Oracle® Virtual Operator Panel

User's Guide

Release 2.2

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Preface

This guide describes how to use Oracle Virtual Operator Panel (VOP) to monitor and control tape drives.

Audience

This document is intended for VOP system administrators and operators.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Documents

Visit the Oracle Technical Network (OTN) at the following URL to access publications for StorageTek libraries, tape drives, and associated software and hardware:

http://docs.oracle.com

Access Oracle ASR related publications at the following URL:

http://www.oracle.com/technetwork/systems/asr/documentation/index.html

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Introduction

Oracle Virtual Operator Panel (VOP) is a suite of software applications that allow you control and monitor the functionality of different tape drives. VOP provides different modes of access to specific tape library functions.

VOP applications provide an intuitive and user-friendly graphical user interface (GUI) to display drive-related information, to configure the drive, or to perform various drive operations.

VOP consists of two main components:

- VOP client
- VOP server (SDP2 Service Delivery Platform 2)

The VOP client can be run in standalone mode (directly connected to a specific devices) or can be connected to the VOP server to direct all traffic through the server.

The VOP server serves as a single point of access to all devices, and is designed to reduce the number of device connections. It provides automated ASR functions and allows for additional logs to be collected.

VOP is designed for customers who have an existing Oracle service contract for their tape drives and libraries.

VOP includes the following applications:

- "Multi-Drive Virtual Operator Panel (MD-VOP)"
- "T10000 9840D VOP"
- "LTO VOP"
- "9XXX VOP"
- VOP Server

Multi-Drive Virtual Operator Panel (MD-VOP)

This application enables you to control and monitor a variety of tape drives in multiple libraries. This allows for a standalone or client/server configuration.

MD-VOP supports the following StorageTek libraries:

- SL8500
- SL3000
- SL500
- SL150

- L700/L1400

- 9310

MD-VOP supports the following tape drives:

- StorageTek T10000A, T10000B, T10000C, and T10000D

- StorageTek T9840D

- HP LTO-4, LTO-5, and LTO-6 (encryption capable)

- IBM LTO-4, LTO-5, and LTO-6 (encryption capable)

T10000 9840D VOP

This application enables you to control and monitor a single Oracle StorageTek T10000A, T10000B, T10000C, T10000D, or T9840D tape drive.

LTO VOP

This application enables you to control and monitor a single encryption-enabled HP or IBM Linear Tape Open (LTO) Ultrium LTO-4, LTO-5, or LTO-6 tape drive.

9XXX VOP

This application enables you to control and monitor a single Ethernet-connected Oracle StorageTek T9x40 series tape drive.

> **Note:** You can access the single-drive VOP applications within the MD-VOP interface, or run them as standalone applications.

VOP Server (SDP2)

This application serves as a single point of access to all devices, and is designed to reduce the number of device connections. It provides automated ASR functions and allows for additional logs to be collected.

The server can be accessed by multiple GUIs. The GUI enables you to view and control your devices. It is also used to set up the server configuration.

The VOP server is installed separately. It is not installed as part of the MD-VOP installer.

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Obtaining VOP

This chapter describes how to obtain VOP.

> **Note:** VOP includes StorageTek MD-VOP, along with the T10000 9840D VOP, LTO VOP, and 9XXX VOP single drive applications. You can access these applications within the MD-VOP interface, or run them as standalone applications.

VOP is available for download from the Oracle Software Delivery Cloud and the My Oracle Support page.

Downloading VOP from the Oracle Software Delivery Cloud

To obtain VOP, do the following:

1. Create a local destination folder for the VOP download. If you are using Linux or UNIX, create this folder as a direct subordinate to the root (home folder).

2. Launch your web browser and access Oracle's Software Delivery Cloud at the following URL:

   http://edelivery.oracle.com

3. On the Welcome page, click **Sign In/Register**.

4. Enter the Username (ID) and Password provided by your Oracle support representative and then click **Sign In**.

5. On the Terms & Restrictions page, read the License Agreement and Export Restrictions, and select the check boxes to indicate your acceptance. Then click **Continue**.

6. On the Media Pack Search page, click the **Select a Product Pack** menu, and select **Oracle StorageTek Products**.

7. Click the **Platform** menu, and select **Generic Platform**.

8. Click **Go**.

9. In the list of available products, select **Oracle Virtual Operator Panel** and click **Continue**.

10. Click **Download** and save the media pack .zip file to the destination folder you created in Step 1.

    Separate VOP installers for Windows, Solaris Sparc, Solaris x86 and Linux86 are extracted. You may delete those installers that do not apply.

Additionally, the zip file includes both the server and client components.

A Readme file is also included. Read this document before installing VOP.

Downloading VOP from My Oracle Support (MOS)

The My Oracle Support (MOS) page includes the officially released version of VOP, along with VOP patch releases.

To obtain VOP, do the following:

1. Create a local destination folder for the download. If you are using Linux or UNIX, create this folder as a direct subordinate to the root (home folder).

2. Launch your web browser and access the My Oracle support (MOS) page at the following URL:

   http://myoraclesupport.com

3. Click **Sign In**.

4. Enter the Username (ID) and Password provided by your Oracle support representative and then click **Sign In**.

5. Click the **Patches and Updates** tab.

6. Under **Product**, locate Oracle Virtual Operator Panel.

7. Download the desired version or patch release.

3

Requirements

This chapter describes VOP pre-installation requirements.

User Roles

VOP is available in two versions, designed for the following customer roles:

- System Administrator

  This version of VOP is designed for the system administrator who configures and controls the VOP configuration.

- Operator

  This version of VOP is designed for the operator who monitors the configuration. In this version, the operator can only manipulate a single tape drive at one time.

Each of these versions can be run in either standalone or client/server mode.

System Requirements

This section describes MD-VOP system requirements.

> **Note:** In a client/server configuration, you must install the client and server on separate instances of the operating system. You cannot run these as the same user.

Client

The VOP client requires the following:

Operating System Requirements

VOP is supported on the following operating systems:

- Linux Kernel (2.6.18 or later), Redhat 9.0, ES

  - Some Linux installations may require you to install additional libraries.

  - The use of VMWARE and additional programs is supported. However, these may require you to configure ports and permissions as necessary.

- Solaris 10/Solaris 11 (Sparc and x86)

- Microsoft Windows XP (with Service Pack 3), Windows 7, or Windows 8

The VOP package includes separate installers for each of these operating systems.

Additional Requirements

The following are required:

- 2 GHz processor

- Disk Space: Approximately 40 GB

- Memory: 4 GB

- Monitor screen resolution 1024x768 (minimum)

- Available Ethernet port for static IP addressing

- RJ45-RJ45 Ethernet cross-over cables (direct connection to a tape drive or drive tray)

- RJ45-RJ45 Ethernet cables (connection through an Ethernet switch)

Server

The VOP server requires the following:

Operating System Requirements

The VOP server is supported on Oracle Linux 6.4 (recommended). It includes a Sun Java 32 bit version. The server software will attempt to automatically determine whether a Sun Java 64 bit version is available for use.

> **Note:** The server is designed to run without cohosting other applications. If you require cohosting with another program, open a Request for Enhancement request (RFE).

Additional Requirements

- 4 core processor (minimum)

- 8GB RAM (minimum)

- Disk Space: 100GB

- Recommended minimum of 3 Ethernet ports (one for outgoing access and 2 for incorporating the private network to the devices)

- RJ45-RJ45 Ethernet cables (connection through an Ethernet switch)

- Switch for the private network that will support VLAN (required)

- Layer 2 switch

> **Note:** You may need to increase the server size depending on the number and type of devices present.

Java Runtime Environment Requirement

VOP applications are Java-based. During installation, a local copy of the Java Runtime Environment (JRE) is placed in the installation directory for exclusive use by the VOP applications.

VOP requires JRE version 1.7 or higher. It is recommended that you use the local copy of Java included, as the java version can affect the application.

Library and Tape Drive Requirements

This section describes MD-VOP library and drive support.

MD-VOP Library Support

MD-VOP supports multiple tape drives at the library level.

The following table lists libraries supported by MD-VOP, along with required minimum firmware levels:

Table 3–1   MD-VOP Library Support

Library/Component	Minimum Firmware Requirement
SLS8500	FRS 4.70, FRS 4.14, FRS3.98b
SL3000	FRS 2.05, FRS 2.30
SL500	V1373
SL150	2.25
L700/L1400	3.18.02
9310	All
Library Console	FRS 4.00

MD-VOP Tape Drive Support

The following table lists tape drives supported by MD-VOP, along with required minimum firmware levels:

Table 3–2   MD-VOP Tape Drive Support

Tape Drive	Minimum Firmware Requirement
T10000A	1.44.111
T10000B	1.44.211
T10000C	1.51.316
T10000D	408.105
T9840D	1.45.703
HP LTO4*	H58S (Fibre Channel) B57S (SCSI)
IBM LTO4*	94D7
HP LTO 5*	I5BS
IBM LTO 5*	BBNH/2.36.23
HP LTO 6*	Contact Oracle Support for supported list.
IBM LTO 6*	Contact Oracle Support for supported list.
VSM 4/5	Contact Oracle Support for latest version.

* LTO encryption-capable tape drives only

MD-VOP Placeholder Tape Drive Support

You can manually add tape drives to the MD-VOP configuration to provide placeholders as an indication that there is a tape drive in a particular slot.

The following table lists supported placeholder tape drives, along with required minimum firmware levels:

> **Note:** 9XXX drives are non-reactive. You can obtain logs for these drives, however, they do not show loaded/unloaded state.

Table 3–3   MD-VOP Placeholder Tape Drive Requirements

Tape Drive	Minimum Firmware Version
T9840B, T9840C, T9940A, T9940B	T9840B - 1.44.310
	T9840C - 1.45.503
	T9940B - 1.44.410
LTO 2/3/4 (non encrypting) and T9840A	NA

MD-VOP ASR Capable Drive Support

MD-VOP allows the user to create a service request in My Oracle Support (MOS) and automatically transmit logs for Oracle Support review. The following devices are supported:

- Oracle StorageTek SL8500, SL3000, SL500, and SL150 libraries
- Oracle StorageTek T9x40 and T10000 series tape drives
- VSM 4/5 (only in client/server mode)

This feature requires a valid service contract. Also, devices must be activated in MOS for processing. See "ASR" on page 7-15 for more information about this feature.

T10000 9840D VOP Drive Support

The following table lists tape drives supported by T10000 9840D VOP, along with required minimum firmware levels:

Table 3–4   T10000 9840D VOP Tape Drive Support

Tape Drive	Minimum Firmware Requirement
T10000A	1.44.111
T10000B	1.44.211
T10000C	1.51.316
T10000D	TBD
T9840D	1.45.703

LTO VOP Drive Support

The following table lists tape drives supported by LTO VOP, along with required minimum firmware levels:

Table 3–5   LTO VOP Tape Drive Support

Tape Drive	Minimum Firmware Requirement
HP LTO 4	H58S (Fibre Channel)
	B57S (SCSI)
HP LTO 5	I5BS
HP LTO 6	TBD
IBM LTO 4	94D7
IBM LTO 5	BBNH/2.36.23
IBM LTO 6	TBD

9XXX VOP Drive Support

The following table lists tape drives supported by 9XXX VOP, along with required minimum firmware levels:

Table 3–6   9XXX Tape Drive Support

Tape Drive	Minimum Firmware Requirement
T9840B, T9840C	T9840B - 1.44.310
	T9840C - 1.45.503
	T9940B - 1.44.410
T9940A, T9940B	T9940B - 1.44.410

Configuration Considerations

Review the following additional considerations:

Ethernet Connection to the Drive

To use VOP with a drive, you must have an Ethernet connection from your computer to the Ethernet port on the tape drive or drive tray rear panel.

- For a direct connection to the drive, you must use a single crossover Ethernet cable.

- For an indirect connection (through an Ethernet switch), you must use a straight Ethernet cable to connect your computer to the switch. The switch-to-drive cable should already be connected.

Service Network

VOP is designed to operate on the service network configured as a private LAN. It uses the service network Ethernet port for communications. This port can also be used by other applications, such as:

- Oracle Key Manager (OKM), formerly Key Management System (KMS), used for secure encryption of tape drives.

- Oracle Service Delivery platform (SDP), used for delivery of fast and accurate service.

The private LAN recommendation ensures security from unauthorized access. Refer to the *Oracle Key Manager Systems Assurance Guide* for more information about the service network.

Additional Considerations

The following are additional considerations:

- When configuring the tape drive network, adhere to the guidelines included in your tape drive publications. A qualified service representative should implement the tape drive network.

- If MD-VOP is the only program installed, the following are recommended:
  - Connect the tape drive Ethernet port on a private network.
  - Use static IP addresses, not dynamic addresses.
  - Use Level 2 switches to isolate each library (highly recommended)
  - Ensure that the latest firmware is loaded on all tape drives.

- The IP address for a new tape drive defaults to 10.0.0.1. When you configure the network and tape drives, be sure to configure one tape drive at a time as you add them to the network.

- MD-VOP configuration requires a unique IP address to be assigned for each tape drive.

- If the configuration environment includes SDP, contact your SDP service representative to assist in assigning IP addresses.

- Though VOP and VOP server can coexist, it is recommended that you do not mix these modes in most situations. A limited number of connections to the tape drives is permitted.

- When the VOP server is used, a VLAN is required between the tape drives, libraries, and the VSM. The VLAN must reside on a separate IP to the server. This should be a private service network to the devices with private ports to the devices.

- The VOP server requires static IP addresses.

4

Installing VOP

This chapter describes how to install and uninstall VOP applications.

> **Note:** The VOP server (SDP2) is installed separately. It is not installed as part of the MD-VOP installer. See "Installation" on page 5-6 for more information.

Default VOP Installation and File Directories

The following sections list the default installation and user file directories used by VOP, based upon the version installed.

> **Note:** You can specify a different installation directory during the installation process. You can also modify MD-VOP launch scripts to change the default user file directory. See Appendix A, "Changing the Default MD-VOP User File Directory" for more information.

System Administrator Version

User is the user name currently logged in.

Windows Platform

VOP is installed in the following directory:

```
C:\Program Files\Multi Drive VOP SysAdmin
```

VOP stores user created files in the following directory:

```
Documents and Settings/User/.mdvop
```

All Other Platforms

VOP is installed under the User home directory, in a subdirectory named `mdvop_sys`.

VOP stores user created files under the User home directory, in a subdirectory named `.mdvop`.

Operator Version

`User` is the user name currently logged in.

Windows Platform

VOP is installed in the following directory:

`C: \Program Files\Multi Drive VOP Operator`

VOP stores user created files in the following directory:

`Documents and Settings/User/.mdvop`

All Other Platforms

VOP is installed under the `User` home directory, in a subdirectory named `mdvop_operator`.

VOP stores user created files under the `User` home directory, in a subdirectory named `.mdvop`.

Installing VOP

The VOP installer automatically installs MD-VOP, along with the following single-drive VOP applications:

- T10000 9840D VOP

- LTO-VOP

- 9XXX VOP

During installation, you may choose whether to create desktop shortcuts for each VOP application.

To install VOP:

1. Navigate to the folder that contains the VOP installer files you downloaded in Chapter 2, "Obtaining VOP".

2. Run the appropriate installer for your operating system.

    - For Windows, double-click the executable (.exe) Windows file.

    - For UNIX, enter `./filename` from a terminal screen, where `filename` is the MD-VOP install file you want to run.

3. When the initial dialog box appears, click **Yes** to continue.
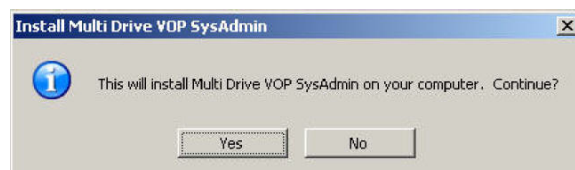
4. When the Welcome screen appears, click **Next** to continue.

5. Read the license agreement and click the confirmation box to accept the terms. Then click **Next** to continue.

> **Note:** If a previous version of MD-VOP is detected on your system, the program prompts you to remove the previous version. This is recommended, as running multiple versions of MD-VOP simultaneously may cause unpredictable results.

6. Specify the desired destination folder for installation. Then click **Next** to continue.
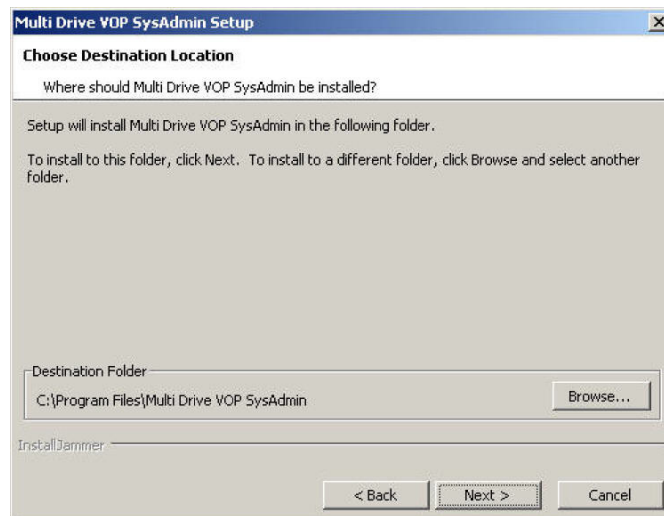
7. Select whether to display the encryption tab in this installation of MD-VOP. Then click **Next** to continue.
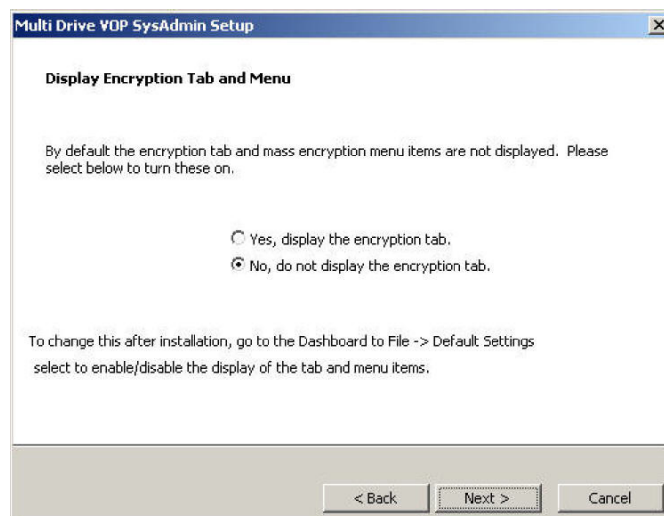
8. Select whether you want the permanent encryption tab to be visible. Then click **Next** to continue.

9. Confirm your setup options and click **Next** to begin installation.
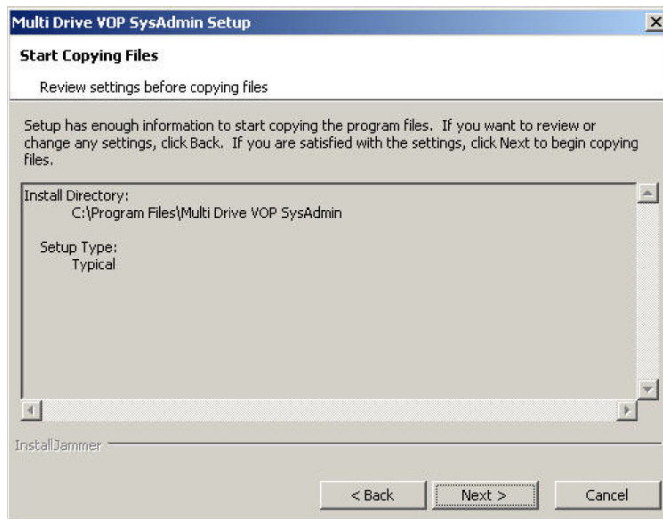
> **Note:** Please wait as VOP installs. A status bar appears to indicate installation progress.

10. Select your environment options and then click **Finish**.
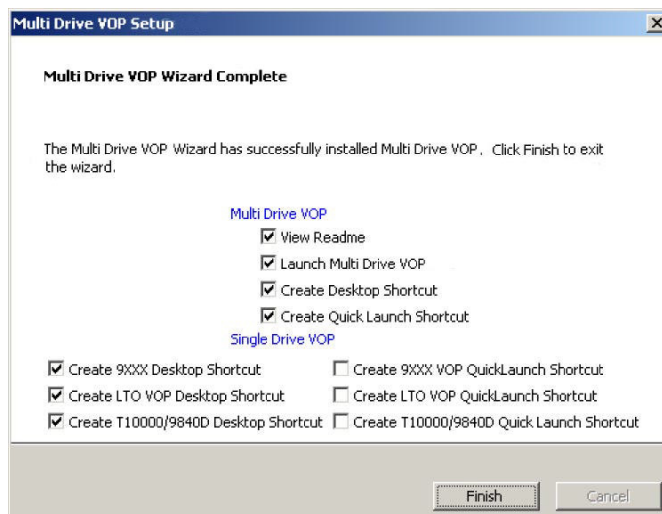
Environment options include the following:

Multi-Drive VOP:

- View ReadMe - Displays the MD-VOP ReadMe file.

- Launch Multi-Drive VOP - Starts MD-VOP after installation is complete.

- Create Desktop Shortcut - Creates an MD-VOP desktop shortcut.

- Create Quick Launch Shortcut - Creates an MD-VOP icon in the Quick Launch toolbar.

Single Drive VOP:

- Create 9XXX VOP Desktop Shortcut

- Create 9XXX VOP Quick Launch Shortcut (Windows only)

- Create LTO VOP Desktop Shortcut

- Create LTO VOP Quick Launch Shortcut (Windows only)

- Create T10000 9840D Desktop Shortcut

- Create T10000 9840D VOP Quick Launch Shortcut (Windows only)

11. Installation is complete.

- If you selected **Launch Multi-Drive VOP** in the previous step, the MD-VOP application launches. See "Launching MD-VOP for the First Time" on page 6-1.

- If you did not select **Launch Multi-Drive VOP** in the previous step, the installer closes. See Chapter 6, "Starting VOP".

Windows 7 File Permissions

If you installed VOP in Windows 7, you must ensure that permissions for the tmp, ftptemp, and ID directories (located in the VOP installation directory) are set to allow the current user to write to these directories. The VOP application uses these directories for temporary space when transferring files. If permissions are not set correctly, then certain features (for example, retrieving dumps) will not be available.

To set permissions:

1. In Windows Explorer, locate the directory.

2. Right-click the directory and then select **Properties**.

3. Click the Security tab and select **Edit**.

4. Select the current user or users (Current User\Users) and then select **Full control**.

5. Click **Apply**.

6. Click **OK**.

7. Click **OK** again.

Un-Installing VOP

All configurations and logs are retained after VOP is removed.

To Un-Install VOP (Windows)

Do the following:

1. Exit all running instances of VOP.

2. Perform one of the following steps:

   ■ From the Windows Start Menu, select **All Programs**, then **Multi-Drive Virtual Operator Panel**, and finally, **Uninstall Multi-Drive Virtual Operator Panel**.

   ■ From the VOP installation directory, run **uninstall.exe**.

3. An Uninstall Confirmation dialog appears. Click **Yes** to uninstall VOP.

4. When uninstall is complete, a confirmation screen appears.

To Un-Install VOP (UNIX)

Do the following:

1. Exit all running instances of VOP.

2. Enter the following command:

   ```
   # cd <parent directory above the VOP installation directory>
   ```

   > **Note:** You must be one level above the installation directory. Otherwise, the terminal will lose the path.

3. Enter the following command:

   ```
   # ./mdvop_sys/uninstall
   ```

4. When uninstall is complete, a confirmation screen appears.

5

VOP Client/Server Overview

This chapter describes how to use VOP in a client/server configuration.

VOP consists of two main components:

- VOP client
- VOP server (SDP2 Service Delivery Platform 2)

The VOP client can be run in standalone mode (directly connected to a specific devices) or can be connected to the VOP server to direct all traffic through the server.

The VOP server serves as a single point of access to all devices, and is designed to reduce the number of device connections. It provides automated ASR functions and allows for additional logs to be collected.

VOP Client

The VOP client is designed to control and update the maintenance for different tape drives. It can be run in standalone mode (directly connected to a specific devices) or can be connected to the VOP server to direct all traffic through the server. In the MDVOP application, a configuration file tracks different configurations.

Figure 5–1 shows a standalone VOP client, which includes a direct connection to each device.

