>] <CRLF>
Parameters	<command>: a FTP SITE command.
Purpose	Without parameters, this command lists in alphabetic order the implemented SITE commands. When <command> is a valid SITE command, HELP provides the syntax of <command>.
Command	**IDLE**

Syntax	site idle <SP> <time> <CRLF>
Parameters	<time>: timeout value in seconds. <time> may also be equal to the string “DEFAULT” (case insensitive). In this case the timeout is reset to its default value.
Purpose	This command changes the default value of the idle time. If the server does not detect any activity of a client for <time> seconds, it disconnects it.
Command	**MEID**
Syntax	site meid [<SP> <pathname>]<CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the FTP client the UMID of the MXF file specified in the pathname. If <pathname> is a directory, the command will do it for all the MXF files contained in the directory.
Command	**MXFNFO**
Syntax	site mxfnfo <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the user-PI a list of information relative of the MXF file specified in the pathname: • operational pattern (FTYP) • number of frames (FSIZ) • UMID (MEID) • essence(s) type (ESSTYP) • timecodes (TC) If <pathname> is a directory, the command will do it for all the MXF files contained in the directory. It will also add the name of the file at the beginning of the list.

Command	PARTIAL (*)
Syntax	site partial <SP> <tcin> <SP> <tcout or number of frames> <SP> ["]<in-filename>["] <SP> ["]<out-filename>["] <CRLF>
Parameters	• <Tcin>: time code XX:XX:XX:XX • <Tcout>: time code XX:XX:XX:XX or a number of frame 0 to 2147483647. • <in-filename>: a file name in the current folder or a path/filename. The user must use <"source name"> if there is space in that name. • <out-filename>: a file name in the current folder or a path/filename. Except in case of OPATOM file, in this case the output must be an existing folder. The user must use <"output name"> if there is space in that name.
Purpose	Create partial MXF file(s). Expected results: • Source is one OP1A file: A file named <output name> is created in the current folder or in the target folder if specified in <output name>. • Source is one file of a complete OPATOM P2 set of files: A folder named CONTENTS/ is created in the folder <output name>. This folder will be composed of six subfolders: • AUDIO/ that contains MXF audio files. • VIDEO/ that contains MXF video file. • CLIP/ that contains the XML file. • ICON, VOICE, PROXY / these folders are non-mandatory and are necessary to import third-party applications. No operation is provided by the A-Series on the original content of these folders. The target files will have the same names than there corresponding sources. • Source is one file of an OPATOM set of files: A folder named <output name> is created that contain targeted files, all with the same names than there corresponding sources.
Command	**RELEASEMEDIA (*)**
Syntax	site releasemedia <CRLF>
Parameters	N/A

Purpose	This command saves all file systems (eMAM is written to tape) that are not yet up to date. It also disconnects all users and allows for media removal (it is only applicable to an autoloader and is not valid for a standalone tape drive).
Command	**SERVER_SN**
Syntax	site server_sn <CRLF>
Parameters	N/A
Purpose	This command displays the server serial number.
Command	**SETMEDIUMID (*)**
Syntax	site setmediumid <SP> <type> <CRLF>
Parameters	<type>: a string that can be equal to “user” (not case sensitive)
Purpose	This command sets the user medium ID.
Command	**TC**
Syntax	site tc <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the user-PI the Timecodes of the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**TIME**
Syntax	site time <CRLF>
Parameters	N/A.
Purpose	This command sends to the FTP client the current date and time of the system.
Command	**VERSION**
Syntax	site version <CRLF>
Parameters	N/A.

Purpose	This command sends to the FTP client the following list of versions: • Server version and build date • System type (stand-alone tape drive or autoloader) • Tape drive firmware version • Media changer firmware version • Kernel version and build date • U-boot version

Note: (*) = Commands requiring the ROOT privilege.

Commands Not Normalized (Internet Draft)

Command	FEAT
Syntax	feat <CRLF>
Parameters	N/A.
Purpose	This command lists all the supported extended commands. The server currently supports only the SIZE extended command (from the draft "draft-ietf-ftpext-mlst-16.txt").
Command	**SIZE**
Syntax	size <SP> <pathname> <CRLF>
Parameters	N/A.
Purpose	This command is used to obtain the transfer size of a file from the server-FTP process. This size is the exact number of bytes that would be sent over the data connection if that file were transmitted in BINARY mode. A SIZE command on a directory will fail.