Figure 5–1   VOP Standalone Client Configuration
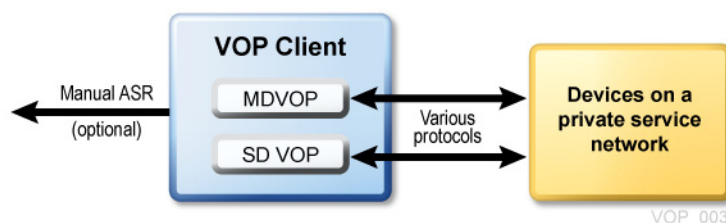
VOP Server

The VOP server serves as a single point of access to all devices, and is designed to reduce the number of device connections. It provides automated ASR functions and allows for additional logs to be collected. You can configure multiple VOP clients to communicate with the VOP server.

Figure 5–2 shows a VOP Client/Server configuration, which includes multiple VOP clients communicating with the VOP Server to manage devices.

Figure 5–2   VOP Client/Server Configuration
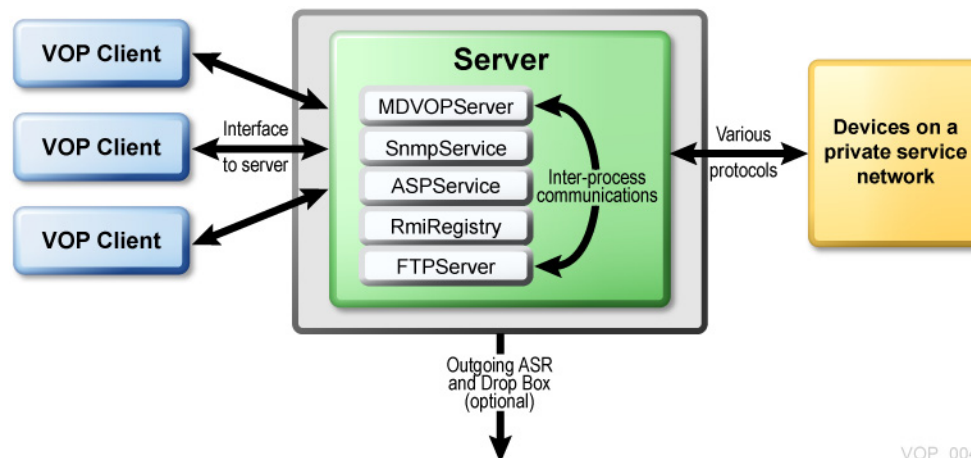
As shown in the Figure 5–2, The VOP server contains multiple applications that run as Linux modules. These applications provide the main communication to each protocol as a central location for different devices and access.

Each module provides a specific function:

- MDVOPServer

  This module provides the GUI interface to the server and the main control system for the tape drives.

- SnmpService - SNMP (simple Network Management Protocol)

  This module receives events from different devices and controls all aspects of monitoring and maintaining processing.

- ASPService - ASP (ASR Service Plus)

  This module controls ASR and VSM related functions. It is responsible for sending alerts.

- RmiRegistry - RMI (Remote Method Invocation)

  This module provides the default level of communications between the GUI and server and also for inter process communication. This module is the default RMI installed.

- FTPServer

  This module receives alerts from the 9xxx tape drives.

Clients connect to the server through the RMI interface. The server handles any interaction through a private service network to the devices. This communication is local only. ASR and the drop box are the only outgoing interfaces that can be enabled or disabled.

The server uses a ***domain.vop*** file to control which devices are monitored. This file is only used by the server. To be monitored, the device must be included in this file. Any change to this file (for example, new device, change in IP) require the services to be restarted.

The VOP client uses a client ***configuration file***. This file is a copy of the domain.vop file, or can be a subset of this file so that it includes only the devices you are interested in. If the domain is changed for selective areas, you must update the client configuration file.

ASR

VOP can be used with Automated Service Request (ASR) to manage devices and collect logs by default. The ASR component must be enabled to function.

ASR is a feature of Oracle Premier Support for Systems and Oracle Limited Warranty that is designed to automatically request Oracle service when specific hardware faults occur. You can use ASR to manually or automatically request the creation of a service case. You must have a service contract for the device.

ASR is designed to resolve problems more quickly by eliminating the need to initiate contact with Oracle services for hardware failures, reducing both the number of phone calls needed and overall phone time required. ASR also simplifies support operations by utilizing electronic diagnostic data. ASR is easy to install and deploy is completely controlled by you to ensure security.

The ASR back-end infrastructure at Oracle collects all telemetry data forwarded to it from the ASR Manager. The fault-rule technology on these back-end systems ascertains the reality of the fault telemetry, and forwards recognized faults to Oracle's Service Request system. From there, the following actions occur:

- A Service Request, also called a case, is created and assigned to an Oracle Support Engineer. At the same time, an e-mail notification of the Service Request is sent to your support contact on record associated with the system reporting a fault.

- The Service Request is handled in accordance with the asset's Support or Warranty contract.

For more information about ASR, refer to the ASR publications available at the following URL:

http://www.oracle.com/asr

Figure 5–3 shows an example of a configuration using a standalone VOP client. In this customer environment, VOP is directly connected to various devices. This allows for all general VOP functionality. All devices reside on the private service network.

Figure 5–3   ASR in a Standalone VOP Client Configuration
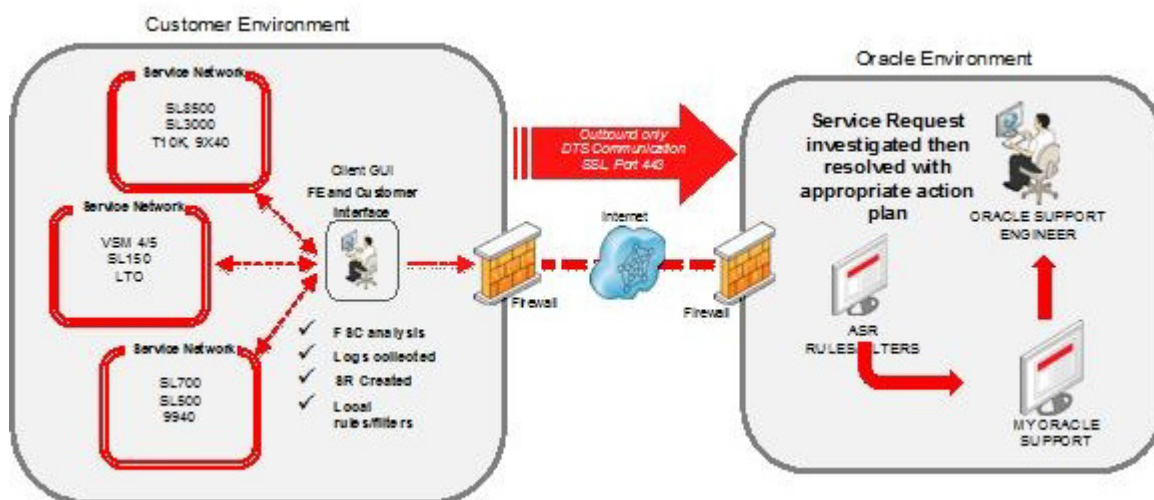
If the ASR component is enabled, then manual case creation can be performed through the DTS protocol to create the case and transfer logs. This protocol is sent through the secure layer.

Figure 5–4 shows an example of a configuration using a VOP client communicating with the VOP (SDP2) server. The VOP client communicates with the VOP server while the VOP server communicates with the devices. All VOP functionality is performed through the GUI and redirected to the server.

Figure 5–4   ASR in a VOP Client/Server Configuration
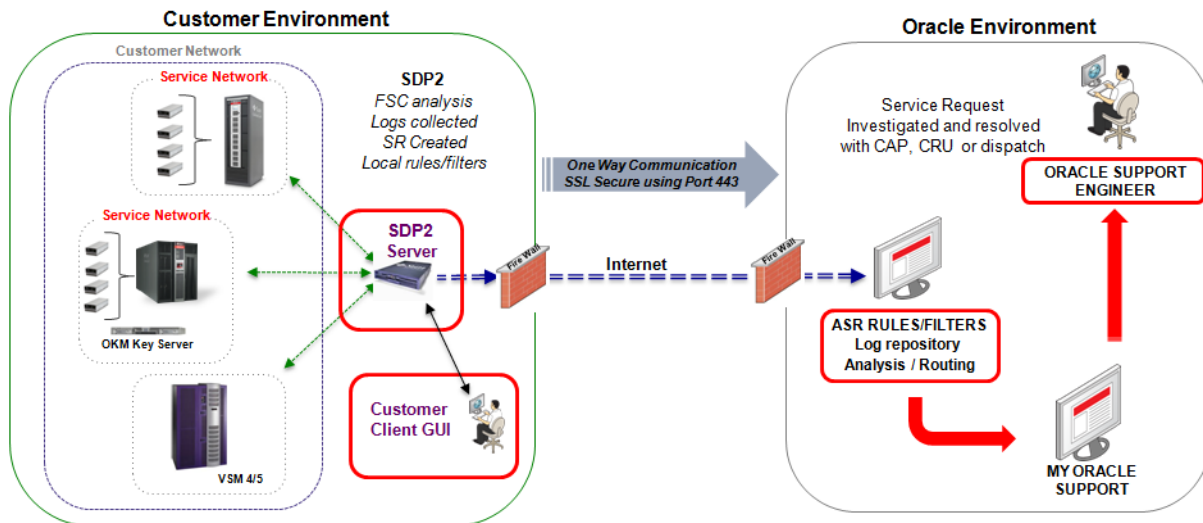
In this configuration, if the ASR component is enabled, then the VOP server can create alerts after monitoring the devices for problems. The VOP client can still create a manual ASR as needed.

Figure 5–5 shows the different modes you can use to use VOP to communicate with Oracle Support.

Figure 5–5   VOP Modes of Communication with Oracle Support
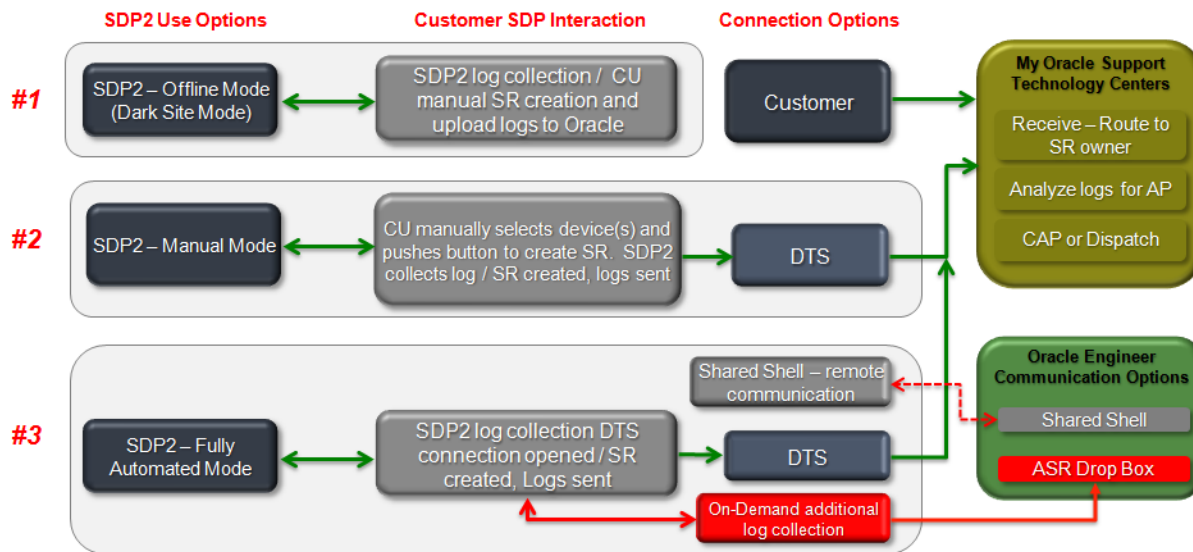
In each mode shown in Figure 5–5, the primary goal is to use VOP functionality to maintain the supported devices:

1. This mode is designed for access to devices, and allows for maintenance and support. If an issue must be uploaded, then the user can contact Oracle Support.

2. This mode includes a manually configured ASR, through either the standalone VOP client or the VOP server. The customer can manually create cases. VOP functionality to the devices is present.

3. This mode is designed for the creation of automated alerts. VOP functionality to the devices is present. Depending on customer requirements, this may allow Oracle support to remotely collect additional logs.

Installing the VOP Server

This section provides VOP server installation instructions and considerations.

Overview

The VOP server is installed as an RPM package installed from root. Before installing the VOP server, review the following server notes (assuming Oracle 6.4 Linux):

- The application is designed to run as a regular user called sdp2admin.
  - No special privileges for the account are required.
  - The account requires a home directory used for collecting logs. Ensure that this directory has an appropriate disk size.
  - All applications for this user run under this account.
  - Installation requires a configured account. If the installation system contains NIS, LDAP, or related packages, contact your system administrator and Oracle support as necessary.
- ip tables must be considered. Installing the application requires several ports to be open.
- SE Linux is modified to allow the local copy of Java to be used by this application.
- If root is required to run this application, contact Oracle support for details.

When you install the RPM package, the following actions occur:

- The sdp2admin account is created.
- The sdp2admin group is created.
- ip tables are modified to redirect SNMP to a higher port for the user to access and requests SE Linux to enable the included copy of Java to run.
- The application is installed under /opt/Oracle/Mdvopserver.
- Entries are placed under init to start the application.
- /etc/hosts is checked for an entry.

Library Complex Value

The Library Complex value is set by the SLConsole for each individual library. The customer or support representative can set or change this value.

Setting or changing this value impacts the VOP Server and StorageTek Tape Analytics (STA). The library complex value defines part of the IP address that is used in the private LAN ports for the library. This can cause the VOP Server (connected through a switch using a VLAN to the private network) to be unable to find the library. STA uses

the library complex value to identify a specific library complex. Changing this value can potentially cause loss of records for that library and associated tape drives.

Oracle recommends the following:

- Establish a common library complex value when installing the VOP server and StorageTek Tape Analytics.

- Once this value is established, do not change this value without careful consideration.

Changing this value is a user defined ability, and therefore cannot be controlled by additional software monitoring the environment.

Installation

To install the VOP server:

1. Edit the /etc/hosts file. To allow RMI to function properly, edit the hosts file with the IP address of the server along with the host name. Use a fully qualified host name.

   If this file is not present, the GUI cannot connect to the server. Currently, only one IP address is supported for the GUI connection.

   For example:

   ```
   [sdp2admin@ttx4200-2 bin]$ cat /etc/hosts
   127.0.0.1 localhost localhost.localdomain localhost6 localhost6.localdomain6
   10.10.10.102 mdvop_server.us.oracle.com
   ```

   In this example, the entry 10.10.10.102 mdvop_server.us.oracle.com is added to the /etc/hosts file. The host name and IP address identify the system for the installation.

2. Issue the following command to install the rpm package:

   > **Note:** If a previous version of the rpm package was installed, you must uninstall it. See "Upgrading and Uninstalling the VOP Server" on page 5-8 for more information.

   rpm --install *file_name*

   where *file_name* is the VOP server installation package.

   The installation displays all steps performed and the completed output displays additional notes to be reviewed.

   For example:

   ```
   [root@dr-sdp2-OEL64-x86-4 ~]# rpm --install
   MdvopServer-2.1.1-SNAPSHOT2013101519
   1816.i686.rpm
   pre 2.1.1
   Installing..........
   - Checking for Dependencies and creating a list that is needed.
   Please Wait....
   -(sdp2admin) exists!, No changes to Users Account
   Working.....
   post 2.1.1
   Post Script Running..........
   +Installing a local copy of Java into
   ```

```
/opt/Oracle/MdvopServer/jre1.7.0_25!
+Successful with JVM Installation! Deleting Compressed file
+Modify sdp2admin Bash Profile, Please check SDP2_JAVA_HOME
Environment to be set correctly!
+Running MDVOP (SDP2) Server Setup
+Creating sdp2admin cron entry!
-User:sdp2admin Previous Server settings detected. No changes will be made!
+Attempting to run Administration Activities for Mdvop Server
for first time with (root) privileges!
+Configured System for use with Mdvop Server with java
preference (stand alone)
+Attempting to setup Mdvop Server for first time with (sdp2admin_ privileges!
+Configuring system wide init scripts! Selected runlevel will be (3,5)
+Configuring logrotate for Mdvop Server Application Logs!
+Checking network hosts file for IP configuration needed for RMI services
Finished with Package installation
posttran 2.1.1
```

Configuring and Running the Server

Perform the following steps to verify and configure the VOP server (SDP2) basic settings:

1. Login as (sdp2admin) or <su - sdp2admin> as root.

2. <cd /opt/Oracle/MdvopServer> or alternatively use <cd SDP2_HOME> and then <ls>.

3. Verify permissions are sdp2admin:sdp2admin on folders.

4. If a local java was installed, this is the top level directory. Look for a Java folder (for example, jre1.7.0.25)

5. <cd bin> and then issue <ls>.

6. Verify that preinstallation is complete. If the file (jreConfig) is present, then a suitable Java has been found.

   Issue the command <./Server.sh config>. If successful, then the file will exist. Otherwise, you must manually configure it.

   Alternatively, issue <./detectJava.sh> and review the output to determine whether a JVM was found.

7. Issue <ls /setup> to verify that there is a directory (bin/setup).

   - If change (changeSnmpPort) exists, then the firewall was modified.
   - If change (secureJava) exists, then SE Linux is aware that a local copy of Java is being used.

8. As an administrator, verify that /etc/hosts file contains the server IP address and correct DNS name.

9. Issue <./Server.sh start> to start the Mdvop server services. After services start, issue <./Server.sh status> to verify that services are active.

Considerations

Note the following considerations:

- You can run the server from anywhere with the command <mdvop_server start>. Please do not run as root!

- General logs of the process are located in /opt/Oracle/MdvopServer/logs.

- If you receive a message indicating that a port is in use, verify that other RMI processes are not running.

- Local server documents are located in /opt/Oracle/MdvopServer/docs.

- Java search order is as follows:

  1. If this installation process was able to detect the correct machine architecture (i686), then a JRE (Java Runtime Environment) was installed under the top level directory.

  2. If you are using an x64 architecture, the JRE was not installed and the installation likely used the native operating system version detected.

  3. If the installer could not detect an architecture, then you must manually install a compatible version of Java.

     After you install Java, point the (/opt/Oracle/MdvopServer/bin/jreConfig) file to the parent directory of the JVM (Java Virtual Machine). For example:

     <which java> yields (/usr/bin/java)

     </usr/bin/java -version> yields (java version 1.7.0_25)

     <echo /usr > /opt/Oracle/MdvopServer/bin/jreConfig>

     Note: Use double quotes with echo!

     Verify with <cat /opt/Oracle/MdvopServer/bin/jreConfig> yields (/usr)

Starting the VOP Server

After installation and setup, the administrator can either restart the server or issue the following commands to start the application:

```
su - sdp2admin
mdvop_server start
```

See "Scripts" on page 5-9 for details.

To verify whether the VOP server is installed, issue the following command:

```
rpm -qa | grep -i mdvop
```

For example:

```
[root@dr-sdp2-OEL64-x86-4 ~]# rpm -qa | grep -i mdvop
MdvopServer-2.1.1-SNAPSHOT20130919151818.i686
```

Upgrading and Uninstalling the VOP Server

To upgrade to a newer version for this release, you must install and then reinstall the package. The following actions occur:

- All running modules are stopped.

- The /opt/Oracle/Mdvopserver is removed.

- The SNMP port entry in the iptables is removed.

- All settings are saved for reuse.

■ The user account sdp2admin is retained to retain existing configuration and additional data. If you want to perform a full removal of the application, you must manually remove this user.

To remove the VOP server, issue the following command:

rpm -e MdvopServer

For example:

```
[root@dr-sdp2-OEL64-x86-4 ~]# rpm -e MdvopServer
preun 2.1.1
Removing........
Stopping MDVOPServer: [ OK ]
Stopping SnmpService: [ OK ]
Stopping ASPService: [ OK ]
Stopping RmiRegistry: [ OK ]
+User:sdp2admin Mdvop Server Settings were archived in
/home/sdp2admin/MdvopServer-20131016084200OURCE-Settings.tar.gz
-User:sdp2admin was not removed from the System
postun 2.1.1
Removed Package, Cleaning up........
FINISHED
```

Scripts

Use the mdvop_server script to start and stop the VOP server. This script is included in the path for the account.

Using no arguments displays the available commands. For example:

```
[sdp2admin@dr-sdp2-OEL64-x86-4 ~]$ mdvop_server
Usage: /usr/local/bin/mdvop_server {start|stop|restart|reload|status}
```

To start the application, issue the following command:

mdvop_server start

For example:

```
[sdp2admin@dr-sdp2-OEL64-x86-4 ~]$ mdvop_server start
Starting RmiRegistry: [OK]
Starting ASPService: [OK]
Starting SnmpService: [OK]
Starting MDVOPServer: [OK]
[sdp2admin@dr-sdp2-OEL64-x86-4 ~]$
```

To stop the application, issue the following command:

mdvop_server stop

For example:

```
Stopping MDVOPServer: [OK]
Stopping SnmpService: [OK]
Stopping ASPService: [OK]
Stopping RmiRegistry: [OK]
```

To view the status of the application, issue the following command:

mdvop_server status

For example:

```
[sdp2admin@dr-sdp2-OEL64-x86-4 ~]$ mdvop_server status
```

```
RmiRegistry (pid 3232) is running...
ASPService (pid 3250) is running...
SnmpService (pid 3289) is running...
MDVOPServer (pid 3322) is running...
[sdp2admin@dr-sdp2-OEL64-x86-4 ~]$
```

6

Starting VOP

This chapter describes how to start VOP applications.

> **Note:** Single-drive VOP applications may be started within MD-VOP, or separately as standalone applications.

Starting MD-VOP

This section describes how to start MD-VOP in both Windows and UNIX environments.

Starting MD-VOP (Windows)

To start MD-VOP, do one of the following:

- Click the Windows **Start** menu and select **All Programs**, **Multi-Drive VOP**, and then **Multi Drive VOP**.

- Double-click the **Multi-Drive VOP** desktop shortcut (optionally enabled during installation).

- Double-click the **Multi-Drive VOP** Quick Launch shortcut icon (optionally enabled during installation).

When you start MD-VOP, there is a minimal delay as the application starts. During loading, a progress bar appears. There may be an additional delay as VOP connects to tape drives and determines the current state of the tape drive(s).

Starting MD-VOP (UNIX)

To start MD-VOP, do one of the following:

- Run the file named **mdvop** from the installation directory. (Use a relative path, symbolic links, or add the VOP directory to your $PATH environmental variable.)

- Double click the **Multi-Drive VOP** desktop icon (if supported).

Launching MD-VOP for the First Time

When you launch MD-VOP for the first time, an MD-VOP Default screen displaying the Oracle logo appears.

> **Note:** This screen also appears if you have not defined an existing configuration as the default.

- To create a new standalone client MD-VOP configuration, click the **File** menu and select **Edit Configuration**.

  A default Configuration screen appears. See "Using the MD-VOP Configuration Screen" on page 8-3 for more information about creating a new configuration.

- To open an existing standalone client MD-VOP configuration, click the **File** menu and select **Launch Configuration**.

  The MD-VOP interface appears and the configuration opens. See Chapter 7, "Using the MD-VOP Interface" for more information.

- To create or update a new server configuration, click **MDVOP Server** and select **Edit Domain Configuration File on Server**. See "Edit Domain Configuration File on Server" on page 8-16 for more information.

- To create a client configuration, click the **File** menu and select **Create Client Configuration File from Server**. See "Create Client Configuration File from Server" on page 8-14.

Starting T10000 9840D VOP

You can start T10000 9840D VOP either from within the MD-VOP application, or from the desktop.

Starting T10000 9840D VOP within MD-VOP

To start T10000 9840D VOP within MD-VOP, click a drive to display the SDVOP view for that tape drive.

Starting T10000 9840D VOP from the Desktop

To start T10000 9840D VOP from the desktop, do the following:

> **Note:** A physical connection between your processing platform and the Ethernet port on the tape drive is assumed.

1. Double-click the **T10000 9840D VOP** desktop icon (if specified during installation). An Authentication dialog box appears.

2. Enter the IP address of the physically-connected tape drive, and click the **Connect** button. Otherwise, click **Cancel** to exit the application.

Starting LTO-VOP

You can start LTO VOP either from within the MD-VOP application, or from the desktop.

Starting LTO VOP within MD-VOP

To start LTO VOP within MD-VOP, click an LTO tape drive to display the SDVOP view for that tape drive.

Starting LTO VOP from the Desktop

To start LTO VOP from the desktop, do the following:

> **Note:**   A physical connection between your processing platform and
> the Ethernet port on the tape drive is assumed.

1. Double-click the **LTO VOP** desktop icon (if specified during installation). The LTO
    VOP interface appears.

    Because LTO VOP is not yet communicating with a tape drive, the Connect button
    is gray and all status indicators are black.