Glossary

A

access Read, write, or update information on a storage medium, such as tape.

access time The interval between the time a request for data is made by the system and the time the data is available from the drive.

API Application Programming Interface.

applet Java applets are small Java programs that get downloaded to the client computer and then run from a web browser when a web page that uses Java is loaded.

archiving The removal of data from the computer system on to secondary storage media that is safely stored away.

autoloader A robot that includes one tape drive and one or more magazines of tape cartridges. Autoloaders are used for unattended data backup.

A/V A/V or Audio/Video is a generic term used to describe products and services associated with audio and video.

B

backup A copy of a file, directory, or volume on a separate storage device from the original, for the purpose of retrieval in case the original is accidentally erased, damaged, or destroyed.

backward compatibility The ability of a current drive product to read tapes written on earlier model drives.

bad data block A block that cannot reliably hold data because of a media flaw or damaged format markings.

BIOS Basic Input/Output System. A set of routines that work closely with the hardware to support the transfer of information between various elements of the system, such as memory, disks, and peripheral devices.

BOM or BOT Beginning of Media or Beginning of Tape. The physical beginning of the media.

Bonjour Bonjour is Apple Inc.'s trade name for its implementation of Zeroconf, an automatic means to locate devices on local area networks such as printers, as well as other computers, and the services that those devices offer. Bonjour comes installed on Apple's Mac OS X operating system from version 10.2 onwards, and on Microsoft Windows operating systems when installed.

BSMI Bureau of Standards, Metrology, and Inspection (Taiwan).

buckling mechanism The buckling mechanism engages the media leaders on cartridge load and disengages them on cartridge unload.

buffer An area of RAM reserved for temporary storage of data that is waiting to be sent to a device. The data is usually on its way to or from the tape drive or some other peripheral device.

C

cache Specialized RAM used as a buffer between a fast CPU or I/O channel and storage which has a relatively slow access time (for example, cartridge or diskette), to avoid slowing down the former.

CE Council of Europe.

CFR Code of Federal Regulations (United States).

CSA Canadian Standards Association, also known as CSA International.

compressed capacity Capacity after data has been processed to reduce storage space while maintaining data integrity using either software or hardware.

D

data compression A process that reduces the amount of storage space required to hold a particular block of data. Data transfer speed and total tape capacity are affected by the data compression achieved. In accordance with industry practice, a typical

compression ratio is 2:1 of data storage. Actual compression ratios achieved are dependent on the redundancy of data files being recorded.

dB A Decibel is a logarithmic unit of sound intensity; 10 times the logarithm of the ratio of the sound intensity to some reference intensity.

DCM The Data Control Module provides the path and guides for all media motion inside the tape drive and to write data to and read data from the media.

device driver A low-level (usually kernel-mode) operating system component that enables a PC to communicate with peripheral devices such as printers, CD-ROMs, and tape drives. Each kind of device requires a different driver.

DHCP Dynamic Host Configuration Protocol. A protocol used by networked devices (clients) to automatically obtain a unique IP address, allowing devices to be added to the network with minimal or no manual configurations.

DLT Digital Linear Tape.

DLT*Ice* Quantum's firmware compliance management function of DLTSage, which provides secure archival functionality to the SDLT 600A tape drive and DLTtape II cartridges.

DLTSage Quantum's suite of preventive maintenance diagnostic software tools that enables users to more simply manage tape storage environments.

domain A group of computers, programs, and devices on a network administered as a unit with common procedures and rules for use by a specific group of users. A user logs on to the domain to gain access to the resources.

E

ECC Error Correction Code, also known as Error Checking and Correction. The incorporation of extra parity bits in transmitted data in order to detect errors that can be corrected by the controller.

EDC Error Detection Code. DLT tape drives include a 16-bit EDC with every 4 KB of user data. The EDC helps the drive detect and recover any errors that may occur.

EEC European Economic Community.

EEPROM Electronically-Erasable Programmable Read Only Memory. An integrated circuit memory chip that can store programs and data in a non-volatile state. These devices, which are used to store firmware in DLT tape drives, can be erased and reprogrammed with new data.

EIM The Electronic Interface Module provides the main control function for the system and the interface from the system to the host computer, library, or autoloader.

EMAM Enhanced Media Auxiliary Memory - The memory on a cartridge associated with the file system table of contents.

EMC Electromagnetic Compatibility.

EMI Electromagnetic Interference. Electrical interference caused by electromagnetic radiation.

EN EN standards are voluntary technical standards of the European Union and European Economic Area.

encoding The protocol by which particular data patterns are changed prior to being written on the tape surface as a pattern of On and Off or 1 and 0 signals.

erase The removal of data from a piece of media.

error A message that occurs when there is a loss of ability to interpret recorded data. Usually due to magnetic issues or defects in or on the media.

Error Correction Code See ECC.

Error Detection Code See EDC.

ESD An Electrostatic Discharge is a sudden flow of electric current through a material that is normally an insulator.

Ethernet a local-area network (LAN) protocol using high-speed communications.

EU European Union.

F

FCC Federal Communications Commission. A United States agency responsible for enforcing communications related regulations stating how much radiation computers and other electronic equipment are allowed to emit.

firmware Permanent or semi-permanent instructions and data programmed directly into the circuitry of programmable read-only memory or electronically-erasable programmable read-only

memory chips. Used for controlling the operation of the computer or tape drive. Distinct from software, which is stored in random access memory and can be altered with ease.

format A magnetic track pattern that specifies the locations of the tracks and sectors. This information must exist on a tape before it can store any user data. Formatting erases any previously stored data.

formatted capacity The amount of room left to store data on a tape after writing the sector headers, boundary definitions, and timing information during a format operation.

FTP File Transfer Protocol. A protocol for exchanging files over any TCP/IP based network to manipulate files on another computer on that network regardless of which operating systems are involved (if the computers permit FTP access).

full height Dimensions of a drive that meet standard height requirements, usually 3.25 inches (82.55 mm) for a tape or disk drive product.

G

GB Gigabyte. A unit of measurement equal to 1 million kilobytes.

GHz Gigahertz. A measurement of frequency that equals one thousand million Hz, or one thousand MHz. Speeds for computer microprocessors, buses, and interfaces are often measured in GHz.

GS German Safety.

H

half height Standard drive size equivalent to half the vertical space of a 5.25 inch (133.35 mm) drive.

hard error A data error that persists when the tape is reread, usually caused by defects in the physical surface.

Hierarchical Storage Management (HSM) A method of storing massive amounts of data in tape libraries that allows for easy and rapid recall of the material. Due to the lowering cost of disk drives, HSM has yet to reach its full potential.

HiFN An ASIC (Application Specific Integrated Circuit) for the SDLT that handles data compression.

HIM The Host Interface Module implements the interface between the host system and the tape drive.

HRE Hard Read Error.

HTTP HyperText Transfer Protocol - The protocol for moving hypertext files across the Internet. Requires an HTTP client program on one end, and an HTTP server program on the other end. HTTP is the most used protocol on the Internet.

HWE Hard Write Error.

Hz Hertz. A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

IEC The International Electrotechnical Commission is a standards organization that prepares and publishes international standards for all electrical, electronic, and related technologies.

IEEE Institute of Electrical and Electronics Engineers

image backup A backup option that takes a "snapshot" of an entire system by writing a volume image to tape sector-by-sector, rather than file-by-file. This method of backup is very fast and allows companies to backup critical information in a limited backup window.

IP Internet Protocol. An IP address (or Internet Protocol address) is a unique address used in order to identify and communicate between devices on a computer network utilizing the Internet Protocol standard.

ISO The International Organization for Standardization is an international non-governmental standard-setting body made up of representatives from national standards bodies.

ISV Independent Software Vendor.

K

KB Kilobyte. A unit of measure consisting of 1,024 bytes.

kHz Kilohertz. A measurement of frequency that equals 1000 Hz.

L

LAN Local Area Network. A computer network covering a relatively small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD Liquid Crystal Display. The technology used by portable computer and flat-panel displays. The Operator Control Panel on the front of the SuperLoader is an LCD screen.

LED Light Emitting Diode.

Lempel-Ziv Algorithm A data compression technique used in all DLT tape drives. Named after Abraham Lempel and Jacob Ziv.