2. Enter the IP address of the tape drive Ethernet port in the field next to the Connect
    button.

3. Click the **Connect** button.

    Once connection is established, The IP address appears in the title bar, the status
    indicators are no longer black, and data appears in the Monitor Drive tab.

Starting 9XXX VOP

You can start 9XXX VOP either from within the MD-VOP application, or from the
desktop.

Starting 9XXX VOP within MD-VOP

To start 9XXX VOP within MD-VOP, click a tape drive to display the SDVOP view for
that tape drive.

Starting 9XXX VOP from the Desktop

To start 9XXX VOP from the desktop, do the following:

> **Note:**   A physical connection between your processing platform and
> the Ethernet port on the tape drive is assumed.

1. Double-click the **9XXX VOP** desktop icon (if specified during installation). The
    9XXX VOP interface appears.

2. Click the **File** Menu and select **Connect to Drive**. The Connect to Drive dialog box
    appears.

3. Enter the IP address of the physically-connected T9x40B or T9x40C tape drive, and
    click the **Connect** button. Otherwise, click **Cancel** to exit the dialog box.

7

Using the MD-VOP Interface

This chapter describes how to use the MD-VOP interface.

MD-VOP Interface Overview

Designed for ease of use, the MD-VOP Graphical User Interface (GUI) enables you to do the following:

- Navigate through multiple account configurations, including libraries and tape drives.

- Monitor, configure, and diagnose Oracle StorageTek tape drives.

- View the current state of all tape drives to monitor problems as they occur.

- Perform mass functions for multiple tape drives, including firmware updates, obtaining logs and dumps, and encryption.

- Create My Oracle Service (MOS) issues using the Auto Service Request (ASR) feature.

- Connect a VOP client to the VOP server.

- Configure the VOP server to enable automated alerts for selective products.

Figure 7–1 shows the MD-VOP main interface:

Figure 7–1   MD-VOP Main Interface
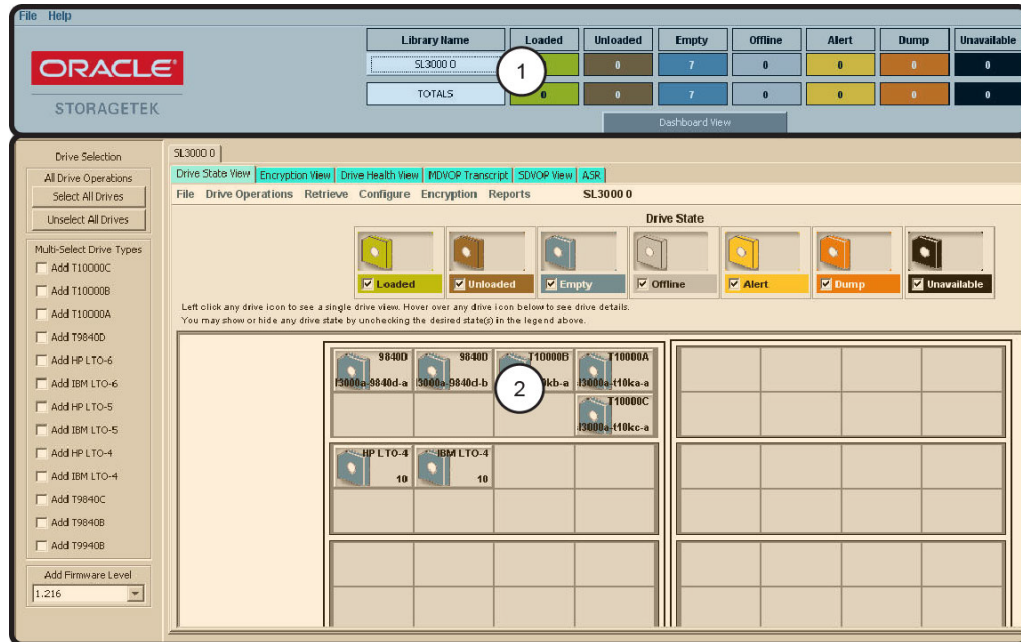
Legend:

1. Dashboard

2. Library Panel

As shown in Figure 7–1, The MD-VOP interface is divided into two sections:

- The Dashboard displays the general state of all tape drives in your configuration.

- The Library Panel displays information for tape drives in a selected library or VSM.

Both sections include menus you can use to perform various functions on selected tape drives.

Dashboard

The Dashboard displays the general state of all tape drives in your configuration. It displays the number of tape drives in each drive state, for both a selected library and the entire MD-VOP configuration.

> **Note:**   A tape drive can be in multiple states at a given time.

The dashboard includes menus you can use to create, launch, and save configurations, and perform other configuration tasks.

Figure 7–2 shows the MD-VOP dashboard:

Figure 7–2   MD-VOP Dashboard
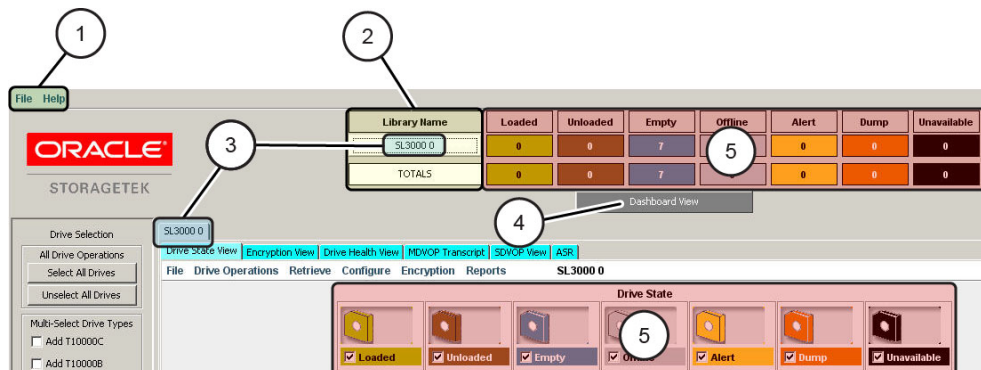
Legend:

1. Menus

2. Title

3. Library Name

4. View button

5. Drive State Counts

As shown in Figure 7–2, the Dashboard includes the following:

Menus

Use menus to create, update, or launch an MD-VOP configuration. See Chapter 8, "Using MD-VOP Dashboard Menus" for more information.

Title

The configuration name as defined on the MD-VOP Configuration screen.

Library Name

The library name that was created when the configuration was built. When you click a library name in the dashboard, the corresponding library tab is actively displayed in the library panel.

View Button

Click this button to toggle between the Dashboard view and Full view. In the Dashboard view, the Library Panel is hidden.

Drive State Counts

Displays the number of tape drives in each of the following drive states:

- Loaded

- Unloaded

- Empty

- Offline

- Alert

- Dump

- Unavailable

Separate counts are displayed for the selected library, and for all tape drives in the MD-VOP configuration.

> **Note:** A tape drive may be in multiple states at a given time.

See "Drive States" on page 7-10 for a description of these drive states.

Library Panel

The Library Panel displays information for tape drives in a selected library.

It includes menus you can use to control, update, and view selected tape drives within the library.

Figure 7–3 shows the MD-VOP Library Panel:

Figure 7–3   MD-VOP Library Panel
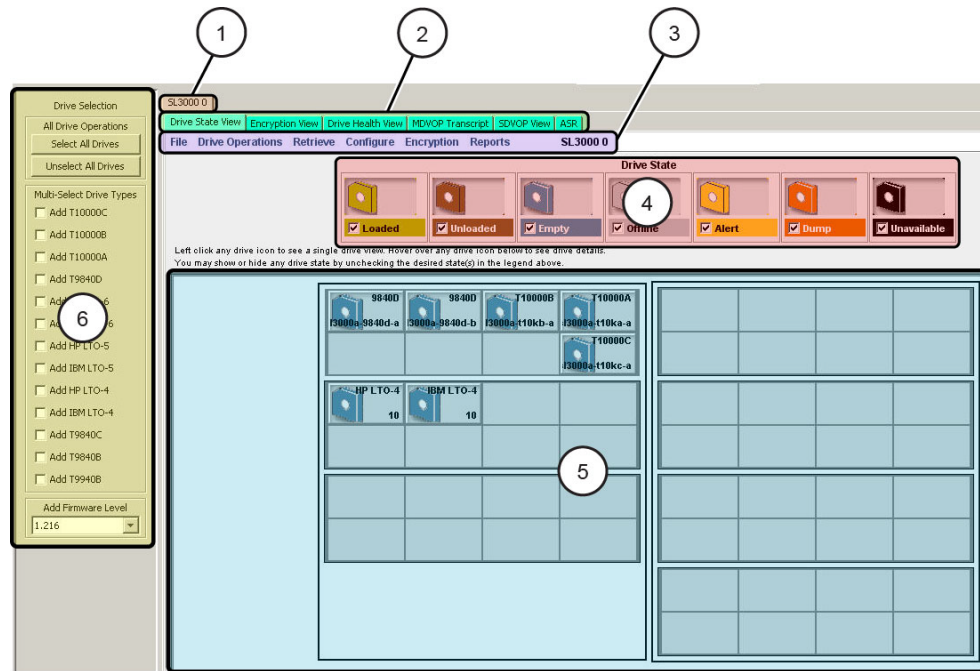
Legend:

1. Library/VSM tabs

2. Drive View tabs

3. Menus

4. Legend

5. Drive Details

6. Drive Selection Panel

As shown in Figure 7–3, the Library Panel includes the following:

Library/VSM Tabs

These tabs display library names. A separate tab is created for each library in your configuration.

- When you click a library tab, it becomes active, and the Library Panel displays tape drive information specific to that library.

- When you click the VSM tab in the Library Panel, the Library Panel displays VSM information for configured VSMs. See "VSM Tab" on page 7-7 for more information.

Drive View Tabs

These tabs display different types of tape drive information for the tape drives in the selected library.

When you click a tab, it becomes active, and the legend and Drive Details section display accordingly. See "Drive States" on page 7-10 for information about each drive state.

Menus

Use menu commands to manipulate or obtain data for one or more selected tape drives. See Chapter 9, "Using MD-VOP Library Panel Menus" for more information.

Note: If the SDVOP View tab is selected, these menus change to provide commands specific to the selected tape drive.

Legend

The legend provides a visual key for the information displayed in the Drive Details section of the Library Panel. The legend is based on the Drive View tab that is active.

Drive Details

The Drive Details section displays an icon for each tape drive in the selected library. These icons are color coded according to the legend.

You can perform the following functions:

- Click an individual tape drive icon to display the Single Drive Virtual Operator Panel (SDVOP) View for that tape drive. See "SDVOP View" on page 7-14 for information.

- Ctrl-click a tape drive icon to select or unselect the tape drive. Once you select a tape drive, you can issue Library Panel menu commands for that drive.

- Right-click a tape drive icon to display functions that can be performed on that tape drive.

    These are the same functions provided in the Library Panel's Drive Operations menu. See "Drive Operations Menu" on page 9-2 for a description of these functions.

- Mouse-over a tape drive icon to display the following information for that drive:

    – **Drive state**

        ONLINE or OFFLINE.

    – **Cartridge**

        LOADED or EJECTED.

    – **Dump**

AVAILABLE or NOT AVAILABLE.

– **Drive Name**

The tape drive name as defined in the MD-VOP Configuration screen.

– **Volser**

The volume serial number of a tape, if present and detected in the tape drive.

– **Serial Number**

The internal serial number of the tape drive.

– **Firmware Level**

The firmware currently loaded on the tape drive.

– **Port A WWN**

The World Wide Name for port A.

– **Port B WWN**

The World Wide Name for port B.

– **IP Address**

The IP address defined for the tape drive.

– **Host Name**

The host name, if detected from DNS.

– **Library Slot Location**

The physical slot location in the library.

– **Library Internal Location**

The physical location in the library as defined internally to the library (SL8500 and SL3000 only).

– **ACSLS/HLI Address**

The location that would appear in the ACS (SL8500 and SL3000 only).

– **Tray SN**

The serial number entered on the MD-VOP Configuration screen, used for support.

– **Licensed**

true or false, to indicate whether the tape drive is licensed for encryption.

– **Encryption Type**

The type of encryption used on this tape drive.

– **Encryption State**

Enrolled or Unenrolled, to indicate whether the tape drive can obtain keys from OKM.

– **Agent ID**

The OKM agent id.

– **KMS IP**

The OKM IP address.

Drive Selection Panel

Use the Drive Selection Panel to select multiple tape drives based on different criteria. This panel applies only to the library that is currently selected.

You can perform the following functions:

- Click the **Select All Drives** button to select all tape drives in the library.

- Click the **Unselect All Drives** button to unselect all tape drives in the library.

- Click the **Multi-Select Drive Types** check boxes to select specific drive types.

- Click the **Add Firmware Level** drop-down menu to select a specific level of tape drive firmware.

> **Note:** This can help you identify tape drives that are not at the appropriate firmware level.

VSM Tab

In server mode, if one or more VSMs are configured, a VSM tab appears in the Library Panel. When you click the VSM tab, the Library Panel displays VSM information for configured VSMs, as shown in Figure 7–4.

Figure 7–4   VSM Information

The following VSM information is displayed:

- VSM Name
- IP Address
- Product Name
- Serial Number
- Entitled Number
- Firmware

The ASR tab enables you to use the ASR feature. See "ASR" on page 7-15.

MD-VOP Drive Views

The MD-VOP Library Panel includes the following drive view tabs, used to display different types of information for tape drives in a selected library:

- "Drive State View" on page 7-9

■   "Encryption View" on page 7-10

■   "Drive Health View" on page 7-12

■   "MD-VOP Transcript" on page 7-14

■   "SDVOP View" on page 7-14

■   "ASR" on page 7-15

> **Note:**   By default, the Encryption view is not displayed, unless you
> indicated to include it when you installed MD-VOP. You can activate
> this view using the MD-VOP Default Settings screen. See "Changing
> MD-VOP Default Settings" on page 8-17 for more information.

Drive State View

From the MD-VOP Library Panel, select the **Drive State View** tab to display the
current state of the tape drives in the selected library. You may encounter a minimal
delay when this view is selected.

This view is only supported for the T9840D, T10000 series, and LTO 4/5 tape drives.
All other drives will display a white icon as an indicator of connection, for which other
logs can be obtained.

Figure 7–5 shows an example of the Drive State view:

Figure 7–5   Drive State View Example

Drive State View Legend

Figure 7–6 shows the legend displayed in the Drive State View:

Figure 7–6   Drive State View Legend

You can use the legend to filter the tape drives that are displayed in the Library Panel. Click the check box for a particular drive state to include or exclude applicable drives in the Library Panel.

Drive States By default, the legend includes the following drive states:

> **Note:**   You can customize icon labels and colors. See "Changing MD-VOP Default Settings" on page 8-17 for more information. Figure 7–6 shows the legend displayed after a first time installation.

Loaded

A tape cartridge is loaded and is ready to be used by the tape drive. This status is green by default.

Unloaded

A tape cartridge is unloaded. The tape cartridge resides in the tape drive, but is not actually threaded through the tape drive. This status is brown by default.

Empty

There is no tape cartridge in the tape drive. This status is blue by default.

Offline

The tape drive has been set to not allow some activity to the backup system. This state is used for maintenance to the tape drive. In this state, commands from the host (backup server) are not processed. This status is gray by default.

Alert

The tape drive is in need of cleaning due to periodic or error detection limits.

This status is yellow by default.

Dump

A dump can occur for a problem that falls outside of the limits in the firmware on the tape drive. This is an SNO (should not occur) in a memory dump from the tape drive. Send the dump to Support for analysis. This status is orange by default.

Unavailable

A tape drive is not communicating with MD-VOP. This status is black by default.

Encryption View

From the MD-VOP Library Panel, click the **Encryption View** tab to display the current encryption state of the tape drives in the selected library. You may encounter a minimal delay when this view is selected.

> **Note:** By default, the Encryption view is not displayed, unless you indicated to include it when you installed MD-VOP. You can activate this view using the MD-VOP Default Settings screen. See "Changing MD-VOP Default Settings" on page 8-17 for more information.

Only T9840D, T10000 series, and encrypting LTO tape drives support encryption through an Oracle Key Manager (OKM) system.

Figure 7–7 shows an example of the Encryption view:

Figure 7–7   Encryption View Example
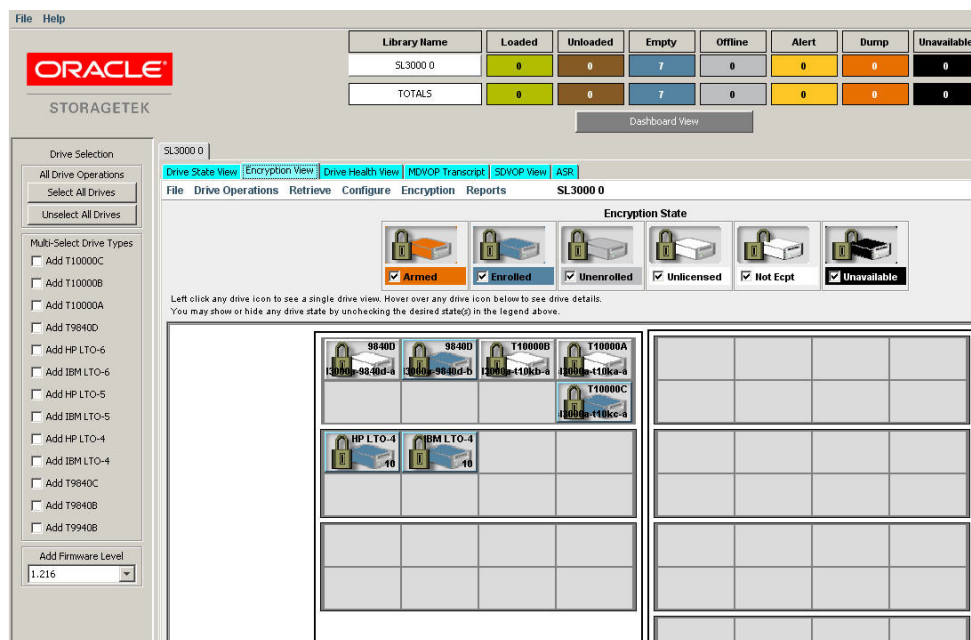
Encryption View Legend

Figure 7–8 shows the legend displayed in the Encryption View:

Figure 7–8   Encryption View Legend

You can use the legend to filter the tape drives that are displayed in the Library Panel. Click the check box for a particular drive state to include or exclude applicable tape drives in the Library Panel.

Encryption States   By default, the legend includes the following encryption states:

> **Note:** You can customize icon labels and colors. See "Changing MD-VOP Default Settings" on page 8-17 for more information.

Armed

The tape drive has acquired an encryption key from OKM. The tape drive can write encrypted data. This status is green by default.

Enrolled

The tape drive is enrolled with OKM but does not have an encryption key from OKM. This status is blue by default.

Unenrolled

The tape drive has been reset and is no longer enrolled with OKM. The tape drive cannot write encrypted data. This status is gray by default.

Unlicensed

The tape drive is capable of encryption, but the license key for the tape drive has not been sent to the tape drive. This status is white by default.

Not ecpt

The tape drive is not capable of encryption. This status is white by default.

Unavailable

The tape drive is not communicating with MD-VOP. This status is black by default.

Drive Health View

From the MD-VOP Library Panel, click the **Drive Health View** tab to display the current health status of the tape drives within the selected library. You may encounter a minimal delay when this view is selected.

> **Note:** At MD-VOP startup, the "good" state color is indicated by default. This remains until you issue a Perform Health Check command from the Library Panel Drive Operations menu. See "Drive Operations Menu" on page 9-2 for more information.

Figure 7–9 shows an example of the Drive Health view:

Figure 7–9   Drive Health View Example

Drive Health View Legend

Figure 7–10 shows the legend displayed in the Drive Health view:

Figure 7–10   Drive Health View Legend

You can use the legend to filter the tape drives that are displayed in the Library Panel. click the check box for a particular drive state to include or exclude applicable tape drives in the Library Panel.

Drive Health States   By default, the legend includes the following drive health states:

> **Note:**   You can customize icon labels and colors. See "Changing MD-VOP Default Settings" on page 8-17 for more information.

Normal

No events are found on the tape drive. This status is green by default.

Warning

The tape drive has a concern that requires review. This status is yellow by default.

Alert

The tape drive requires attention. This status is also triggered when the tape drive is unavailable for connection. This status is red by default.

MD-VOP Transcript

From the MD-VOP Library Panel, click the **MD-VOP Transcript** tab to display all global commands sent or received from the tape drives in the selected library.

> **Note:** You may encounter a minimal delay when this view is selected.

MD-VOP transcripts are stored in the transcripts subdirectory within the MD-VOP application folder. Figure 7–11 shows an example of the MD-VOP Transcript view:

Figure 7–11   MD-VOP Transcript View Example

SDVOP View

Click a tape drive icon in the Library Panel to access the SDVOP (single-drive) View for that tape drive. The SDVOP View tab becomes active.

- If you click a T9840D or T10000 tape drive, the T10000 9840D SDVOP interface is displayed in the MD-VOP Library Panel. See Chapter 10, "Using T10000 9840D VOP" for information about using T10000 9840 VOP.

- If you click an LTO tape drive, the LTO VOP interface is displayed in the MD-VOP Library Panel. See Chapter 11, "Using LTO VOP" for information about using LTO VOP.

- If you click a T9840B, T9840C, T9940A, or T9940B tape drive, the 9XXX VOP interface is displayed in the MD-VOP Library Panel. See Chapter 12, "Using 9XXX VOP" for information about using 9XXX VOP.

Figure 7–12 shows an example of the SDVOP view for a T10000 tape drive:

Figure 7–12   SDVOP View Example
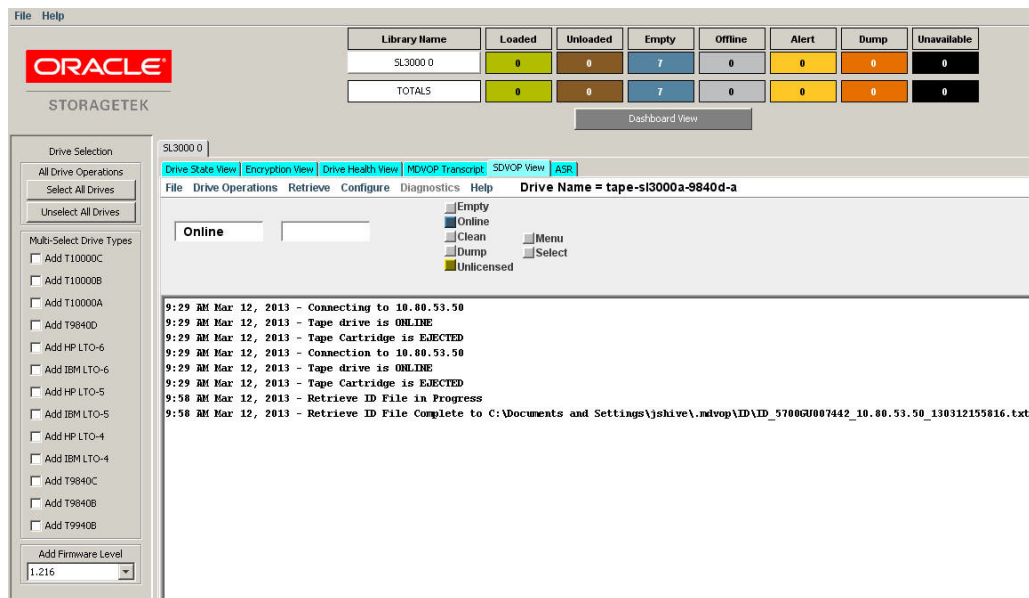
As shown in Figure 7–12, the SDVOP View is active, and the T10000 9840D VOP interface is displayed in the MD-VOP Library Panel.

ASR

From the MD-VOP Library Panel, click the **ASR** tab to display the ASR view.

> **Note:**   You may encounter a minimal delay when this view is selected.

The following sections describe how to establish ASR functionality and configure devices for use with ASR.

Establishing ASR Functionality for a Device

Under the client/standalone VOP:

1. Register the application. See "ASR Register" on page 7-17.

2. Configure one or more devices to VOP and enter serial numbers where appropriate.

3. Activate the assets. See "ASR Activate" on page 7-18.

4. Access My Oracle Support (MOS) and confirm that the assets are activated.

   For more information, visit the following URL:

   http://www.oracle.com/technetwork/systems/asr/documentation/index.html

5. Optionally, send a test message or simulate an event.

To enable the automatic ASR feature included in the VOP server:

- For libraries, click the SNMP button on the Domain Configuration page. See "Edit Domain Configuration File on Server" on page 8-16.

- For VSM, click the Domain Configuration page. This automatically configures the VSM and server. See "Edit Domain Configuration File on Server" on page 8-16.

- For T10000 tape drives:

  1. Access the MDVOP single drive view for the drive and place the drive offline. See "SDVOP View" on page 7-14.

  2. Access the data from the drive and select the SNMP tab.

  3. Enter the IP address for the server and select Save. The drive reboots.

  For a 9xxx tape drive, use the edit MIM to configure the device. You can configure a single device or multiple devices. If you are configuring a single device, go to the single drive view. See SDVIEW.

  1. Place the tape drive offline.

  2. Under Configuration, select MIM. The MIM File Configuration screen appears:

Figure 7–13   Mim File Configuration screen

  3. Enter the Host IP address for the server (use the port that the tape drives is attached to). Then click **OK**.

Note: Only use the Advanced Settings tab as directed by Oracle support.

Figure 7–14 shows an example of the MD-VOP ASR view:

Figure 7–14   ASR View Example

As shown in Figure 7–14, the ASR view includes the following tabs:

■   ASR Register

■   ASR Activate

■   ASR Creation

■   ASR Log

■   ASR Test

By default, the ASR Activate page is selected when you click the **ASR** tab.

Before you can create a service request, you must first register with MOS (using the ASR Register tab) and activate your devices (using ASR Activate tab).

ASR Register

To use the ASR feature, you must first register with the My Oracle Support (MOS) to confirm that this is a valid application capable of sending data. This step establishes an unique key so that all additional traffic can be matched to a product.

To register:

1. In the Enter valid Oracle MOS account field, enter your My Oracle Support (MOS) username and password.

2. Enter ASR Manager internet settings. The ASR Manager is a system that centrally accepts hardware telemetry data sent from a group of ASR Assets. The ASR Manager filters the incoming data and forwards potential fault telemetry to Oracle ASR back-end systems.

3. Optionally, if you are accessing the internet through a proxy, click the **Enable Proxy Configuration** check box and provide the following:

   –   Proxy server host name

   –   Proxy port number

– Proxy user name

– Proxy password

– NTLM Domain Name (if applicable)

– NTLM Host Name (if applicable)

> **Note:** If you access the internet through a proxy, check with your network administrator to collect information needed to configure the ASR Manager system.

4. Click the **Submit** button to register with the supplied information, or click the **Clear** button to cancel the operation.

ASR Activate

Click this tab to display the ASR Activate page. Use this page to activate one or more tape drives. to create an ASR for a particular tape drive, you must first activate the tape drive. By default, libraries are automatically added to the activate list.

To activate a tape drive, select it from the **Available Devices** window and drag and drop it in the **Selected/Activated Devices** window.

Devices are listed with the following information:

- drive type

- internal serial number

- tray serial number

- entitled status

> **Note:** An asterisk indicates a device that has already been activated.

After you activate one or more tape drives, the Account Manager must enable these ASR Assets in My Oracle Support. Otherwise, any alerts you attempt to send will be dropped. Refer to the *Oracle Auto Service Request Installation and Operations Guide* for instructions. A valid service contract is required.

ASR Creation

Click this tab to display the ASR Creation page. Use this page to create a MOS Service Request, or Case, for one or more tape drives.

> **Note:** Before you can create a service request, you must first register with MOS (using the ASR Register tab) and activate your devices (using the ASR Activate tab).

To create a Service Request:

1. Click the drop-down menu and select an activated tape drive for which to create a MOS Service Request.

2. Select additional devices for the Service Request. Drag and drop devices from the **Available Devices** window to the **Selected drives** window.

3. Enter any additional information to be included in the Service Request.

4. Click the **Create ASR** button to create the Service Request in MOS, or click the **Clear** button to cancel the operation.

Once the Service Request is created in MOS, logs are automatically collected, transmitted to the Oracle ASR back-end system, and attached to the Service Request.

ASR Log

Click this tab to view a running log of ASR activity. Logs are not produced for LTO drives.

ASR Test

Click this tab to test end-to-end communications between a tape drive and the Oracle ASR back-end system.

Note: Before you can test communications, you must first register with MOS (ASR Register tab) and activate your devices (ASR Activate tab).

To test communications:

1. Click the drop-down menu and select an activated tape drive.

2. Click the **Test** button.

When the test completes, the user registered under MOS receives a confirmation e-mail indicating whether the test was successful. If the test fails, the e-mail includes possible causes.

8

Using MD-VOP Dashboard Menus

This chapter describes how to use the MD-VOP Dashboard menus.

Use MD-VOP Dashboard menu commands to create or edit an MD-VOP configuration, and to specify application settings. A configuration applies to the libraries and tape drives that are to be displayed in the Drive Details section of the Library Panel.

The Dashboard includes a File Menu and Help Menu.

File Menu

The File menu includes the following commands:

Launch Configuration

Displays a pop-up window you can use to open a previously saved local configuration. This only applies in standalone mode, with a direct connection to the device.

Edit Configuration

Displays the Configuration screen, used to create a new configuration or edit and existing configuration. See "Using the MD-VOP Configuration Screen" on page 8-3 for more information.

MDVOP Server

Displays a submenu of options used to configure the MDVOP server component. See "Using the MDVOP Server Menu Options" on page 8-14 for more information.

Set as Default Configuration File

Sets the current configuration as the default. This configuration is automatically loaded the next time you start MD-VOP.

Edit Library Probe Configuration

Displays the Library Probe Configuration dialog box, used to set defaults for establishing communication with a tape library. These defaults are applied on the Configuration screen when you enter the IP address for an SL500, SL3000, or SL8500 library.

Enter the following default library probe settings:

- Default User

    The account used to connect to a library. Enter an account or select one of the following from the drop-down menu:

- **admin** - The general administration account provided to you.

- **remote** - Remote user for libraries.

- **acsss** - Placeholder for future ACSLS functionality.

- **oem** - An OEM account from a partner. Also used for libraries.

- Default Password

  The password for the default account. Once you connect to a library, you can change the password to be specific to that library.

- Unknown Host Authorization

  Applies when using SSH for communication. Library credentials can be displayed for you to accept or decline.

  Select one of the following from the drop-down menu:

  - **Auto** - SSH credentials are not displayed, and are automatically accepted.

  - **Prompt** - SSH credentials are displayed and you are prompted to accept or decline.

- Connection Timeout

  The timeout value, in seconds, for the connection within SSH while establishing a connection to the library.

- Process Execution Timeout

  The timeout value, in seconds, for an individual command being sent.

MDVOP Default Settings

Displays the Default Settings screen, used to edit MD-VOP display settings. See "Changing MD-VOP Default Settings" on page 8-17 for more information.

Get MDVOP Logs for Support

Collects all MD-VOP logs and saves them in a zip file at the specified location.

Launch

Launches an existing configuration. The five most recent configurations are listed.

Exit

Exits the MD-VOP application.

> **Note:** You can also click the "X" icon in the upper right corner of the window to exit the MD-VOP application.

Help Menu

The Help menu includes the following commands:

Contact Support

Displays a warranty statement and information about contacting Oracle to obtain MD-VOP support.

About

Displays the following information about the MD-VOP application and environment:

- Role level access

- MD-VOP Version
- MD-VOP Build Date
- VOP Version
- VOP Build Date
- Java Version
- License Agreement

Using the MD-VOP Configuration Screen

From the Dashboard, click the **File** menu and select **Edit Configuration** to access the Configuration screen.

Use this screen to create a new MD-VOP configuration, or edit an existing MD-VOP configuration. You can also use this screen to find a tape drive, probe a range of IP addresses, or change the IP address of a tape drive.

Figure 8–1 shows the Configuration screen:

Figure 8–1   MD-VOP Configuration Screen
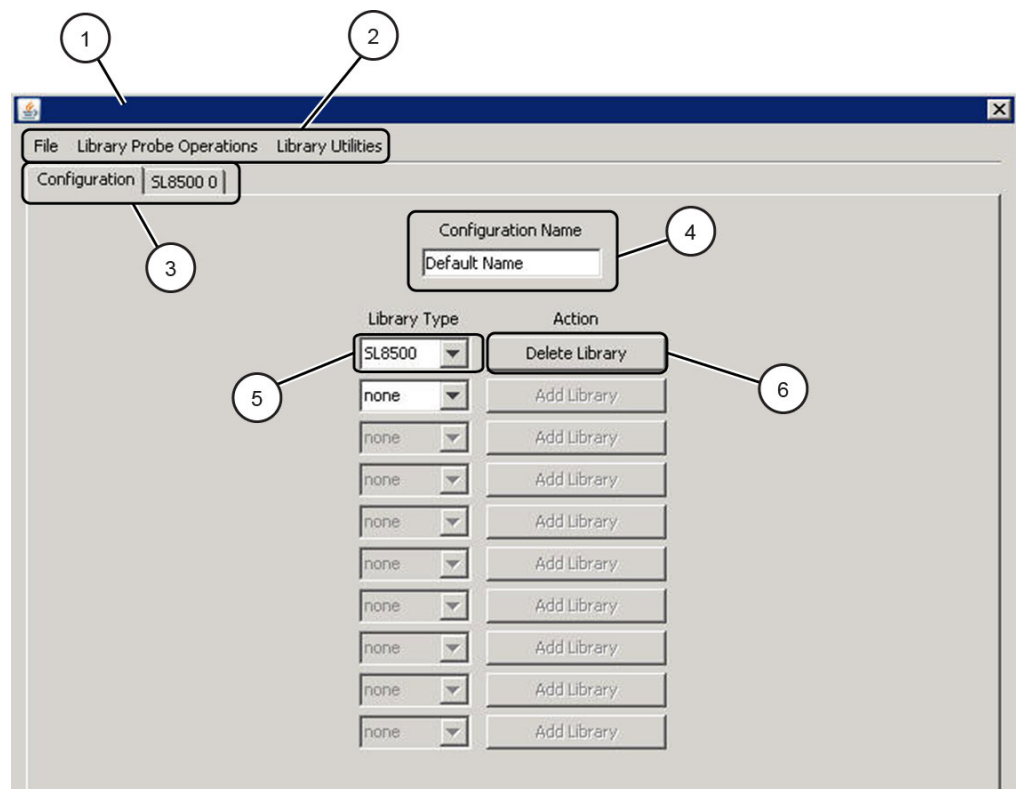
Legend:

1. Title

2. Menus

3. Tabs

4. Configuration Name

5. Library Type

6. Action

As shown in Figure 8–1, the Configuration screen includes the following:

Title

The file name used to create this configuration.

Menus

Use menus to issue MD-VOP configuration commands. See "Configuration Menus" on page 8-7 for more information.

Tabs

A Configuration tab is displayed, along with additional tabs for each library you add. click a library tab to display its Library Spreadsheet page, where you can define detailed settings for the library. See "Library Spreadsheet Page" on page 8-4 for more information.

Configuration Name

The configuration name as displayed on the MD-VOP dashboard.

When you create a new MD-VOP configuration, Default Name is displayed. Overwrite this value with your new configuration name.

Library Type drop-down menu

Click this drop-down menu to select a library type to be added or deleted. This selection defines the possible types of slots available.

Action

Click this button to add or remove a library from the MD-VOP configuration.

- When you add a library, a new tab is created, and the Library Spreadsheet page for the new library is displayed. Use this page to define your library settings. See "Library Spreadsheet Page" on page 8-4 for more information.

- When you delete a library, all entries for that library are removed.

Library Spreadsheet Page

To display the Library Spreadsheet page for a particular library, click the appropriate library tab from the MD-VOP Configuration screen. Use the Library Spreadsheet page to define or view detailed library settings.

Figure 8–2 shows an example of the Library Spreadsheet page.

Figure 8–2   Library Spreadsheet Page

Legend:

1. Library Settings

2. Tape Drive Settings

3. Drive Definition Spreadsheet

As shown in Figure 8–2, the Library Spreadsheet page is divided into three sections:

- "Library Settings" on page 8-5
- "Tape Drive Settings" on page 8-6
- "Drive Definition Spreadsheet" on page 8-6

Library Settings

The Library Spreadsheet page includes the following library settings:

Lib Name

Specify the library name. This is used as the user-defined library name.

Number of Drive Bays (SL3000 only)

Specify the number of optional tape drive modules.

IP Address

Specify the IP address for the library.

Lib SN

Specify the serial number for the library.

Click the **Probe** button to perform a probe based on the specified settings. Once the probe completes, the Library Spreadsheet is automatically populated with the results of the probe.

Tape Drive Settings

The Library Spreadsheet page includes the following tape drive settings:

IP Address Preamble

Optionally, enter the first three fields of the tape drive IP address. This will be used as the preamble for the IP specification in the second column of the Drive Definition spreadsheet. This preamble will be appended to that specification to form the complete IP address.

Auto-fill Drive Name

Use these options to automatically populate the Drive Name column of the Drive Definition spreadsheet:

- **Off**

  Do not attempt to automatically populate the Drive Name column.

- **IP Address**

  Use the IP address as the default name in the Drive Name column.

- **Slot Number**

  Use the slot location as the default name in the Drive Name column.

- **DNS Node Name**

  Use the DNS entry for the IP address (if detected) as the default name in the Drive Name column.

Auto-probe for drives

Direct MD-VOP to probe for drive type and serial number when you enter an IP address on the Drive Definition spreadsheet. Click **ON** to enable this feature. Click **OFF** to disable this feature.

Drive Definition Spreadsheet

The Drive Definition spreadsheet includes six columns:

1. **Slot number**

   The library slot in which the tape drive is located.

2. **IP Address**

   The IP address of the tape drive.

3. **Drive Name**

   Human readable name of the tape drive. This field can be user entered.

4. **Drive Type (special)**

The model of the tape drive in this slot. The value of this field determines which connection protocol and single-drive VOP style to use when connecting to this tape drive:

- Telnet

  T10000 family, T9840D. Detected by probe operation.

- LTO

  Ethernet-enabled encryption HP and IBM LTO4/5. Detected by probe operation.

- FTP

  T9840B/C, T9940B. Detected by probe operation.

- Placeholder

  Indicates that a non-Ethernet connected tape drive is in this library location. For example, LTO2, LTO3. This field must be manually entered.

5. **DMOD S/N**

The serial number for the tape drive in this library slot.

6. **Tray S/N**

The serial number of the tray for the tape drive in this library slot.

Populating the Drive Definition Spreadsheet The drive definition spreadsheet must include a populated row for each tape drive in the library. To populate the spreadsheet, do one of the following:

- Specify library settings and click the **Probe** button.

- If you enable the Auto-probe for drives option, you can enter an IP address in the spreadsheet and allow MD-VOP to probe for the drive. Once the drive is detected, the remaining columns are automatically populated.

- Use configuration menu commands to select a range and probe for multiple IP addresses. Once IP addresses are detected, the spreadsheet columns are automatically populated.

  See "Using Probe Commands" on page 8-9 for more information.

When you are finished entering tape drives on the spreadsheet, click the next empty row in the spreadsheet to signal to MD-VOP that the last row is complete. Then click the **File** menu and select **Save** to save your configuration.

Configuration Menus

The following configuration menus are displayed at the top of the Configuration screen:

- "File Menu" on page 8-7

- "Library Probe Operations Menu" on page 8-8

- "Library Utilities Menu" on page 8-9

File Menu

The File menu includes the following commands:

Open Configuration

Opens an existing configuration.

New Configuration

Creates a new, "empty" configuration with no libraries or tape drives. The current configuration is not affected.

Save

Saves the configuration.

Save as

Saves the configuration with a specified name.

Delete Configuration File

Deletes the configuration.

Set as Default Configuration

Sets the current configuration as the default configuration that is loaded when you start MD-VOP.

Unset Default Configuration

Clears the default configuration setting.

Launch

Launches an existing configuration. The five most recent configurations are listed.

Exit Configuration Dialog

Exits the Configuration screen.

Library Probe Operations Menu

Use the Library Probe Operations menu to populate tape drive information in the active library spreadsheet page.

This menu includes the following commands:

Probe IP Addresses in Spreadsheet

If an IP address is present in column 1, probe for a valid device.

> **Note:** The auto probe routine (enabled by default) performs the same function. For valid IP addresses, the Drive Type and Drive Serial Numbers will be automatically populated. See "Tape Drive Settings" on page 8-6 for more information about the Auto-probe for drives routine.

Probe IP Range for Drives

Probes tape drives for a single library, based on an IP range. See "Probing an IP Range for Drives" on page 8-11.

Probe Library for Drives

Probes a library based on the specified library IP address and automatically populates the drive information in the Library Spreadsheet.

Probe Complex (SL8500 Only)

Use the Library Probe Operations menu to direct MD-VOP to probe for a collection of SL8500 libraries connected with pass-through ports.

MD-VOP creates the libraries that can be detected from information reported by tape drives, and inserts the tape drives in the appropriate library.

This option is only valid for T10000 tape drives. These tape drives must be at appropriate firmware levels. See "MD-VOP Tape Drive Support" on page 3-3 for more information.

> **Note:** This option is recommended only for new, "empty" configurations. Using this option with an existing configuration can result in mismatches and duplicate information.

See "Probing a Complex" on page 8-10 for information about performing the probe.

Library Utilities Menu

This menu includes the following commands:

Clear Spreadsheet

Clears all entries in the current drive definition spreadsheet. All entries are stored until you save the configuration.

Reset Probe Settings for this Library

Clears all entries in the current drive definition spreadsheet. All entries are stored until you save the configuration.

Retrieve Library SN

Clears all entries in the current drive definition spreadsheet. All entries are stored until you save the configuration.

Scan Tray Serial Numbers

Enables you to enter a serial number for a selected slot. This serial number is used when requesting support. It is included in reports, and in the information displayed when you mouse-over a tape drive.

This command loops through each tape drive present and requests that the tray serial number be added to the drive definition spreadsheet. For each slot, enter the serial number and press the OK button.

> **Note:** You can also manually add these serial numbers to the drive definition spreadsheet.

Using Probe Commands

MD-VOP includes Probe commands designed to help you build an MD-VOP configuration. These commands probe for libraries and tape drives, and then create and populate the corresponding library spreadsheet pages.

Access these commands from the Library Probe Operations menu on the MD-VOP Configuration screen.

Probing a Complex

Use the Library Probe Operations menu to direct MD-VOP to probe for a collection of SL8500 libraries connected with pass-through ports. MD-VOP creates the libraries that can be detected from information reported by tape drives, and inserts the tape drives in the appropriate library.

This option is only valid for T10000 tape drives. These tape drives must be at appropriate firmware levels.

Additionally, this option is recommended only for new, "empty" configurations. Using this option with an existing configuration can result in mismatches and duplicate information.

To probe an SL8500 library complex:

1. Click the **Library Probe Operations** menu and select **Probe Complex (SL8500 Only)**. A pop-up window appears:

Figure 8–3   Probe Complex for Libraries and Drive Location Dialog
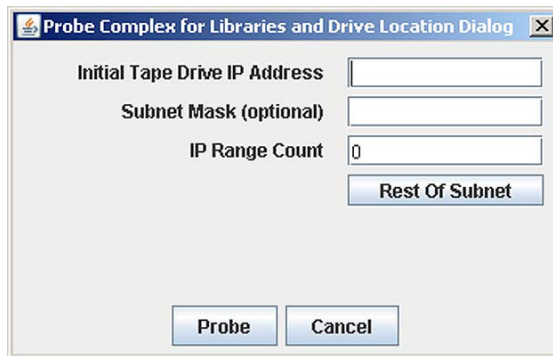
2. Enter the Initial Tape Drive IP Address. Optionally, you may include the number of bits in the subnet mask. For example, 172.18.18.1/23.

3. Optionally, enter the number of bits in the subnet mask. This is an alternative to the method described in the previous step.

4. Enter the IP range count to scan from the base address. Click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.

5. Click the **Probe** button.

    A status window appears as MD-VOP begins to probe each IP address in the specified range to locate any tape drives. During this process, MD-VOP scans the IP range, creates libraries, and places detected tape drives into the correct library and slot location.

    If you want to cancel this operation, click the **Abort Probe** button at any time.

6. When the probe completes, an informational window appears, indicating the number of tape drives that were located and placed and the number of tape drives that were unable to be placed.

    > **Note:**   You can manually enter the unsuccessful tape drives.

7. Click **OK**. MD-VOP creates a new tab in the Library Panel for each library detected. In addition, the drive definition spreadsheet for each library is automatically populated with the valid tape drive information.

Probing an IP Range for Drives

Use the Library Probe Operations menu to direct MD-VOP to probe for tape drive IP addresses within a selected library.

Click **Library Probe Operations** and select **Probe IP Range for Drives**. The following pop-up window appears:

Figure 8–4   Probe for Drive Location Dialog

This window includes options used to select one of the following probing methods:

- Detect and Place Drive Manually

  MD-VOP probes for tape drives and enables you to place them manually.

- Place by Drive Library Location SL3000 and SL8500)

  MD-VOP probes for tape drives and places them in the appropriate slots.

- Sequential IP Drive Placement

  MD-VOP probes for tape drives and places them sequentially by slot.

The following sections describe these methods.

Detect and Place Drive Manually To perform the probe:

1. Click **Library Probe Operations** and select **Probe IP Range for Drives**. The Probe for Drive Location dialog box appears.

2. Click **Detect and Place Drive Manually** option.

3. In the Initial Tape Drive IP Address field, enter the starting IP address.

4. In the IP Range Count field, specify an IP Range Count or click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.

5. Click the **Probe** button. MD-VOP scans the library and then the following screen appears:

Figure 8–5   Manual Drive Placement Screen
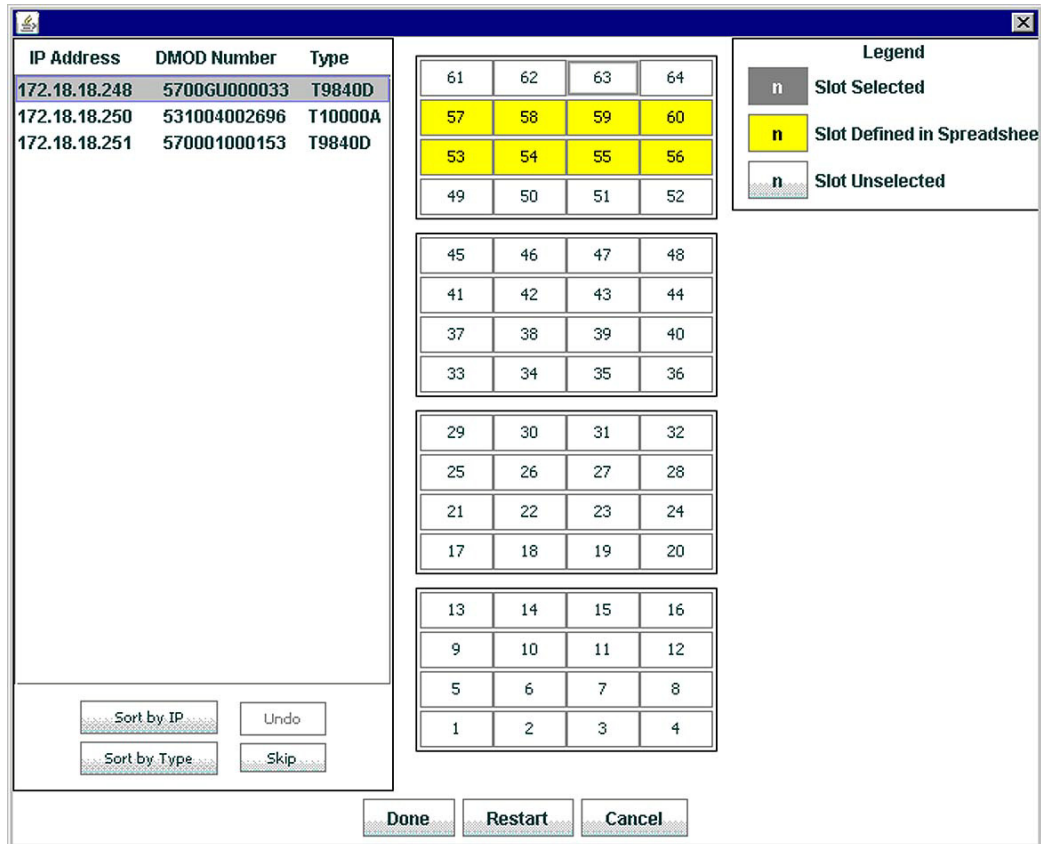
As shown in Figure 8–5, detected tape drives are listed on the left. Library slots are shown on the right.

You can use the following buttons to sort the list of detected tape drives:

- Sort by IP

  Sort the list of tape drives by IP address.