LGMR Laser Guided Magnetic Recording.

M

MAM Medium Auxiliary Memory (MAM) is an SDLT 600A tape drive feature that provides information on the status and prior use history of a Super DLTtape cartridge.

MB Megabyte. A unit of measurement equal to 1 million or 10^6 bytes.

media The material or device used to store information in a storage subsystem, such as a tape or disk drive. DLTtape media is a high-grade metal particle (MP) formulation that takes advantage of the latest advances in binder chemistry. By combining both solid and liquid lubricants in the tape binder system, tape and head wear are reduced while repelling airborne particles that could affect read/write head performance. In addition, by using a uniform particle shape, a dense binding system, a smooth coating surface, and a specially selected base file, Quantum DLTtape half-inch cartridge tapes take advantage of shorter wavelength recording schemes to ensure read compatibility with future generations of DLT drives.

MCBF Mean Cycles Between Failures. This is average cycle count between possible failures. A cycle is the movement of a cartridge from the tape drive to a magazine slot and the selection of another cartridge and moving that cartridge back to the drive.

Metadata "data about data" or any information about the content of a file (i.e. creation date, size, and in the case of video, compression standard, number of frames, etc.)

MHz MegaHertz. A measurement of frequency in millions of cycles per second.

microsecond (µs) One millionth of a second (.000001 sec.).

millisecond (ms) One thousandth of a second (.001 sec.).

MTTR Mean Time to Repair. The average time it takes to repair a drive that has failed for some reason. This only takes into consideration the changing of the major subassemblies such as the printed

circuit board or sealed housing. Component-level repair is not included in this number as this type of repair cannot be performed in the field.

MTBF Mean Time Between Failures. Reliability rating indicating the expected failure rate of a product in power on hours (POH).

MXF Material eXchange Format. A television industry standard for wrapping video and audio essence along with metadata into a file format recognized by many manufacturers.

N

native capacity The capacity of a given media product in its basic recording format (without the use of data compression).

native mode Refers to the uncompressed storage capacity of a media subsystem. (See "native capacity".)

O

OEM Original Equipment Manufacturer.

operational pattern This term is used to designate the complexity of an MXF file. It describes the possibilities for building the *material packages*.

overwrite To write data on top of existing data thus erasing the original data.

P

parity A method of generating redundant information that can be used to detect errors in stored or transmitted data.

peak transfer rate The maximum speed with which information moves inside a tape drive or between drive and host. Usually measured in megabytes per second.

performance A measure of the speed of the drive during normal operation. Factors affecting performance are seek times, transfer rate, and command overhead.

peripheral A device added to a system as a complement to the basic central processing unit (CPU), such as a disk drive, tape drive, or printer.

POH Power-on Hours. The unit of measurement for mean time between failure (MTBF), expressed as the number of hours that the drive is powered on. See MTBF.

POST Power-on Self Test. Diagnostic programs, loaded automatically by the BIOS, that perform basic tests on the major system

components, such as memory, cartridge and magazine information. If no problems are detected during POST, the system continues the start-up process.

R

RAM Random Access Memory. an integrated circuit memory chip that allows information to be stored and retrieved by a microprocessor or controller. The information can be stored or accessed in any order, and all storage locations are equally accessible.

random access The ability to directly locate any piece of data without having to read everything in memory or on disk.

read after write A mode of operation that has the computer read back each data block immediately after it is written on the tape, checking that the data read back is the same as recorded.

read/write head The mechanism by which data is recorded onto magnetic media in a tape drive system. See read after write.

Reed-Solomon error correction An error correction technique based on research done by Irving reed and Gustave Solomon at MIT's lincoln Laboratory in the 1960s. First used to check the accuracy of data received from the Voyager spacecraft.

restore To replace data on the hard drive with data obtained from another media device.

RoHS Restrictions on Hazardous Substances is an EU directive that restricts, and in some cases bans, the use of certain compounds in the manufacture of electronic equipment. RoHS mandates that new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, poly-brominated biphenyls (PBB), or poly-brominated diphenyl ethers (PBDE).

ROM Read Only Memory. Integrated circuit chip containing programs and data that can be accessed and read but cannot be modified.