- Sort by Type

  Sort the list of tape drives by drive type.

- Undo

  Undo the last tape drive placement operation, returning the tape drive to the list of detected tape drives.

- Skip

  Skip the tape drive at the top of the detected drives list.

6. Click a slot to assign the first tape drive to the library.

7. Repeat Step 6 for the remaining tape drives in the list.

8. When you are finished, click **Done**. Otherwise, click **Restart** to clear your changes, or click **Cancel** to exit the operation.

When you click **Done**, the drive information is added to the drive definition spreadsheet.

Place by Drive Library Location (SL3000 and SL8500) To perform the probe:

1. Click **Library Probe Operations** and select **Probe IP Range for Drives**. The Probe for Drive Location dialog box appears.

2. Click the option for **Place by Drive Location (SL3000 and SL8500)**.

3. In the Initial Tape Drive IP Address field, enter the starting IP address.

4. In the IP Range Count field, specify an IP Range Count or click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.

5. Click the **Probe** button. A progress window appears as MD-VOP begins to probe each IP address in the specified range to locate any tape drives. If you want to cancel this operation, click the **Abort Probe** button at any time.

6. When the probe completes, an informational window appears, indicating the number of tape drives that were located and placed and the number of tape drives that were unable to be placed. You have the option to manually enter the unsuccessful tape drives.

7. Click **OK**.

**Sequential IP Drive Placement** To perform the probe:

1. Click **Library Probe Operations** and select **Probe IP Range for Drives**. The Probe for Drive Location dialog box appears.

2. Click the option for **Sequential IP Drive Placement**.

3. In the Initial Tape Drive IP Address field, enter the starting IP address.

4. In the IP Range Count field, specify an IP Range Count or click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.

5. Click the option for **Sequential IP Drive Placement**.

6. In the First Library Slot to Use field, enter the library slot number where counting is to begin.

7. Click the **Probe** button. A progress window appears as MD-VOP begins to probe each IP address in the specified range to locate any tape drives. Sequential IP addresses are placed starting at the slot you specified in Step 6. If you want to cancel this operation, click the **Abort Probe** button at any time.

8. When the probe completes, an informational window appears, indicating the number of tape drives that were located and placed and the number of tape drives that were unable to be placed. You have the option to manually enter the unsuccessful tape drives.

9. Click **OK**.

Library Probe This routine enables you to detect devices from the library with a direct connection. Clicking the probe button does the same thing. This uses the library IP address that was entered.

To perform the probe:

1. Click **Library Probe Operations** and select **Probe IP Range for Drives**. The Probe for Drive Location dialog box appears.

2. Click the option for **Library Probe**.

   The following dialog appears:

Figure 8–6   Edit Probe Configuration
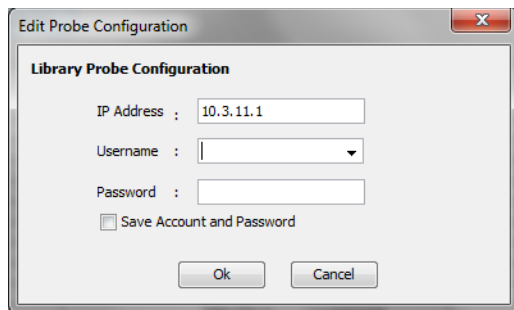
3. Enter your username and password and then click **OK**.

   This routine may require several minutes to complete.

Using the MDVOP Server Menu Options

From the MD-VOP Dashboard, click the File menu and select MDVOP Server to display the MDVOP Server menu. This menu includes the following options:

- Connect to Server
- Create Client Configuration File from Server
- Edit Domain Configuration File on Server
- Delete Client Configuration File on Server
- Launch Client Configuration

Connect to Server

Use this option to connect MDVOP to an MDVOP server.

1. From the MDVOP Server menu, select Connect to Server.

   A Server Name dialog appears.

2. Enter the IP address for the MDVOP server and click OK.

   MDVOP connects to the server.

Create Client Configuration File from Server

Use this option to create a new client configuration from an existing configuration on the MDVOP server.

1. From the MDVOP Server menu, select Create Client Configuration File from Server.

   A Server Name dialog appears.

2. Enter the IP address for the MDVOP server from which you will select an existing configuration file.

   A Remote File Chooser dialog appears, listing all available configuration files.

3. Select the desired configuration file and click OK.

   The configuration file opens and you can save it as a new configuration file.

Edit Client Configuration File on Server

Use this option to edit a client configuration file on the MDVOP server.

1. From the MDVOP Server menu, select Edit Client Configuration File on Server.

   A Remote File Chooser dialog appears, listing all available configuration files.

2. Select the configuration you want to edit and click OK.

   The configuration page for the configuration you selected appears. As shown in Figure 8–7, this window includes a Configuration tab along with separate tabs for each library.

Figure 8–7   Client Configuration Page

3. Do one of the following:

   ■ Click the Configuration tab to display the configuration page. You can click the Delete library button to delete a library.

   ■ Click a library tab to display the library page, listing all drives included in the library. You can click the "X" (delete) button next to a drive to delete it.

4. When you are finished with your edits, click the File menu and select Save to save the configuration. All changes are saved on the server side, and also locally.

Edit Domain Configuration File on Server

Use this option to edit the domain configuration file (domain.vop), located on the server. This file defines which devices are monitored by the server. Only the services on the server use this file. The client uses a copy of this file called a client configuration.

1. From the MDVOP Server menu, select Edit Domain Configuration File on Server.

   The domain.vop configuration page appears. As shown in Figure 8–8, this page includes a Configuration tab along with separate tabs for each library and VSM.

Figure 8–8   Domain.vop Configuration Page

2. Do one of the following:

   - Click the Configuration tab to display the configuration page. You can use this page to add or delete a library. Click the appropriate button.

   - Click a library tab to display the library page, listing all drives included in the library. You can do the following:.

     – Edit the library name.

     – Edit the IP address.

     – Edit the serial number.

     – Edit the ACS setting.

     – Delete a drive. Click the "X" (delete) button next to a drive to delete it.

     – Click the SNMP option to display the SNMP Configuration screen. Use this screen to enable SNMP for the selected library. This is required for ASR support, to allow communication from the device to the VOP server.

Enter the IP address of the port that the library is attached to on the server, select **Enable SNMP for this library** and click **OK**. The server will begin listening for these libraries.

■ Click a VSM tab to display the VSM page, used to discover the VSM.

Enter a VSM name and IP address and click Discover. Once the VSM is discovered, the VSM Information fields are automatically populated and the VSM is automatically configured.

3. When you are finished with your edits, click the File menu and select Save to save the configuration.

4. Restart server services.

Delete Client Configuration File on Server

Use this option to delete a client configuration file on the server.

1. From the MDVOP Server menu, select Delete Client Configuration File on Server.

A File Chooser dialog appears, listing all client configuration files.

2. Select the configuration file you want to delete and click OK.

The configuration is deleted.

Launch Client Configuration
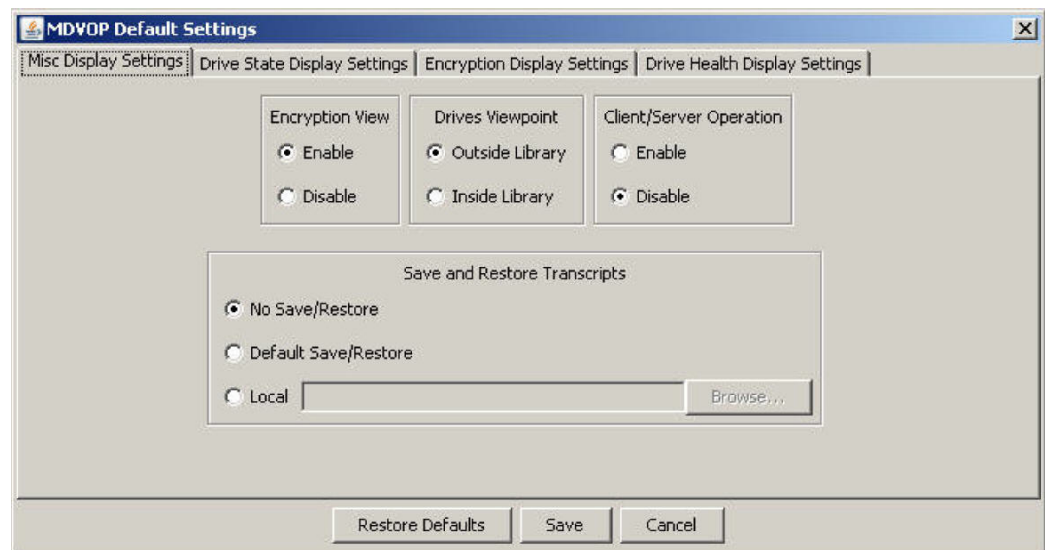
Use this option to launch an existing client configuration.

Changing MD-VOP Default Settings

From the MD-VOP Dashboard, click the **File** menu and select **Default Settings** to access the Default Settings screen. Use this screen to change the default MD-VOP display settings.

Figure 8–9 shows the MD-VOP Default Settings screen:

Figure 8–9 MD-VOP Default Settings Screen

As shown in Figure 8–9, this screen includes the following tabs:

- "Misc Display Settings" on page 8-18
- "Drive State Display Settings" on page 8-18
- "Encryption Display Settings" on page 8-20
- "Drive Health Display Settings" on page 8-21

Use these tabs to customize your MD-VOP display options. Click a tab to make it active.

Additionally, this screen includes the following buttons:

Restore Defaults

Restores default settings.

Save

Saves current settings.

Cancel

Cancels the operation.

> **Note:** These buttons apply to all tabs.

Misc Display Settings

Click this tab to view or edit general display settings.

As shown in Figure 8–9. This tab includes the following settings:

Encryption View

Click options to enable or disable the Encryption tab and Encryption menu items in the MD-VOP main interface.

Drives Viewpoint

Click options to specify whether the library view displays tape drives as if viewing from the front (inside) or back (outside) of the library.

Save and Restore Transcripts

Click one of the following options to specify transcript settings:

- No Save/Restore

  Do not save transcripts. This is the default.

- Default Save/Restore

  Save transcripts in user directory /.mdvop/transcript.

- Local

  Specify a new location where transcripts are saved.

Drive State Display Settings

Click this tab to view or edit drive state display settings.

Figure 8–10   Drive State Display Settings
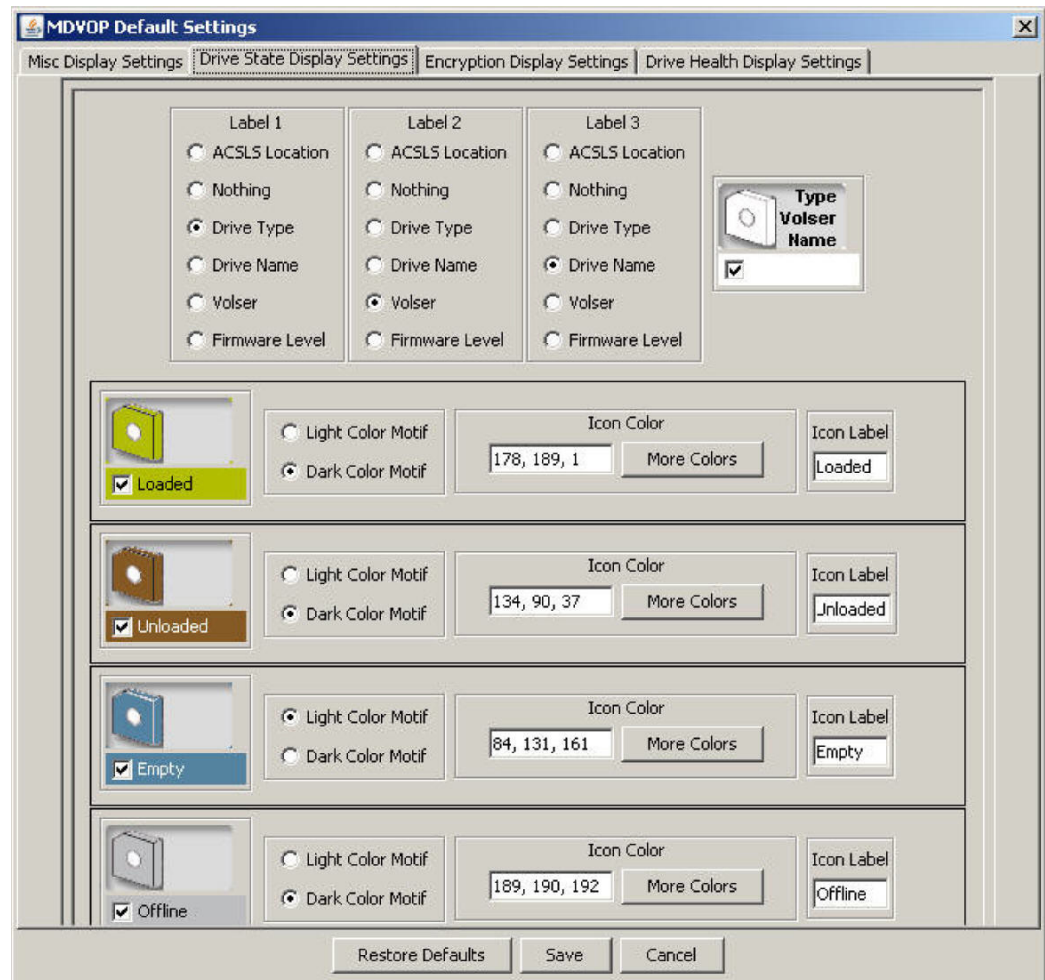
As shown in Figure 8–10, the Drive State Display Settings tab includes the following:

■   "Icon Label Settings" on page 8-19

■   "Icon Color Settings" on page 8-20

Icon Label Settings

In MD-VOP, each tape drive icon includes three label fields that can display different drive attributes.

For each label (1-3), click one of the following options to define the attribute to be displayed on the icon:

ACSLS Location

Display the location in ACSLS

Nothing

Display nothing.

Drive Type

Display the drive type.

Drive Name

Display the drive name assigned on the Configuration screen.

Volser

Display the volume serial number if a standard label tape cartridge is loaded.

Firmware Level

Displays the firmware in the tape drive.

Icon Color Settings

Additionally, this tab enables you to change the color setting and icon label for each drive state icon:

Drive state display

For each drive state, click the check box in the icon to show or hide the default display for that drive state.

Color motif

Click the options to select a light or dark color motif.

Icon color

Enter an RGB value in the dialog box, or click more colors to choose from a palette.
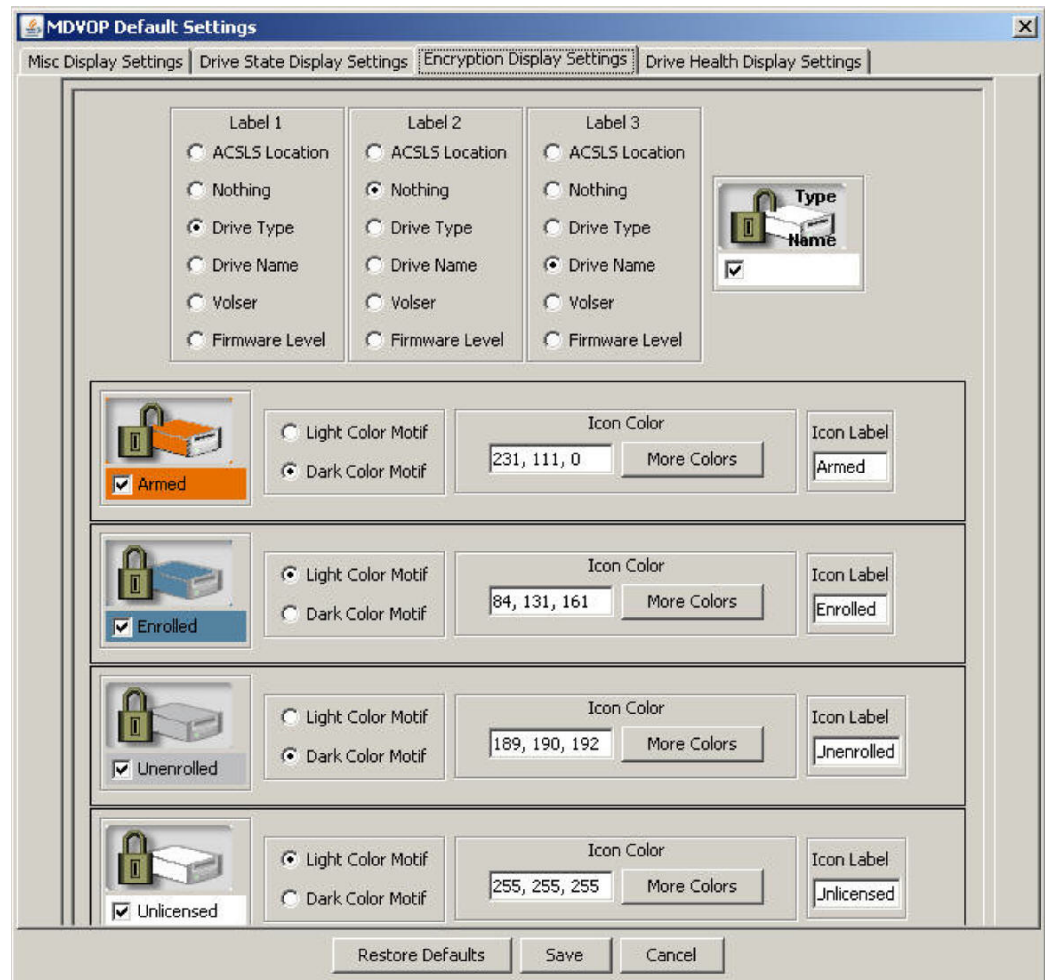
Icon label

Enter label text in the dialog box. This text is displayed beneath the icon in the Library Panel legend.

Encryption Display Settings

Click this tab to view or edit encryption display settings.
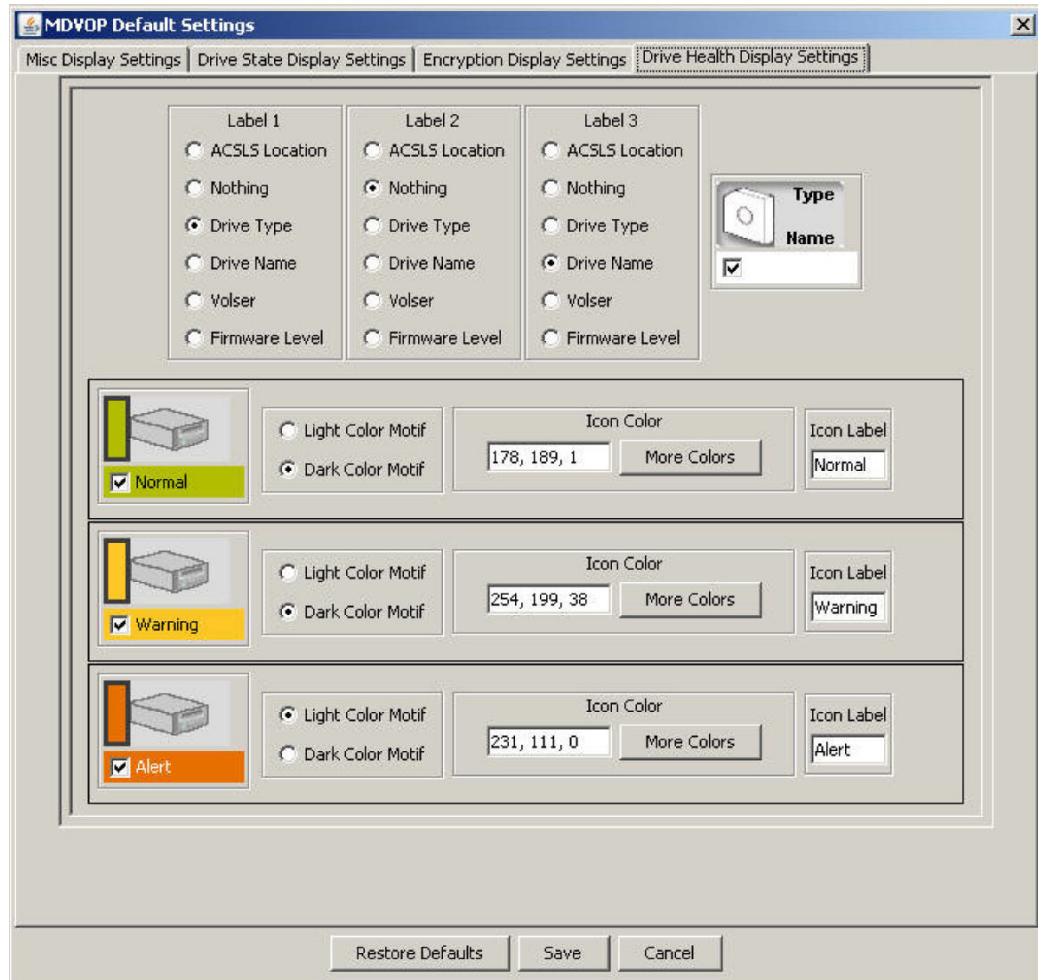
Figure 8–11   Encryption Display Settings

This tab shares the same options as the Drive State tab. See "Drive State Display Settings" on page 8-18.

Drive Health Display Settings

Click this tab to view or edit encryption display settings.

Figure 8–12   Drive Health Display Settings

This tab shares the same options as the Drive State tab. See "Drive State Display Settings" on page 8-18.

9

Using MD-VOP Library Panel Menus

This chapter describes how to use the MD-VOP Library Panel menus.

Use MD-VOP menu commands to perform functions on one or more selected tape drives.

The Library Panel includes the following menus:

- File Menu
- Drive Operations Menu
- Retrieve Menu
- Configuration Menu
- Encryption Menu
- Reports Menu

Note: Depending on your access level, some menus may not be displayed.

File Menu

The File menu includes the following commands:

Reconnect to Selected Drives in This Library

MD-VOP attempts to reconnect to the selected tape drives in the library. Use this function after a network or tape drive issue is encountered.

Reconnect to Unconnected Drives

MD-VOP attempts to reconnect to those tape drives with a failed network connection.

Refresh Icons in the Library

Refreshes tape drive icons to the last known state.

Clear Library Transcript

Clears the current library transcript (log).

Clear All Drive Transcripts

Clears all tape drive transcripts (logs) for the selected library

Drive Operations Menu

The Drive Operations menu includes the following commands, used to control the function of one or more selected tape drives. These commands may have disruptive consequences. Therefore, you are prompted to continue before a command is executed.

> **Note:** Online, offline, load, and IPL stop all active backup jobs to the selected libraries.

Health Analysis of Selected Drives in This Library

Performs a health check on selected tape drives. To view the results of this analysis, click the **Drive Health View** tab in the MD-VOP Library Panel. See "Drive Health View" on page 7-12 for more information. The Health Analysis does not affect drive functionality.

Set Selected Drives Online in This Library

Places selected tape drives in online state. This is the normal operational state.

Set Selected Drives Offline in This Library

Places selected tape drives in offline state. This state is designed for tape drive maintenance.

Load Tape Cartridges in This Library

Loads selected tape drives. A tape cartridge must be inserted in the tape drive, but not loaded.

Unload Tape Cartridges in This Library

Unloads selected tape drives. The tape cartridge is dismounted. The tape remains in the tape drive, but is not threaded.

IPL Selected Drives in This Library

Performs an IPL (Initial Power Load) of the selected tape drives. An IPL can result in the following:

- During an IPL, the tape drive is reported as not available to MD-VOP
- If a tape is present, the tape drive unloads the tape.
- If a tape is present, it may have an invalid MIR (degraded high speed access).
- Any I/O on the data path stops. Depending on the backup/archive application, the tape drive may require several minutes to recover.

Retrieve Menu

The Retrieve menu includes the following commands, used to obtain or remove logs from selected tape drives. These commands are non-disruptive.

> **Note:** This menu is only available in the system administrator version of MD-VOP

Retrieve ID Files in This Library

Retrieves a file that contains information about the global functioning of the selected tape drives.

Retrieve Dump Logs in This Library

Retrieves a memory dump that contains the full state of the selected tape drives at the moment. A dump is a SNO (Should Not Occur) meaning that the firmware detected a state that could not be addressed.

Retrieve Event Logs in This Library

Retrieves a log that contains the Fault System Codes (FSC) and events for the selected tape drives.

Retrieve Perm Logs in This Library

Retrieves a log containing non-dump events.

Retrieve All Logs in This Library

Retrieves all logs for the selected library based on the library IP address.

Delete Dump Logs in This Library

Deletes the dump logs from the selected tape drives.

Delete Event Logs in This Library

Deletes the event logs from the selected tape drives.

Delete Perm Logs in This Library

Deletes the perm logs from the selected tape drives.

Delete All Logs in This Library

Deletes all logs from the selected tape drives.

> **Note:** It is recommended that you save logs before deleting them, as they can help in troubleshooting tape drive issues.

Configuration Menu

The Configuration menu includes the following commands, used to configure the time on all selected tape drives in the library and load firmware from a file to the tape drives.

> **Note:** This menu is only available in the system administrator version of MD-VOP.

Set Clocks in This Library

Synchronizes time on the tape drives with that of the server. This is a non-disruptive operation.

Firmware Update from File in This Library

Loads firmware from a user-specified file to a tape drive. See "Performing a Firmware Update" on page 9-3.

Performing a Firmware Update

Before loading firmware from a file, consider the following:

- Do not IPL (reboot) a tape drive during a firmware update. Doing so can potentially cause the tape drive to become unusable.

- Only T10000, T9840D, and LTO 4 tape drives may be updated through the network interface.

- The tape drives you select for a firmware update must be of the same drive type.

- The tape drive checks the file being transferred and disregards firmware files that are not valid for that tape drive.

- You can load up-level or down-level firmware, without the dependencies of intermediate firmware.

- When the Code Load from File screen is displayed, the MD-VOP main interface is still visible and selectable, depending on the operating system. The interface will update, however, the menu items are disabled.

- You must manually check a T9840D to be offline before performing a firmware update. Otherwise, the tape drive will immediately display a failed indication in the firmware display.

- Firmware updates may fail, depending on network and other conditions. Once a firmware update completes, always check the selected tape drives to verify that the firmware was transferred successfully.

Loading Firmware from a File to a Tape Drive

To load firmware, do the following:

1. Select one or more tape drives that are to receive new firmware. The tape drives you select must be of the same drive type.

2. Click the **Drive Operations** menu and select **Set Selected Drives Offline**.

3. Click the **Configure** menu and select **Firmware Update from File in This Library**. A Code Load from File screen appears.

4. Locate and click the firmware file, and click the **Open** button.

5. Click the **Update** button. The Firmware Update Progress dialog box appears, displaying the tape drives that are selected for a firmware update.

Figure 9–1   Firmware Update Process Dialog
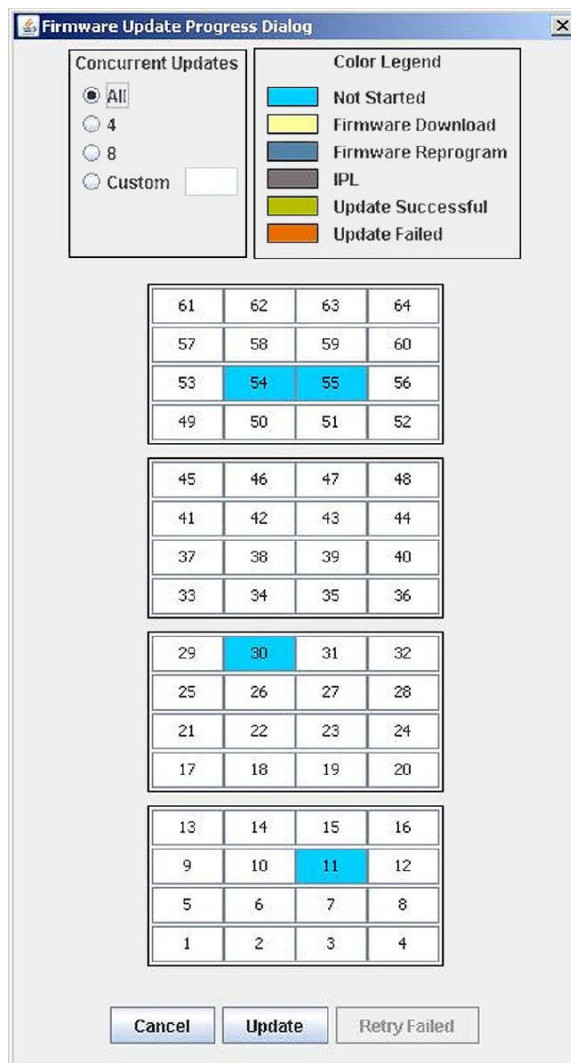
6. Click an option to select one of the following Concurrent Updates settings:

    All

    Update all selected tape drives simultaneously.

    4/8

    Update the selected tape drives in groups of four or eight, one group at a time.

    Custom

    Specify the number of tape drives to be updated simultaneously, before the next group is updated.

7. Click the **Update** button to begin transferring the firmware to the selected tape drives. The legend displays the results of each step of the process:

    Not Started

    The firmware update has not started.

    Firmware Download

    The firmware is transferring to the tape drive.

Firmware Reprogram (firmware update process has started)

The firmware process has started.

IPL

The tape drive has rebooted.

Update Successful

The Firmware update succeeded.

Update Failed

The firmware update failed.

Encryption Menu

The Encryption menu includes commands used to control mass encryption routines for tape drives in the selected library. This menu is only supported for Windows and Solaris operating systems.

> **Note:** By default, the Encryption view is not displayed, unless you indicated to include it when you installed MD-VOP. You can activate this view using the MD-VOP Default Settings screen. See "Changing MD-VOP Default Settings" on page 8-17 for more information.

The Encryption menu includes the following commands:

> **Note:** Before using these commands, you must complete the tasks described in "Encryption Command Requirements" on page 9-7.

Create OKM Agents in the Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet and uses the information to create an OKM agent. Tape drives are not affected.

Modify OKM Agents in the Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet and uses the information to modify the existing OKM agent. Tape Drives are not affected.

Enroll Drives in This Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet, and uses the information to enroll the tape drives. The following actions occur:

1. MD-VOP interrogates selected tape drives to ensure that they meet entry conditions (for example, offline, unloaded, and unenrolled).

2. MD-VOP interrogates the OKM to ensure that all agents meet entry conditions.

3. MD-VOP enrolls the tape drives with OKM.

4. MD-VOP interrogates the OKM to ensure that all agents are in the enrolled state.

Unenroll Drives in This Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet, and uses the information to unenroll the tape drives. The following actions occur:

1. MD-VOP interrogates selected tape drives to ensure that they meet entry conditions (for example, offline, unloaded, and unenrolled).

2. MD-VOP interrogates the OKM to ensure that all agents meet entry conditions.

3. MD-VOP resets the tape drives.

4. MD-VOP sets the agents to unenrolled on the OKM.

Set Drives to Unencrypting in This Library

Unenrolls the tape drives from OKM.

Compare OKM, Spreadsheet, and Drives in This Library

Verifies that the OKM, spreadsheet, and tape drives are synchronized. Tape Drives are not affected.

Create Spreadsheet Template

Creates a spreadsheet template with drive fields populated for the selected tape drives. You must manually enter agent information.

Create Spreadsheet Template with Agent Lookup

Creates a spreadsheet template with drive fields populated for the selected tape drives. Agent information (except for passphrase) is populated with information retrieved from OKM.

License Drives in This Library

Performs license operation to enable encryption on multiple tape drives in parallel.

Encryption Command Requirements

With exception of the License Drives in This Library command, Encryption menu commands require the following inputs before they can be issued:

■ You must select the tape drives on which to perform the command operation.

■ You are prompted to identify the tab-delimited .txt file or the encrypted .ect file that contains all of the drive and agent information. This information is used to exchange information with the security officer who controls OKM and the MD-VOP.

■ You are prompted to select the directory that contains the certificates obtained previously from Oracle Key Manager (OKM).

OKM Data File

You must create a tab-delimited (.txt) file that includes the required information to correlate OKM data with the intended tape drives. Use any spreadsheet program to create this tab-delimited file.

> **Note:** In most spreadsheet programs, default cell format settings cause the DMOD (tape drive serial number) to be displayed in scientific notation. To correct this, set the format to text.

Required Columns You must include the following columns in the OKM data file:

- DMOD

- Tape drive serial number

- Key Group

- OKM Agent ID

- Passphrase

- OKM Agent passphrase

- OKM IP

- IP address of the OKM attached to the tape drive

Optional Columns Optionally, you can include the following additional columns in the OKM data file:

- OKM Site ID

- Description of the OKM site server

- Description

- Description of the tape drive

- Slot Number

- Library location of the tape drive

- Drive IP

- IP address (IPV4) of the tape drive

- Drive family type

- Type of tape drive

Retrieving Certificate files from OKM

Before using the MD-VOP encryption commands, you must obtain the CA certificate and Client certificate files from OKM.

1. Launch the OKM GUI (version 2.3 or later).

2. Connect to OKM in the Operator role.

3. In the OKM GUI, click the System menu and select Save Certificates. The Save Certificates dialog box appears.

Figure 9–2   OKM Save Certificates Dialog

4. Enter the location on the MD-VOP host where certificates are to be stored. You must enter both the CA Certificate File Name and Client Certificate File Name.

5. Click the OK button to retrieve the certificate files from OKM.

Reports Menu

The Reports menu includes the following commands, used to generate reports that describe the state of one or more tape drives. When you select one of these commands, MD-VOP prompts you for a location to save the report file.

> **Note:**   This menu is only available in the system administrator version of MD-VOP

Drive Status Report

Generates a report that provides general status information for all tape drives in the library

Encryption Report

Generates a report that provides information about the encryption settings for all tape drives in the library.

Health Report

Generates a report that provides information about the health of all tape drives in the library. A separate report file is created for each selected tape drive.

ASR Report

Generates a report that provides ASR status information including a summary of activation and any alerts sent.

10

Using T10000 9840D VOP

This chapter describes how to use the T10000 9840D Virtual Operator Panel (VOP) with a single T10000 or T9840D tape drive.
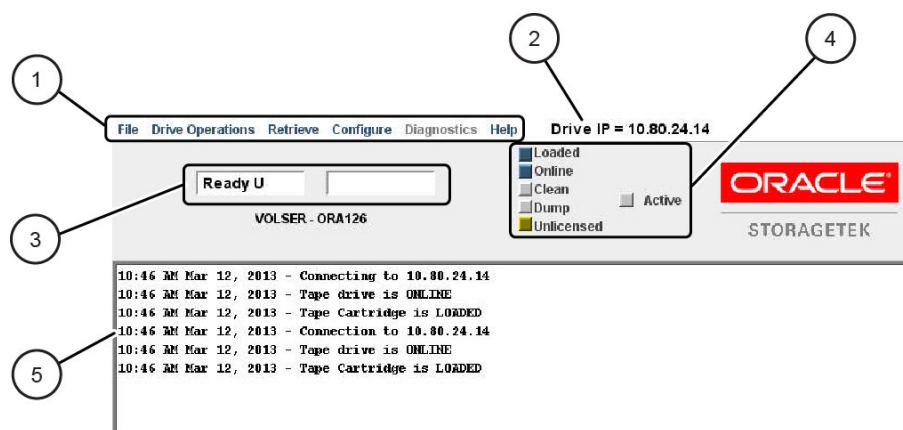
Designed for ease of use, the T10000 9840D VOP Graphical User Interface (GUI) enables you to do the following:

- Monitor tape drive status
- View or change tape drive configuration settings
- Perform tape drive operation utilities

T10000 9840D VOP Interface

Figure 10–1 shows the T10000 9840D VOP main interface:

Figure 10–1   T10000 9840D VOP Interface

Legend:

1. Menus

2. Drive IP

3. Primary and Secondary Message Windows

4. Status Indicators

5. Transcript Pane

As shown in Figure 10–1, the T10000 9840D VOP interface includes the following:

- Menus

  Use menus to issue T10000 9840D VOP commands. See ""Using T10000 9840D VOP Menus" on page 10-2 for more information.

- Drive IP

  Displays the IP address of the tape drive loaded.

- Primary and Secondary Message Windows

  Display status messages during T10000 9840D VOP processing.

- Tape Drive Status Indicators

  These indicators show the current drive state:

  - The **Empty/Loaded** status indicator indicates whether a tape cartridge is loaded in the tape drive. When you load a cartridge in the tape drive, this status indicator changes from gray to blue, and indicates Loaded.

  - The **Online/Offline** status indicator indicates whether the Ethernet adapter card is online. When you bring a tape drive online, this status indicator changes from gray to blue, and indicates Online.

  - The **Clean** status indicator indicates that the tape drive must be cleaned.

  - The **Dump** status indicator indicates that a dump is present for retrieval.

  - The **Enabled/Unlicensed** status indicator indicates whether the tape drive is encrypted.

    * When a tape drive is encrypted and has all keys, the status indicator is orange, and indicates **Enabled**.

    * When a tape drive is missing an encryption key or has not been enrolled, the status indicator is red and indicates **Unlicensed**.

    Note: You can click directly on certain status indicators to toggle the state of the monitored drive item.

- Transcript Pane

  Displays a transcript of T10000 9840D VOP actions and prompts for additional input or actions.

Using T10000 9840D VOP Menus

T10000 9840D VOP includes the following menus:

- File Menu
- Drive Operations Menu
- Retrieve Menu
- Configure Menu
- Help Menu

Depending on your access level, some menus may not be displayed. Also, certain menus require the tape drive to be offline.

File Menu

To open the File menu, click **File** in the menu bar or use the **ALT+F** keyboard shortcut. File menu commands are available when the tape drive is either online or offline.

The File menu includes the following commands:

Clear Transcript

Clears the entire T10000 9840D VOP transcript pane and closes the file menu.

Connect to Drive

Connects T10000 9840D VOP to the tape drive.

When the authentication dialog box appears, enter the tape drive IP address and click OK.

> **Note:** Optionally, you can use the **SHIFT+C** keyboard shortcut from the File menu to issue this command.

Collect Support Logs

Collects tape drive log files that you can forward to product support for analysis.

A text pane message appears after each log is collected, and a final message indicates the location of the archive (zip) message file.

> **Note:** Optionally, you can use the **SHIFT+S** keyboard shortcut from the File menu to issue this command.

Exit

Disconnects T10000 9840D VOP from the tape drive and closes the application. Allow a few seconds for the shutdown operation to complete.

Drive Operations Menu

To open the Drive Operations menu, click **Drive Operations** in the menu bar or use the **ALT+D** keyboard shortcut.

Refer to the *T10000 Tape Drive Operator's Guide* and the *T9840 Tape Drive User's Reference Manual* for additional information regarding the tape drive, use of a cartridge tape, and general operating procedures.

The Drive Operations menu includes the following commands:

> **Note:** The tape drive must be encryption-enabled for some commands to appear.

Load Tape

Loads a cartridge that is presently in the cartridge loading slot. A text pane message indicates that the tape cartridge is loaded.

> **Note:** Optionally, you can use the **SHIFT+L** keyboard shortcut to issue this command from the Drive Operations menu.

Unload Tape

Rewinds and unloads a loaded cartridge. A text pane message indicates that the tape cartridge is unloaded.

You must physically remove an unloaded cartridge from the tape drive by library robotics, or manually, from the rack mount configuration. Otherwise, the cartridge remains in the loading slot but is not loaded in the tape drive.

> **Note:** Optionally, you can use the **SHIFT+U** keyboard shortcut to issue this command from the Drive Operations menu.

Set Offline or **Set Online**

Changes the tape drive state.

- When the tape drive is online, this command indicates Set Offline.

- When the tape drive is offline, this command indicates Set Online.

You can also click the **Online/Offline** indicator to change the tape drive state.

> **Note:** Optionally, you can use the **SHIFT+O** keyboard shortcut to issue this command from the Drive Operations menu.

IPL Drive

Performs a tape drive initial program load (IPL). If the tape drive is online, a confirmation dialog box appears.

During the IPL, VOP loses communication with the tape drive. Once the IPL is successfully completed, VOP automatically reconnects with the tape drive.

Force Dump

Dumps the current contents of various drive registers to a file.

The tape drive stores the dump to internal memory, and the dump status indicator changes to orange. The forced dump operation causes a tape drive IPL, during which VOP loses connection with the tape drive. Once the IPL is successfully completed, FFFA appears in the secondary drive message window.

Format Tape

Launches the Format Tape Cartridge dialog box you can use to run the following formatting utilities:

- Make data tape

- Make code tape

- Make dump tape

- Rebuild MIR

See "Using the Format Tape Command" on page 10-5 for information about these utilities and how to run them.

Identify Drive On

Causes the Drive Status indicator on the rear panel of the tape drive to flash.

- On a T10000A/B tape drive, the indicator uses a fast flash rate

- On a T10000C tape drive, the indicator changes color between green and blue.

The indicator flashes for five minutes.

Identify Drives Off

Stops an Identify Drive On command, and the Drive Status indicator returns to the previous state.

Set Power Hibernate (T10000C tape drives only)

Forces the T10000C tape drive into the hibernation state. The status indicator to the right of the Dump indicator turns gray and indicates Hibernate.

Set Power Active (T10000C tape drives only)

Forces the T10000C tape drive out of the hibernation state. The status indicator to the right of the Dump indicator turns blue and indicates Active.

> **Note:** It takes approximately 20 seconds for the tape drive to wake from the hibernation state.

Using the Format Tape Command

To Format a Tape Cartridge:

1. Make sure the tape drive is offline.

   Use one of the following methods to set the tape drive offline:

   - Click the **Online status** indicator.

   - Open the **Drive Operations** menu and click the **Set Offline** command.

   - Use the keyboard shortcut **ALT+D** to open the Drive Operations menu, followed by **SHIFT+O** to set the drive offline.

2. Click the **Drive Operations** menu and select **Format Tape**. The Format Tape Cartridge dialog box appears.

3. Select the utility you want to run:

   - Make data tape

     This utility reformats a tape cartridge for resuse as a data tape cartridge. Existing headers are removed and the Media Information Region (MIR) is rewritten to identify the cartridge as empty, and therefore ready for write operations.

   - Make code tape

     This utility reformats a tape cartridge in a special format, and downloads the tape drive firmware from tape drive memory to the tape cartridge. The MIR is then written to identify the cartridge as a code tape. You can use the code tape to upload tape drive firmware to other tape drives.

   - Make dump tape

     This utility reformats a tape cartridge in a special format. The MIR is written to identify the cartridge as a dump trace. You can use a formatted dump tape to download diagnostic dump data from drive memory.

   - Rebuild MIR

     Use this utility to rebuild a data tape cartridge that has an invalid or corrupted MIR. The utility reads the file headers to the end of the Data mark. Then, the

MIR is rewritten to correctly reflect the tape contents. This utility can take over one hour to rebuild the MIR on a full or nearly full data cartridge. Refer to the *StorageTek T10000 Tape Drive Operator's Guide* for more information about MIR.

4. Click the Make button or use the **ALT+M** keyboard shortcut to run the selected utility.

A prompt appears in the transcript pane, directing you to insert a cartridge. If there is a cartridge in the tape drive, it unloads. You must physically remove the cartridge.

Note: Before inserting the cartridge, you can cancel the selected utility by clicking the **ABORT** button or using the **ALT+A** keyboard shortcut. Once the cartridge is inserted, the utility runs to completion.

Caution: Do not use the Make Code Tape or Make Dump Trace functions with a customer data tape.

---

5. Insert a write-enabled cartridge.

Make sure the cartridge's write protect switch is in the write-enabled position as indicated by the open padlock icon shown in Figure 10–2.

Figure 10–2   Tape Cartridge Write Protect Switch
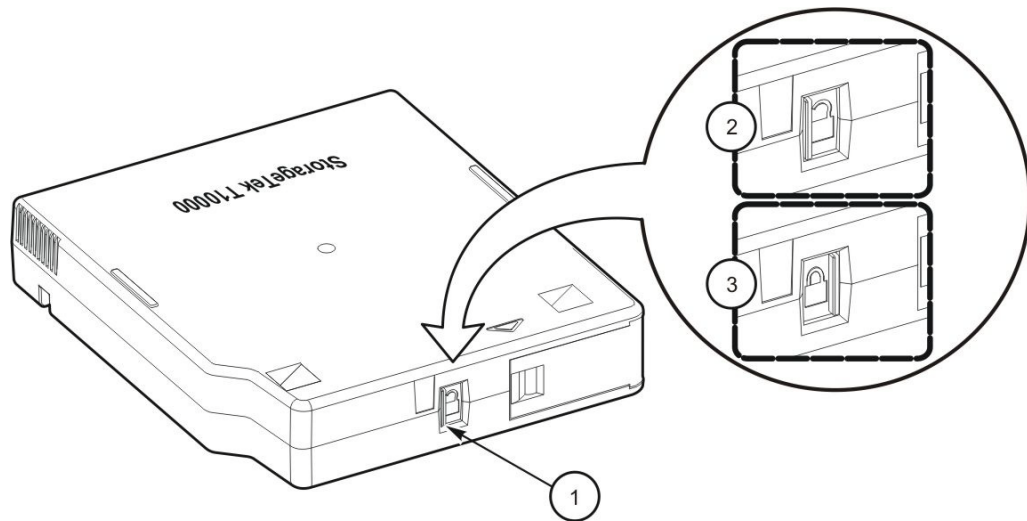
T103_409

Legend:

1. Write Protect Switch

2. Unlocked (Write Enabled) Position

3. Locked Position

When you insert a cartridge, the tape drive performs the selected utility, displays related information in the VOP transcript pane, and then unloads the cartridge.

6. Remove the unloaded cartridge.

7. Click the **DONE** button to exit.

Retrieve Menu

To open the Retrieve menu, click **Retrieve** in the menu bar or use the **ALT+R** keyboard shortcut.

The Retrieve menu includes the following commands:

View Drive Data

This command opens the View Current Drive Settings dialog box. Use the tabs in this dialog box to view current tape drive configuration settings and other tape drive data. When you're finished, click **OK** or use the **ALT+O** keyboard shortcut to close the dialog box.

This command is only available when the tape drive is offline.

Use this command for viewing purposes only. To change current tape drive settings, use the Configuration menu. See "Configure Menu" on page 10-8.

> **Note:** Optionally, you can use the **SHIFT+V** keyboard shortcut to issue this command from the Retrieve menu.

The View Current Drive Settings dialog box includes the following tabs:

- Encrypt (encryption-capable tape drive)

  Displays encryption related data.

  For additional information on FIPS aspects of the tape drive, refer to the following publications:

  – *T10000A Encrypting Tape Drive Security Policy*

  – *T10000B Encrypting Tape Drive Security Policy*

  – *T10000C Encrypting Tape Drive Security Policy*

- Fibre

  Displays information specific to the tape drive interface.

- Keyid (encryption-capable tape drive)

  Displays a list of key identifiers.

- Maintenance

  Displays maintenance settings and whether they are enabled.

- Manufacturing

  Displays factory preset settings, including drive serial number, and default world wide names.

- Missing (encryption-capable tape drive)

  Displays a list of missing key identifiers.

- Network

  Displays a network node name. The factory preset default is composed of the tape drive model number, T10000 for example, and the last nine digits of the tape drive serial number.

This tab also displays the current static IP settings.

- Power

  Displays current delay time setting for automatic hibernation, and whether hibernation is enabled for the T10000C tape drive.

- Rfid

  Displays data stored in the radio-frequency identification (Rfid) memory chip in the T10000 tape cartridge. The Rfid chip stores data related to cartridge contents and statistics. This data is similar to data stored in the media information region (MIR) on the tape, and is updated with each cartridge mount/dismount. An Rfid module in the tape drive reads the Rfid chip while the cartridge is loaded, and is viewable (read-only) by the VOP application.

- Version

  Displays tape drive-specific firmware and hardware levels.

- View Date & Time

  Displays an entry for the tape drive's internal timer setting in the VOP transcript pane. For example:

  ```
  8:55 AM Aug 2, 2010 - VOP LOGGED IN to Drive
  ```

  ```
  8:59 AM Aug 2, 2010 - Tape Drive Clock set to 07/30/2010 11
  11:52:44:670
  ```

  Notice the tape drive clock setting (8:59) is behind the VOP time on the same text line. The tape drive clock only operates while the tape drive is powered.

  Therefore, when the tape drive is not powered, the tape drive clock time can fall behind real clock time. Most library configurations set the drive clock to be synchronized with the library clock.

- ID File to File

  Retrieves and saves the ID file to the ID folder in the VOP directory.

- Dumps to File

  Retrieves diagnostic dumps that are currently stored in the drive memory, and enables you to save the dumps in a specified location. After you save the dump file, an entry is displayed in the VOP transcript pane. For example:

  ```
  9:00 AM Aug 2, 2010 - Dumps RETRIEVED to D:\T10B_dump_aug2
  ```

  ```
  8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:DMP 1
  ```

  ```
  9:00 AM Aug 2, 2010 - Retrieve Dumps in Progress
  ```

- Perms to File

  Retrieves all the permanent errors that are currently stored in the drive memory, and enables you to save the error log in a specified location.