S

SAN Storage Area Network.

scalability Refers to the capability provided by the DLT tape drive family to read tapes from previous generations of drives. Allows users to upgrade to a faster, higher capacity DLT drive, yet still be able to read tape recorded on an older system. The term also refers to the ability of DLT tape library systems to be upgraded with a higher performance DLT drive and thus provide more

capacity and performance in the same footprint. See backward compatibility.

SDLT Super Digital Linear Tape.

seek The movement of a read/write head to a specific data track.

self-cleaning head Found in all DLT tape drives. Tiny ridges on either side of the DLT drive read/write head continuously wipe the tape clean as it passes over the head. This is why there is no periodic cleaning prescribed for DLT tape drives.

server A powerful computer system with a large capacity tape or hard disk drive that serves the information access and communication needs of multiple users.

shelf life The length of time that media can be stored without losing its magnetic strength. For Super DLTtape II media, this period is 30 years or more.

shock rating A rating, expressed in Gs which stands for multiples of gravity, of how much shock a tape drive can sustain without damage. Operating and non-operating shock levels are usually specified separately.

SITE This command is used for site-specific commands. Compliant to FTP norm.

SMTP Simple Mail Transfer Protocol. An e-mail protocol on the Internet that defines the message format and the message transfer agent.

SNMP Simple Network Management Protocol. A protocol that monitors and controls a network.

SNTP Simple Network Time Protocol. SNTP is based on NTP, the Network Time Protocol, an industry standard way for computers to synchronize their time to an external reference standard. NTP and SNTP are fully interoperable. Each consists of a client, for example the SuperLoader, which obtains the current time (in UTC) from either an SNTP server or an NTP one. SNTP and NTP are in wide use on the Internet. NTP is specified by RFC1305. SNTP is specified by RFC2030.

soft error A faulty data reading that does not recur if the same data is reread from the disk or corrected by ECC. Usually caused by power fluctuations or noise spikes.

SRAM Static RAM. A memory chip that requires power to hold its content.

sustained transfer rate The data transfer rate of a tape drive in native mode.

tar A UNIX operating system command that stands for "create tape archives" and/or extract files.

TCP/IP Transmission Control Protocol/Internet Protocol. The Internet protocol suite is the set of communications protocols on which the Internet and most commercial networks run. It has also been referred to as the TCP/IP protocol suite, which is named after two of the most important protocols in it: the Transmission Control Protocol (TCP) and the Internet Protocol (IP), which were also the first two networking protocols defined.

timecode Timecode information can be recorded within an MXF file. Given that an MXF file can have several outputs (MXF terminology: *material package*), each of them can be set to a different timecode.

transfer rate The rate at which the drive sends and receives data from the controller. Usually measured in megabytes per second. The SDLT 600A drive has a native transfer rate of 35 MB/s.

U

UL Underwriters Laboratories is a testing laboratory, which develops standards for consumer products, chiefly dealing with product safety.

unformatted capacity The total number of usable byes on the media, including the space that will be required later to record location, boundary definitions, and timing information. (See also native capacity.)

URL Uniform Resource Locator - The address of a site on the Internet.

V

VCCI Voluntary Control Council for Interference by Information Technology Equipment (Japan).

virtual file A kind of edit list used only for the partial restore of .mxf files. Storing a file means creating a copy of a file from your local disk and transferring it to tape. Retrieving a file is the reverse operation. A transfer can be a store or a retrieve.

volume The quantity of information written on a piece of media. Typically measured in megabytes or gigabytes.

W

Web server A computer that stores Web documents and makes them available to other computers via a web browser. A server may be dedicated, meaning its sole purpose is to be a Web server, or non-dedicated, meaning it can be used for basic computing in addition to acting as a server.

WEEE Waste Electronic and Electrical Equipment is an EU directive that mandates that producers of electronic goods assume the responsibility of recycling WEEE and create sustainable development programs to design more easily reusable and recyclable products.

WORM Write Once, Read Many. An optical disk technology that allows the drive to store and read back data but prevents the drive from erasing information once it has been written.

write protected Files or media that cannot be changed. Use write protection when you want to protect data from being changed or destroyed. To write protect most tape cartridges, slide the write-protect tab to the "locked" position.

Z

Zeroconf see Bonjour