- Logs to File

  Retrieves event logs that are currently stored in the drive memory, and enables you to save the event logs in a specified location.

Configure Menu

To open the Configure menu, click **Configure** in the menu bar or use the **ALT+C** keyboard shortcut.

The Configure menu includes commands used to change and save configuration settings, set the time on a tape drive, and load firmware from a file or tape.

> **Note:** With the exception of the Set Clock command, these commands are only available when the tape drive is offline. The tape drive should not be available to the host when you exercise any change that results in the tape drive performing an Initial Program Load (IPL) to implement the configuration change.

The Configure menu includes the following commands:

Drive Data

This command opens the Configure Drive Parameters dialog box. Use this dialog box to change and save your configuration settings. See "Configuring Drive Data" on page 10-9 for more information.

> **Note:** Optionally, you can use the **SHIFT+D** keyboard shortcut to issue this command from the Configure menu.

Save Drive Config

Saves the current tape drive configuration settings to a file. You can retrieve the saved file to restore configuration settings.

Set Clock

Sets the tape drive's internal clock to the current time in your computer. Once the clock is set, an entry is displayed in the VOP transcript pane.

Firmware Update from File

Loads firmware from a user-specified file to a tape drive.

Firmware Update from Tape

Loads firmware from a pre-recorded code tape (cartridge) to a tape drive.

During the update process, you are prompted to insert and remove the code tape cartridge containing the proper firmware release firmware level. When the update is complete, use the Version tab in the Retrieve menu to confirm the updated firmware level.

Configuring Drive Data

Click the **Configure** menu and select the Drive Data command to display the Configure Drive Parameters dialog box.

> **Note:** This command is only available when the tape drive is offline.

Use the tabs in this dialog box to access different configuration settings. Each tab includes fields to specify configuration settings, and buttons to perform related operations.

To change a setting, enter a new value in a field. The accompanying Update check box is automatically selected to indicate a change.

Once you have made your changes, do either of the following:

- Click the **Commit** button or use the **ALT+C** keyboard shortcut to commit your changes.

  If you decide against a value entered, uncheck the **Update** box and the Commit operation ignores it.

- Click the **Cancel** button or use the **ALT+N** keyboard shortcut to cancel all pending changes.

Tabs The Configure Drive Parameters dialog box includes the following tabs:

Encrypt

Use this tab to change tape drive encryption characteristics and enrollment information.

- Refer to the *Oracle Key Manager Administration Guide* for information about the use of Oracle Key Manager (OKM).

- Refer to your StorageTek T10000 tape drive publications for information about the use of Data Path Key Management (DPKM) and FIPS aspect of the tape drive.

Fibre

Use this tab to change tape drive-specific Fibre Channel configuration settings.

Network

Use this tab to change network configuration settings, including the IPv4 address and network node name.

> **Note:**   These settings are preset during manufacturing, and should only be changed at the direction of your IT manager.

- To change the static IPv4 address, enter new values for IP address, Subnet mask, and Gateway, and click the **Commit** button.

  Each parameter consists of four, three digit groups. For example:

  `010.000.000.001`

  For each three-digit group, you can enter a value from 000 to 255.

> **Note:**   If your tape drive is monitored by a Service Delivery Platform (SDP), the SDP incorporates a dynamic host control protocol (DHCP) server that assigns a dynamic IP address to the tape drive.

- To change the network node name, overwrite the existing value and click the **Commit** button.

  The factory preset network node name for a T10000 tape drive is:

  `t10000-<last nine digits of drive serial number>`

Power (T10000C only)

Use this tab to enable/disable auto hibernation and specify the auto hibernation delay time, from 0 to 60 minutes.

T10000C auto hibernation is designed to save power when a cartridge has not been mounted for a specified time period. Normally, the library monitors whether a tape

drive is hibernating and directs a tape drive to wake up whenever a mount is about to occur.

Security (T10000C only)

Use this tab set or change the tape drive password.

To change your password, enter the current password and new password, reenter the new password, and then click the **Commit** button.

> **Note:** If the tape drive password has not previously been changed, enter default for the current password.

New passwords must be 8-16 characters, and must include each of the following character types:

- Upper case character
- Lower case character
- Number
- Special character

> **Note:** ! @ # $ % ^ & * ( ) { } { } + = - _ are valid special characters.

Buttons The Configure Drive Parameters dialog box includes the following buttons:

Load Drive Config

Click this button or use the **ALT+L** keyboard shortcut to import a previously saved configuration file. After the imported file is opened, all tabs are populated with the saved configuration settings. Marked Update check boxes identify changed settings.

Make any necessary changes to settings, and then click the **Commit** button or use the **ALT+C** keyboard shortcut to save your settings.

> **Note:** The imported configuration file includes parameters specific to the originating tape drive. Be sure to clear or reset tape drive-specific parameters to accurately reflect the tape drive that imported the saved configuration file.

Commit

Click this button or use the **ALT+C** keyboard shortcut to initiate an IPL to save and activate all pending changes. When you click the Commit button, only those fields with an active check box are updated.

During the commit process, VOP loses connection to the tape drive when IPL begins. However, VOP automatically reconnects to the tape drive after successful IPL.

Click this button to save the configuration settings in NVRAM. The Ethernet card reboots when you change an IP setting.

Cancel

Click this button or use the **ALT+N** keyboard shortcut to unselect all pending setting changes.

Drive Data Settings The following describes the general tape drive data settings included in the Configure Drive Parameters dialog box.

> **Note:** Additional settings may be displayed, depending on drive type and firmware levels.

Emulation

Available emulation options are dependent on the active interface, tape drive model, and firmware version.

Data Compression

The following describes data compression options:

> **Note:** The option defaults to the last saved selection.

- No

  Data is not compressed. but can be overridden by the host for a job.

- Yes

  Data is compressed, but can be overridden by the host for a job. This is the factory default setting.

- Off

  Data compression is disabled, and cannot be overridden by the host.

Data Security Erase

The following describes data security erase options:

- Yes

  Enables a full data security erase. A random binary pattern is written on the media, over-writing existing data, from the point of an "Erase" command to the End of Tape mark. This is the factory default.

- No

  Writes an end of tape mark on the media that indicates valid data does not exist beyond the point of an "Erase" command. Data is actually still present beyond the end of data mark, and it can be retrieved by special tape utilities.

Standard Label Protect

The following describes standard label protect options:

- Yes

  Enables standard label protection.

  – Select Yes if label overwrite code is loaded, or if running standard labels and want the tape drive to display an irrecoverable error (CHK 33EX) when writing a non-80-byte record for VOLSER or HDR1.

  – POST WRCART cannot be run with Yes selected.

- No

  Disables standard label protection. This is the factory default.

Select No if you are using NL or NSL tape processing.

Library Address

The library address text field contains a two-character hexadecimal value set to ff at the factory.

This setting should remain at ff for all libraries except for the 9310 Powderhorn library, where the address is keyed to the drive cabinet position, as viewed from the cabinet rear.

Valid entries for the 9310 Powderhorn Library 9741/9741E drive cabinet are 00-09 (top, down), left column; and 0A-13 (top, down) right column.

Tape Completion Display

This setting determines whether tape completion percentages are displayed in the SDVOP secondary window when a tape cartridge is loaded in the tape drive.

This display is superseded by higher priority messages that display in the SDVOP secondary window.

- **Yes**

  Tape completion percentages are displayed.

- **No**

  Tape completion percentages are not displayed.

Language

This setting specifies the language in which certain operational messages (for example, loading, unloading.) appear in the SDVOP drive message windows. The following languages are supported:

- English (the default)
- Espanol
- Francais
- Italiano
- Deutsch

World Wide Name

> **Caution:** Indiscriminately changing the WWN could result in the tape drive being unavailable to the host.

The World Wide Name (WWN) identifies the tape drive node. This string of 16 hexadecimal characters represents a 64-bit, unique identifier that distinguishes the individual tape drive from all other devices worldwide. Characters 2 through 6 identify the specific manufacturer. Oracle StorageTek branded devices have the company ID "00104F". Other characters reveal additional tape drive-specific information.

The custom label indicates that a customized WWN is active.

The (default) label indicates that the WWN was preset at the factory. For example:

```
World Wide Name(default): 50:01:04:f0:00:93:c6:9d
```

Manufacturing assigns a block of three WWNs (from a pool of company-specific WWNs) to each tape drive during the manufacturing process. One for the tape drive and one each for the two fiber-optic interface ports. The tape drive node is assigned the first WWN of the block, and the next two WWNs, in sequence, are assigned to the ports.

Certain libraries override the default WWN with a library-assigned dynamic WWN (dWWN). Typically, only the last four characters differ from the default WWN. When dWWNs are active, (library) appears in the label.

You can also manually override the WWN with a custom WWN. In some circumstances, a service representative might customize a replacement tape drive's WWN to be the same as the replaced, defective tape drive's WWN. This precludes a requirement for a full system reset to acknowledge a new WWN.

If you apply a custom WWN to the tape drive node, you must also apply custom WWNs to the interface ports.

Interface Port Attributes Port physical address attributes are only used when the tape drive is in an arbitrated-loop. The settings are not applicable when the tape drive is in an interface fabric.

There are two identical interface port attribute groups:

- Pa = Port A

- Pb = Port B

Hard-assigned Physical Address

- **Yes**

  The tape drive uses a specified hard physical address (PA).

- **No**

  The tape drive seeks a soft PA. This is the default.

Arbitrated Loop Address (loop ID)

This entry (0 - 125) specifies the loop ID when the Hard PA selection is Yes. Factory-preset defaults are: 0 for Port A, 1 for Port B.

Soft-assigned Physical Address (Hi/Lo)

> **Note:** Soft PA is valid when the Hard PA selection is No.

- **Hi**

  The tape drive seeks an available loop ID in a descending order.

- **Lo**

  The tape drive seeks an available loop ID in a descending order. This is the default

Maximum Receive Size

> **Caution:** POTENTIAL DRIVE DAMAGE. Older versions of VOP display several size options. The smaller size options are not valid with the T10000 tape drive. Furthermore, an attempt to switch to any setting other than 2112 or 2048, could cause the tape drive to fail to complete the IPL. DO NOT select a size option other than 2112 or 2048.

The maximum receive (max recv) size value determines the maximum data frame size for data processing. There are two values:

- 2112

- 2048

212 is the factory setting. Do not change this value unless directed by your IT Manager or StorageTek support representative. The option defaults to the last saved selection.

World Wide Name Override Each port has a unique WWN that you can override. See "World Wide Name" on page 10-13 for more information.

If you apply a custom WWN to the tape drive node, you must also apply custom WWNs to the interface ports. When a customized WWN is active, (custom) appears in the label.

Speed Negotiation

> **Note:** Do not change the speed setting unless directed by your IT manager or StorageTek Support.

The Speed Negotiation options depend on the capability of the interface transceiver present in the tape drive. The following options are available for a 4 Gbit tape drive:

- Auto

- 1GB

- 2GB

- 4GB

When you select Auto, the tape drive operates at the negotiated interface speed, which is typically determined by the slowest attached device. Auto is preset at the factory.

When you select a fixed rate, the tape drive only operates at the specified speed and might cause the tape drive to be unavailable, unless all other interface devices are set to the same speed.

File Sync Accel The StorageTek File Sync Accelerator (FSA) allows applications to reduce or eliminate back hitches that are normally caused by writing a tape mark or other sync operations. Click the appropriate button to enable or disable the feature.

Tape App Accel The StorageTek Tape Application Accelerator (TAA) avoids back hitches by converting tape marks to buffered tape marks and syncs to NO-OPs. The feature is only available with FICON. Click the appropriate button to enable or disable the feature.

This feature must only be used in environments that handle deferred errors. When this feature is enabled, sending a tape mark does not ensure that data has successfully been

written to the tape. A deferred error may be reported when buffered data is written to tape after the command has completed. In a FICON only environment, duplex write operations should use this feature.

Max Capacity Maximum capacity allows the use of tape capacity that is normally reserved to ensure tape-to-tape copy operations succeed. Enabling this feature can increase cartridge capacity by five to ten percent.

Help Menu

To open the Help menu, click **Help** in the menu bar or use the **ALT+H** keyboard shortcut.

> **Note:** Help menu commands are available when the tape drive is either online or offline.

The Help menu includes the following commands:

About

Displays a dialog box that provides the following information about the VOP application and environment.

- Role level access

- VOP Version

- VOP Build Date

- Drive Name (if a tape drive is connected)

- Drive Type (if a tape drive is connected)

- Java Version

- License Agreement

> **Note:** Optionally, you can use the **SHIFT+A** keyboard shortcut to issue this command from the Help menu. To close the dialog, click **OK** or use the **ALT-O** keyboard shortcut.

FSC Dictionary

Opens the FSC Look Up dialog box, used to perform a lookup in the Fault System Code (FSC) Dictionary

> **Note:** The FSC Dictionary is available with or without a tape drive connection.

When the FSC Look Up dialog box appears, enter an FSC number, select the dictionary for the tape drive model, and click the LOOKUP button. The fault system code description is displayed in the VOP transcript pane. For example:

```
FSC: A33A |NO TAPE IS |LOADED | ***

MIM Code: NONE
```

```
FRU: OPER. ERROR CONF: 100%
```

```
Field Text:
The user requested motion operation that requires a tape to be
installed, however, a tape has not been loaded.
```

11

Using LTO VOP

This chapter describes how to use the LTO Virtual Operator Panel (VOP) with a single encryption-enabled HP or IBM Linear Tape Open (LTO) Ultrium LTO-4, LTO-5, or LTO-6 tape drive.

Designed for ease of use, the LTO VOP Graphical User Interface (GUI) enables you to do the following:

- Monitor tape drive status

- Monitor tape drive status

- Perform tape drive service tasks

LTO VOP Interface

Figure 11–1 shows the LTO VOP main interface:

Figure 11–1   LTO VOP Interface
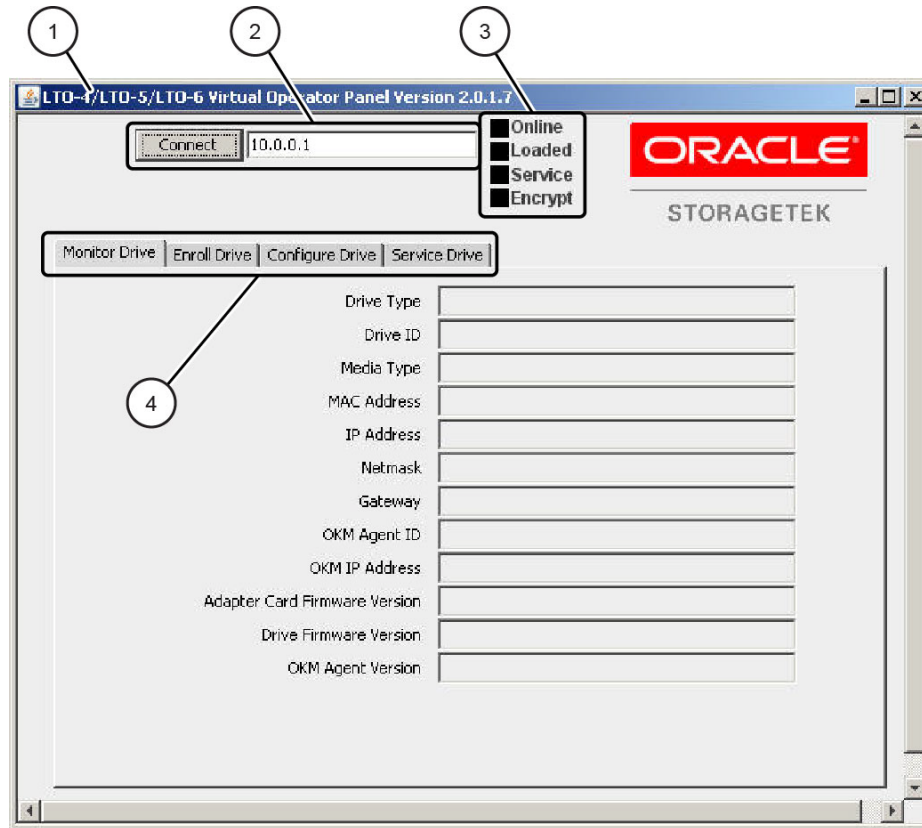
Legend:

1. Title Bar (Includes Menus)

2. Connect Button

3. Tape Drive Status Indicators

4. Function Tabs

As shown in Figure 11–1, the LTO VOP interface includes the following:

- Title Bar

  Click the icon in the title bar to access a basic menu you can use to re-size the window and close the application.

- Connect Button

  Enter the IP address of your LTO tape drive in the accompanying field and click the Connect button.

- Tape Drive Status Indicators

  These indicators show the current drive state:

  - The **Online/Offline** status indicator indicates whether the Ethernet adapter card is online. When you bring a tape drive online, this status indicator changes from gray to blue, and indicates Online.

- The **Empty/Loaded** status indicator indicates whether a tape cartridge is loaded in the tape drive. When you load a cartridge in the tape drive, this status indicator changes from gray to blue, and indicates Loaded.

- The **Service** status indicator indicates whether the Ethernet card is communicating with the tape drive.

- The **Encryption** status indicator indicates whether the tape drive is enrolled for encryption.

> **Note:** You can click directly on certain status indicators to toggle the state of the monitored tape drive item.

- Function Tabs

  These tabs provide functions used to configure, monitor, and service the tape drive. See "LTO VOP Function Tabs" on page 11-3 for more information.

  During the course of selected operations, the message pane located on the Service Drive tab displays a transcript of LTO VOP actions and prompts for additional input.

Changing the Online/Offline Status of a Drive

Certain LTO VOP functions require the tape drive to be offline.

Changing Drive Status to Offline

Do the following:

1. Determine the current drive state.

   View the Online/Offline status indicator. If the tape drive is online, proceed with the next step. If the tape drive is offline, stop.

2. Change the drive state to Offline using one of the following methods:

   - Click the first status indicator.

   - Click the **Enroll Drive** tab and then click the **Set Offline** button.

   - Click the **Configure Drive** tab and then click the **Set Offline** button.

3. Verify that the tape drive is offline.

   The first Online/Offline status indicator is gray and is labeled **Offline**. In addition, the button in the Enroll Drive tab is labeled **Set Online**.

Error Messages

Depending on conditions, certain LTO VOP functions result in error conditions. For example, an error occurs if you attempt to place the tape drive (adapter card) offline while a tape cartridge is loaded.

LTO VOP Function Tabs

LTO VOP includes the following tabs used to perform various functions on the tape drive:

- Monitor Drive

- Enroll Drive

- Configure Drive

- Service Drive

The following sections describe these function tabs.

Monitor Drive

Click this tab to display a list of tape drive, cartridge, and OKM agent attributes and values for those attributes. Some attributes require an additional action, such as tape drive enrollment for encryption, before the associated data appears.

Figure 11–2 shows an example of the Monitor Drive page:

Figure 11–2   LTO VOP Monitor Drive tab

As shown in Figure 11–2, this page lists the following tape drive attributes:

- Drive Type

- Drive ID

- Media Type

- MAC Address

- IP Address

- Netmask

- Gateway

- IPv6 Local Address

- OKM Agent ID

- OKM IP Address

- Adapter Card Firmware Version

- Drive Firmware Version

- OKM Agent Version

Enroll Drive

> **Note:** Refer to your encryption documentation before using this page. The sequence for using the Configure Drive and Enroll Drive tabs is critical to success.

Click this tab to access functions used to specify enrollment settings and enroll the tape drive adapter card.

Figure 11–3 shows an example of the Enroll Drive page:

Figure 11–3   LTO VOP Enroll tab

As shown in Figure 11–3, this page includes fields to specify enrollment settings, and buttons to perform related operations.

To change a setting, enter a new value in a field. The accompanying Update check box is automatically selected to indicate a change.

Fields

The Enroll Drive page includes the following fields:

KMA Agent ID

The KMA agent defined in OKM.

KMA IP Address

The KMA service network address.

Passphrase

The KMA agent passphrase defined in OKM.

Confirm Passphrase

Confirmation of the KMA agent passphrase.

> **Note:**   Before you enroll a tape drive, you must create the agent with the passphrase assigned in the OKM. The OKM must be able to communicate with the adapter card and tape drive.

Buttons

The Enroll Drive page includes the following buttons:

Set Offline

Click this button to set the tape drive offline.

The label on this button changes depending on the current drive state (for example, the label is **Set Offline** when the drive state is Online).

Commit

Click this button to save the enrollment settings in NVRAM. The Ethernet card does not reboot if you only change the enrollment settings.

When you click the Commit button, only those fields with an active check box are updated.

Enroll

After you commit your enrollment settings, click this button to enroll the drive.

Cancel

Click this button to cancel all pending setting changes.

Configure Drive

> **Note:**   Refer to your encryption documentation before using this page. The sequence for using the Configure Drive and Enroll Drive tabs is critical to success.

Click this tab to access functions used to specify IP settings for the tape drive. This page is typically used by the service representative to configure the tape drive to use settings other than those set during the manufacturing process.

Figure 11–4 shows an example of the Configure Drive page:

Figure 11–4   LTO VOP Configure Drive tab

As shown in Figure 11–4, this page includes fields to specify IP settings, and buttons to perform related operations.

To change a setting, enter a new value in a field. The accompanying Update check box is automatically selected to indicate a change.

Fields

The Configure Drive page includes the following fields:

IP Address

Enter the IP address for the tape drive.

Netmask

Enter the Netmask for the tape drive.

Gateway

Enter the Gateway for the tape drive.

Buttons

The Configure Drive page includes the following buttons:

Set Offline

Click this button to set the tape drive (adapter card) offline.

The label on this button changes depending on the current drive state (for example, the label is **Set Offline** when the drive state is Online).

Commit

Click this button to save the IP settings in NVRAM. The Ethernet card reboots when you change an IP setting. When you click the **Commit** button, only those fields with an active check box are updated.

Cancel

Click this button to unselect all pending setting changes.

Service Drive

Note: Refer to your encryption documentation before using this page.

Click this tab to access functions used to perform service functions on the tape drive. These functions are primarily intended for the service representative.

Figure 11–5 shows an example of the Service Drive page:

Figure 11–5 LTO VOP Service Drive tab
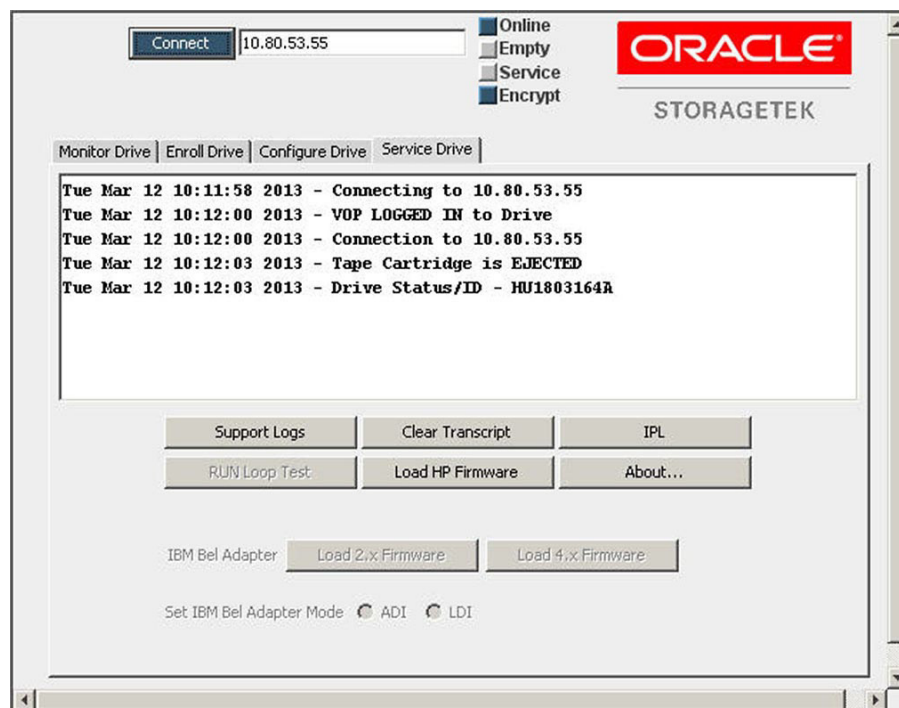
As shown in Figure 11–5, this page contains a text-based transcript area and the following buttons:

Support Logs

Saves log files to a specified location.

Clear Transcript

Erases the content displayed in the text pane.

IPL

Performs an Initial Program Load (IPL) of the Ethernet card.

RUN Loop Test

Performs an internal loopback test on the tape drive.

Load HP Firmware

Starts the Ethernet card firmware update procedure. You are prompted to identify the directory that contains the Ethernet card firmware files.

IBM Bel Adapter

Click one of the following buttons to specify the IBM Bel Adapter code version:

- Load 2.x Firmware (LDI only)

- Load 4.x Firmware (ADI or LDI)

You must power cycle the drive after the adapter firmware update is complete.

Set IBM Bel Adapter Mode

This option is only available when running version 4.x of the Adapter firmware.

Click one of the following options to specify the IBM Bel Adapter mode:

- ADI (Analog/Digital Interface)

- LDI (Library/Drive Interface)

About

Displays LTO VOP version, basic tape drive information, and copyright information. For example:

Figure 11–6   LTO VOP About Dialog

12
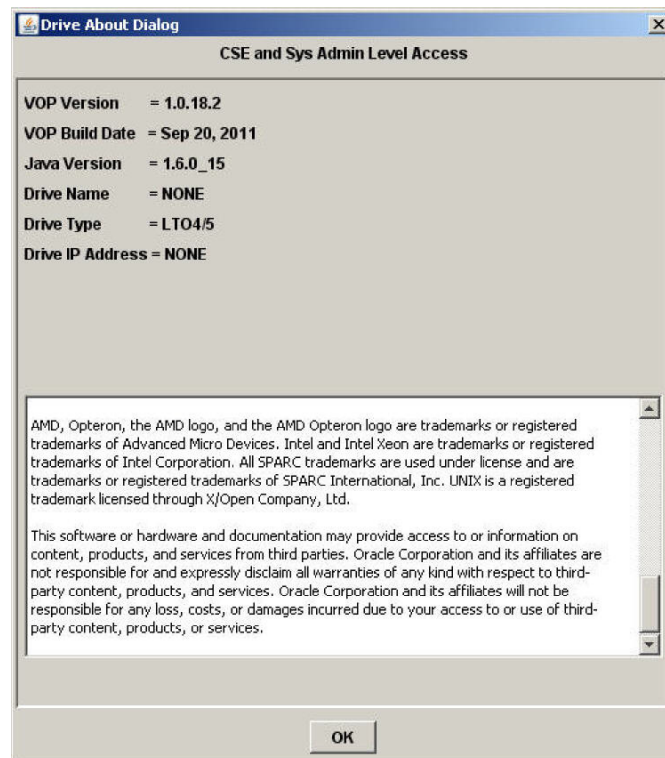
Using 9XXX VOP

This chapter describes how to use the 9XXX Virtual Operator Panel (VOP) with a single T9840B, T9840C, T9940A, or T9940B tape drive.

Designed for ease of use, the 9XXX VOP Graphical User Interface (GUI) enables you to do the following:

- Monitor tape drive status
- View or change tape drive configuration settings
- Perform tape drive operation utilities

9XXX VOP Interface

Figure 12–1 shows the 9XXX VOP main interface:

Figure 12–1   9XXX VOP Interface
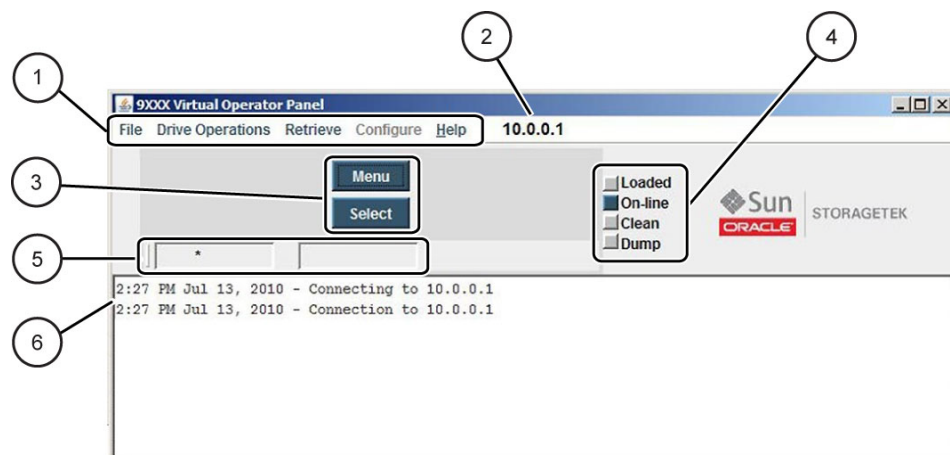
Legend:

1. Menus

2. Drive IP

3. Menu and Select Switches

4. Primary and Secondary Message Windows

5. Status Indicators

6. Transcript Pane

As shown in Figure 12–1, the 9XXX VOP interface includes the following:

- Menus

  Use menus to issue 9XXX VOP commands. See "Using 9XXX VOP Menus" on page 12-2 for more information.

- Drive IP

  Displays the IP address of the tape drive loaded.

- Menu/Select Switches

  Use these switches to access the tape drive menu system. See "Using Menu and Select Switches" on page 12-6 for more information.

- Tape Drive Status Indicators

  These indicators show the current drive state:

  - The **Empty/Loaded** status indicator indicates whether a tape cartridge is loaded in the tape drive. When you load a cartridge in the tape drive, this status indicator changes from gray to blue, and indicates Loaded.

  - The **Online/Offline** status indicator indicates whether the Ethernet adapter card is online. When you bring a tape drive online, this status indicator changes from gray to blue, and indicates Online.

  - The **Clean** status indicator indicates that the tape drive must be cleaned.

  - The **Dump** status indicator indicates that a dump is present for retrieval.

- Primary and Secondary Message Windows

  Display status messages during 9XXX VOP processing.

- Transcript Pane

  Displays a transcript of 9XXX VOP actions and prompts for additional input or actions.

Using 9XXX VOP Menus

9XXX VOP includes the following menus:

- File Menu

- Drive Operations Menu

- Retrieve Menu

- Configure Menu

- Help Menu

> **Note:** Certain menus require the tape drive to be offline.

File Menu

File menu commands are available when the tape drive is either online or offline. The File menu includes the following commands:

Clear Transcript

Clears the entire 9XXX VOP transcript pane and closes the file menu.

Connect to Drive

Connects 9XXX VOP to the tape drive. When the authentication dialog box appears, enter the tape drive IP address and click **OK**.

> **Note:** Optionally, you can use the **SHIFT+C** keyboard shortcut from the File menu to issue this command.

Display 9XXX Logs from File

Displays tape drive logs from a specified file.

Exit

Disconnects 9XXX VOP from the tape drive and closes the application. Allow a few seconds for the shutdown operation to complete.

Drive Operations Menu

To open the Drive Operations menu, click **Drive Operations** in the menu bar or use the **ALT+D** keyboard shortcut.

Refer to the *T9x40 Tape Drive User's Reference Manual* for additional information regarding the tape drive, use of a cartridge tape, and general operating procedures.

The Drive Operations menu includes the following commands:

> **Note:** The tape drive must be encryption-enabled for some commands to appear.

Unload Tape

Rewinds and unloads a loaded cartridge. A text pane message indicates that the tape cartridge is unloaded.

You must physically remove an unloaded cartridge from the tape drive by library robotics, or manually, from the rack mount configuration. Otherwise, the cartridge remains in the loading slot but is not loaded in the tape drive.

> **Note:** Optionally, you can use the **SHIFT+U** keyboard shortcut to issue this command from the Drive Operations menu.

IPL Drive

Performs a tape drive initial program load (IPL).

If the tape drive is online, a confirmation dialog box appears. During the IPL, VOP loses communication with the tape drive. Once the IPL is successfully completed, VOP automatically reconnects with the tape drive.

Force Dump

Dumps the current contents of various drive registers to a file.

The tape drive stores the dump to internal memory, and the dump status indicator changes to orange. The forced dump operation causes a tape drive IPL, during which

VOP loses connection with the tape drive. Once the IPL is successfully completed, FFFA appears in the secondary drive message window.

Retrieve Menu

To open the Retrieve menu, click **Retrieve** in the menu bar or use the **ALT+R** keyboard shortcut.

The Retrieve menu includes the following commands:

Dumps to File

Retrieves diagnostic dumps that are currently stored in the drive memory, and enables you to save the dumps in a specified location. After you save the dump file, an entry is displayed in the VOP transcript pane. For example:

```
8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:Dmp 1

8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:DMP 1

9:00 AM Aug 2, 2010 - Retrieve Dumps in Progress

9:00 AM Aug 2, 2010 - Dumps RETRIEVED to D:\T9840B_dump_aug2
```

Logs to File

Retrieves event logs that are currently stored in the tape drive memory, and enables you to save the event logs in a specified location.

Perms to File

Retrieves all the permanent errors that are currently stored in the tape drive memory, and enables you to save the error log in a specified location.

Retrieves a log containing non-dump events.

Get and Display Logs

Retrieves and displays event logs that are currently stored in the tape drive memory.

Delete Dumps

Deletes all diagnostic dumps from the tape drive.

Delete Logs

Deletes all event logs from the tape drive.

Delete Perms

Deletes all permanent errors from the tape drive.

> **Note:**   It is recommended that you save logs before deleting them, as they can help in troubleshooting tape drive issues.

Configure Menu

With the exception of the Set Clock command, these commands are only available when the tape drive is offline. The tape drive should not be available to the host when you exercise any change that results in the tape drive performing an Initial Program Load (IPL) to implement the configuration change.

The Configure menu includes the following commands:

Set Clock

Sets the tape drive's internal clock to the current time in your computer. Once the clock is set, an entry is displayed in the VOP transcript pane.

Code Load from File

Loads firmware from a user-specified file to a tape drive. See "File Menu" on page 12-2 for more information.

Loading Drive Firmware

Use 9XXX VOP menus, 9XXX VOP controls, and the tape drive menu system to load drive firmware.

1. From the 9XXX interface, click the **Menu** button to enter the tape drive menu system.

   The primary message window displays **Online**, and the status indicator is blue.

2. Click the **Select** button to place the tape drive in an Offline state.

   The primary message window displays **Offline**, and the status indicator changes to gray.

3. Click the **Configure** menu and select **Code Load from File**.

   The Open dialog box appears.

4. Locate the firmware file and click the **Open** button.

   The 9XXX transcript pane displays **START Code Load from File**. As the process continues, the transcript displays additional messages regarding the code load, IPL, and re-connection to 9XXX VOP.

   > **Note:** The code load process may take several minutes

5. Click the **Menu** button to display the code version in the primary message window.

6. Use the **Menu** and **Select** buttons to exit the drive menu system.

7. Click the **File** menu and select **Exit**.

8. Disconnect the crossover Ethernet cable from the tape drive Ethernet port.

9. Set your PC to obtain an IP address automatically.

Help Menu

To open the Help menu, click **Help** in the menu bar or use the **ALT+H** keyboard shortcut. Help menu commands are available when the tape drive is either online or offline.

The Help menu includes the following commands:

About

Displays a dialog box that provides the following information about the 9XXX application and environment.

- Role level access
- VOP Version (single tape drive application)
- VOP Build Date (single tape drive application)

- Drive Name (if a tape drive is connected)

- Drive Type (if a tape drive is connected)

- Java Version

- License Agreement

> **Note:** Optionally, you can use the **SHIFT+A** keyboard shortcut to issue this command from the Help menu. To close the dialog, click **OK** or use the **ALT-O** keyboard shortcut.

FSC Dictionary

Opens the FSC Look Up dialog box, used to perform a lookup in the Fault System Code (FSC) Dictionary. The FSC Dictionary is available with or without a tape drive connection.

When the FSC Look Up dialog box appears, enter an FSC number, select the dictionary for the tape drive model, and click the **LOOKUP** button. The fault system code description is displayed in the VOP transcript pane. For example:

```
FSC: A33A  |NO TAPE IS      |LOADED              | ***

MIM Code:  NONE

FRU:       OPER.  ERROR CONF:  100%

Field Text:

The user requested motion operation that requires a tape to be installed,
however, a tape has not been loaded.
```

Using Menu and Select Switches

The portion on the 9XXX interface between the menu bar and transcript pane contains elements designed to mimic the physical operator panel on a 9x40 tape drive.

Use the **Menu** and **Select** buttons to access the tape drive's menu system.

It is assumed that you fully understand the tape drive menu system. Refer to the *T9x40 Tape Drive Service Reference Manual* for a detailed description of the drive menu system.

Menu Button

Click the **Menu** button to enter the drive menu system or advance to the next portion of the drive menu system. Menu options and values display in the primary message window.

Figure 12–2 shows an example:

Figure 12–2   9XXX VOP Menu Switch
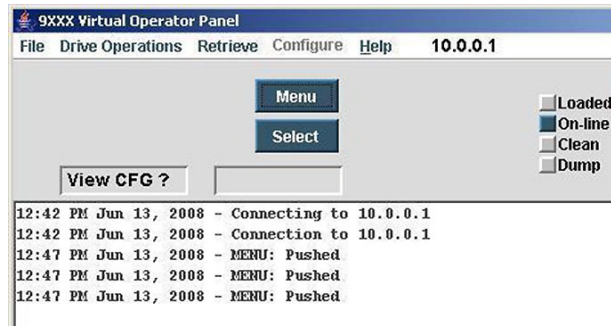
As shown in Figure 12–2, the Menu button has been clicked several times and **View CFG?** appears in the primary message window.

Select Button

Click the **Select** button to advance to the next available menu option or value, to enter a submenu (such as View CFG?), or to exit from either a submenu or the main menu system.

Figure 12–3 shows an example:

Figure 12–3   9XXX VOP Select Switch
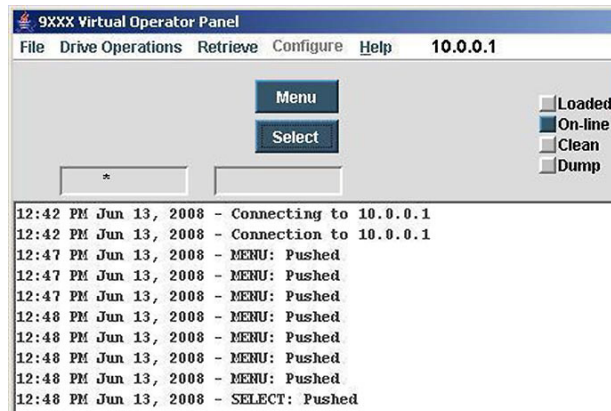
As shown in Figure 12–3, the Select button has been clicked, resulting in an exit from the main menu system. An asterisk (*) appears in the primary message window.

A

Changing the Default MD-VOP User File Directory

By default, MD-VOP stores user created files under the User home directory, in a subdirectory called .mdvop.

You can edit the MD-VOP launch scripts as follows to override the default home directory where the .mdvop directory resides.

Changing the Default Directory in Windows

Access the MD-VOP executable file, mdvop.bat, in a text editor and insert the following statement in both entries:

```
-Dapplication.user.home=<new root path>
```

> **Note:** Substitute your new directory path for *new root path*.

In the following example, the inserted statements are shown in bold:

```
start %javalocation% -classpath %classpatha% -
```

Dapplication.user.home=<new root path> -

```
Djava.security.policy=rmi.policya %policya% -view

start %javalocation% -classpath %classpatha% -
```

Dapplication.user.home=<new root path> -

```
Djava.security.policy=rmi.policya %policya% -view %1
```

Changing the Default Directory in UNIX

Access the MD-VOP executable file, mdvop, in a text editor and insert the following statement in the first two entries:

```
-Dapplication.user.home=<new root path>
```

> **Note:** Substitute your new directory path for *new root path*.

In the following example, the inserted statements are shown in bold:

```
${javalocation} -classpath "${startlib}" -
```

Dapplication.user.home=<*new root path*> -

Djava.security.policy=${policycurrent} -cse

${javalocation} -classpath "${startlib}" -

Dapplication.user.home=<*new root path*> -

Djava.security.policy=${policycurrent} -cse ${properties} &

> **Note:** You do not need to edit the third entry.

Glossary

Some definitions in this glossary are taken from other glossaries. For these definitions, the source of the definition is indicated by letters in parentheses, following the definition:

(A) The American National Standard Dictionary of Information Systems, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI).

(E) The ANSI/Electronic Industries Association (EIA) Standard-440-A, Fiber Optic Terminology.

(I) The Information Technology Vocabulary, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and International Electrotechnical Commission (ISO/IEC/JTC1/SC1).

(IBM) The IBM Dictionary of Computing, copyright 1994 by IBM.

(T) Draft international standards committee drafts, and working papers being developed by the ISO/IEC/JTC1/SC1.

address

A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A).

alphanumeric

A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A).

capacity

Total amount of User Data stored on one data cartridge in 8 bit bytes. Synonymous with "User Capacity" or "Native Capacity". This is the capacity that the user sees after the ECC/Format/ERP etc. overhead has been assessed (no compression).

capacity, raw

Total amount of data stored on one data cartridge in 8 bit bytes before any ECC/Format/ERP etc. overhead has been assessed (no compression).

capacity, user

Total amount of data stored on one data cartridge in 8 bit bytes that is sent by the host computer. This is the capacity that the user sees after the ECC/Format/ERP etc. overhead has been assessed (no compression).

cartridge

A storage device that consists of magnetic tape on supply and takeup reels, in a protective housing. (IBM)

cleaning cartridge

A data cartridge that contains special material to clean the tape path in a transport or drive.

compress

To save space by eliminating gaps, empty fields, redundancy, or unnecessary data to shorten the length of records or files. (IBM)

configuration

The manner in which the hardware and software of an information processing system is organized and interconnected. (T)

connector

An electrical or optical part that joins two or more other parts.

data cartridge

A container holding magnetic tape that can be processed without separating the tape from the container.

data path key management (DPKM)

See **DPKM**.

data security erase (DSE)

See **DSE**.

data tape

A data cartridge formatted for use as a regular data tape for the system in which it is used.

data track(s)

The region(s) of recorded tape containing user data formed as discreet longitudinal "tracks" (similar to railroad tracks).

diagnostics

Pertaining to the detection and isolation of errors in programs and faults in equipment. (IBM)

DPKM

data path key management. The use of the SCSI 4 commands Security Protocol In and Security Protocol Out to implement host-based key management encryption on StorageTek tape drives.

drive

A device for moving magnetic tape and controlling its movement. (IBM)

DSE

data security erase. A random binary pattern, over-writing existing data, from the point of an Erase command, to the end-of-tape.

dump

To copy the contents of all or part of virtual storage to collect error information. (IBM)

emulation

The use of programming techniques and special machine features to permit a computing system to execute programs written for another system. (IBM)

encryption

The translation of data into a secret code. Encryption is one of the most effective ways to achieve data security. To read an encrypted file, you must have access to a special key or password that enables you to decipher it.

EOT

End of Tape.

erase

To remove data from a data medium, leaving the medium available for recording new data. (I) (A)

error

A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition. (I) (A)

ESD

Electrostatic Discharge.

fault symptom code (FSC)

See **FSC**.

FC

fibre channel. The National Committee for Information Technology Standards standard that defines an ultrahigh-speed, content-independent, multilevel data transmission interface that supports multiple protocols simultaneously. Fibre Channel supports connectivity to millions of devices over copper and/or fiber-optic physical media and provides the best characteristics of both networks and channels over diverse topologies.

fiber channel (FC)

See **FC**.

fiber optics

The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. (E)

fiber-optic cable

A cable made of ultrathin glass or silica fibers which can transmit data using pulses of laser light. Fiber-optic cables have several advantages over copper cables: they have much less signal loss; they allow information to be transmitted at higher speeds and over longer distances; they are not affected by external electrical noise; and they are better for transmissions which require security.

fibre channel

The National Committee for Information Technology Standards standard that defines an ultrahigh-speed, content-independent, multilevel data transmission interface that supports multiple protocols simultaneously. Fibre Channel supports connectivity to millions of devices over copper and/or fiber-optic physical media and provides the best characteristics of both networks and channels over diverse topologies.

fibre connection (FICON)

See **FICON**.

FICON

fibre connection. An ESA/390 and zSeries computer peripheral interface. The I/O interface uses ESA/390 and zSeries FICON protocols (FC-FS and FC-SB-2) over a Fibre Channel serial interface that configures units attached to a FICON-supported Fibre Channel communications fabric..

FICON channel

A channel having a Fibre Channel connection (FICON) channel-to-control-unit I/O interface that uses optical cables as a transmission medium.

file-protect

To prevent the erasure or overwriting of data stored on data cartridges.

FIPS

Federal Information Processing Standards.

FRU

Field Replaceable Unit.

FSC

Fault Symptom Code. A four-character hexadecimal code generated in response to an error to help isolate failures within the device.

FTP

Generic definition: File Transfer Protocol.

GB

One billion (109) bytes..

Gb

Gigabit, equal to 109 bits.

Gbps

Gigabits per second.

gigabyte (GB)

See **GB**.

hardware

All or part of the physical components of an information processing system, such as computers or peripheral devices. (T) (A)

hub

A Fibre Channel Arbitrated Loop switching device that allows multiple servers and targets, such as storage systems, to connect at a central point. A single hub configuration appears as a single loop.

indicator

A device that provides a visual or other indication of the existence of a defined state. (T)

interface

Hardware, software, or both, that links systems, programs, or devices. (IBM)

internet protocol (IP)

See IP.

internet protocol (IP) address

A four-byte value that identifies a device and makes it accessible through a network. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be from 0 to 255. For example, 129.80.145.23 could be an IP address.

IP

internet protocol. A protocol used to route data from its source to its destination in an Internet environment. (IBM)

internet protocol v4 (IPv4) address

A four-byte value that identifies a device and makes it accessible through a network. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be from 0 to 255. For example, 129.80.145.23 could be an IP address.

internet protocol v6 (IPv6) address

The next generation internet protocol. It provides a much larger address space than IPv4. This is based upon the definition of a 128-bit address - IPv4 used a 32-bit address. The IPv6 address format is eight fields of four hexadecimal characters separated by colons (for example, 2001:0db8:85a3:0000:0000:8a2e:037 0:7334).

library

A robotic system that stores, moves, mounts, and dismounts data cartridges that are used in data read or write operations.

Linear Tape-Open

A set of data format standards created to enable data interchange among tape drive produced by a consortium of manufacturers. With LTO standards, the tape cartridges are interchangeable among tape drive brands.

link

A physical connection (electrical or optical) between two nodes of a network.

magnetic tape

A tape with a magnetizable layer on which data can be stored. (T)

menu

A list of options displayed to the user by a data processing system, from which the user can select an action to be initiated. (T)

network

An arrangement of nodes and branches that connects data processing devices to one another through software and hardware links to facilitate information interchange.

offline

Neither controlled by, nor communicating with, a computer. (IBM)

For a tape drive, this indicates that the tape drive is communicating, but reading/writing of data cannot be sent.

online

Pertaining to the operation of a functional unit when under the direct control of the computer. (T)

For a tape drive, this indicates that the tape drive is communicating and all data can be sent.

performance

One of two major factors, together with facility, on which the total productivity of a system depends. Performance is largely determined by a combination of throughput, response time, and availability. (IBM)

read/write head

The data sensing and recording unit of a diskette magazine drive or tape drive. (IBM)

release

A distribution of a new product or new function and fixes for an existing product. (IBM)

R/W

Read/Write.

SDP

Service Delivery Platform.

submenu

A menu related to and reached from a main menu. (IBM)

subsystem

A system that is part of some larger system.

switch

In Fibre Channel technology, a device that connects Fibre Channel devices together in a fabric.

system

A combination of functionally interrelated interacting mechanical and electrical elements designed to work as a coherent entity.

T10000 Tape Drive (VOP)

A software application that allows a user to monitor and perform some operations on a tape drive.

tape

See **magnetic tape**.

tape cartridge

A container holding magnetic tape that can be processed without separating the tape from the container.

tape drive

A device for moving magnetic tape and controlling its movement. (T)

TCP/IP

Transmission Control Protocol/Internet Protocol. A set of communication protocols that support peer-to-peer connectivity functions for both local and wide area networks. (IBM)

transmission control protocol/internet protocol (TCP/IP)

See **TCP/IP**.

Ultrium

An LTO tape format optimized for high capacity and performance with outstanding reliability. The Ultrium tape format uses a single reel cartridge to maximize capacity.

VOLSER

volume serial number. An alphanumeric label that the host software uses to identify a volume. It attaches to the spine of a cartridge and is both human- and machine-readable. It is, usually 6 characters long and is both the paper label stuck on the back edge of the cartridge and in the VOLID label that is recorded, particularly by MVS systems, at the beginning of the media.

volume serial number (VOLSER)

See **VOLSER**.

wrap

A single pass of tape from either BOT to EOT or EOT to BOT with the head(s) in a fixed transverse location.

write-enabled

A setting on a data cartridge that allows data to be written on the tape.

write-protected

A setting on data cartridges that prevents data from being written on the tape. Reading data is still possible.

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