Formula Consultants

STAR
Library Manager
Product Description

Formula Consultants Incorporated

P.O. Box 544
Anaheim, California 92815

714/778-0123
714/778-6364 (Fax)

sales@formula.com
www.formula.com

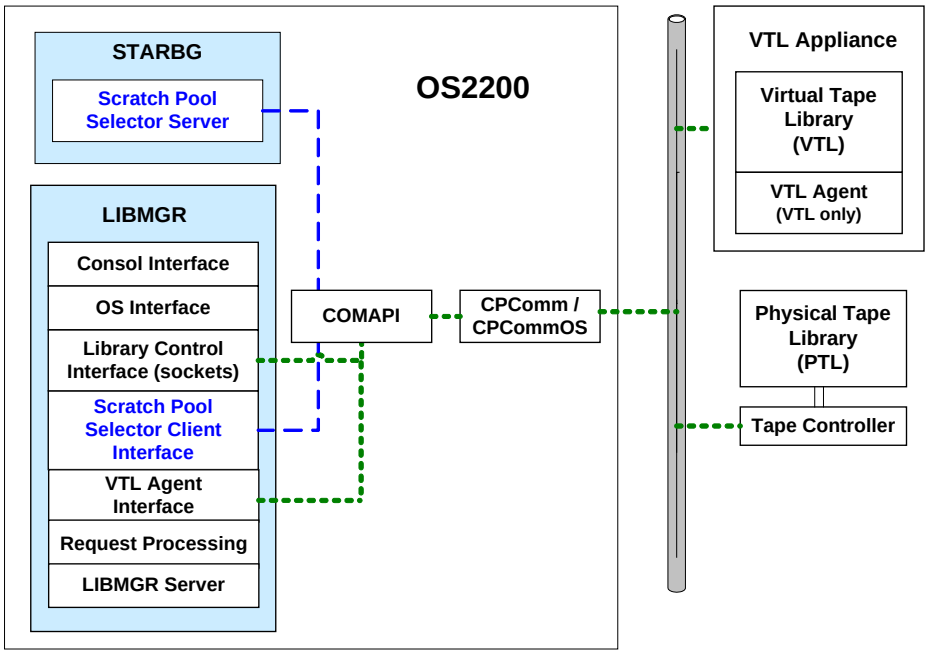
Highlights

STAR Library Manager enables the deployment of the DSI virtual tape library (VTL) and physical tape library (PTL) on Unisys OS 2200 systems. Library Manager detects when an OS 2200 user is requesting a tape in the DSI virtual or physical tape libraries, and satisfies requests for mounts, dismounts, and volume movement in those domains. Working with STAR-1100, it extends the protection and organization of tapes to the DSI products.

While it can be configured in sophisticated ways and supports a broad set of operational goals, it runs mostly unattended.

Release Status	Current release, Library Manager 2R1
Installation	Standard installation w/ COMUS and SOLAR
Prerequisites	STAR-1100 must be installed
Licensing	License separate from STAR-1100, some features have additional licenses
Protection for tape data	All virtual and physical tape library volumes are protected by STAR-1100 Synchronization of scratch statuses with STAR-1100 Tape Inventory File
Scratch pools	Supports named scratch pools in user tape @ASG
EXEC interface	Uses standard, supported Unisys API for tape unit allocation
User experience	Tape allocation unchanged, transparent to user
Scaling / configuration	Multiple virtual tape libraries supported per OS 2200 partition Multiple OS 2200 partitions can connect to a single virtual tape library
Advanced features	Tape replication to implement remote disaster sites Stacking contents of multiple volumes on a single virtual tape image System unstacking – to recover a stacked virtual volume to a physical tape
Other libraries	Works cooperatively with Oracle cartridge libraries

Core Library Manager Components



Library Manager Background Run (LIBMGR)

Library Manager operates as a background run, LIBMGR.

Console Interface

Operators issue commands to control LIBMGR via a console interface.

OS Interface

Library Manager interacts with a standard Unisys operating system interface, CARTTAPELIB$, to be informed of tape requests and to influence EXEC drive allocation for volumes in a DSI virtual tape or physical library.

Library Control Interface

Instructions for tape mounts, dismounts and other activity are sent to the DSI libraries in commands via iSCSI, an industry protocol for libraries.

Scratch Pool Selector Server Interface

When Library Manager detects a user request for a scratch volume, including a request for a named scratch pool, it calls the STAR Scratch Pool Selector Server to receive a volser matching the request.

VTL Agent Interface

Library Manager gathers status information from the DSI Virtual Tape Library by "talking" to the VTL Agent.

Request Processing

The Request Processing component provides logic for, and keeps track of, all the internal activities required to fulfill external user requests.

LIBMGR Server

The LIBMGR Server generalizes certain functions to fulfill requests from other modules within Library Manager.

Related External Systems

STAR-1100

Library Manager requires an active installation of STAR-1100.

STAR-1100 Scratch Pool Selector Server

STAR-1100 is aware of which tapes are in-use versus scratch, and organizes scratch tapes in pools. The Scratch Pool Selector Server provides Library Manager with a volser for the scratch pool matching the pool (or default) requested by Library Manager.

OS 2200 Communications Components

Library Manager uses COMAPI, CPComm and CPCommOS to manage communications traffic between it and external systems.

Virtual Tape Library Appliance

The "appliance" refers to the entire virtual tape library package: hardware and software. The appliance can host more than one virtual tape library.

Virtual Tape Library

The virtual tape library is a collection of controlling software and disk resources which contain a specific inventory of virtual volumes.

VTL Agent

The VTL Agent provides status information about the VTL.

Physical Tape Library

The DSI physical tape library can be connected to the appliance, or directly to the OS 2200 system.

Library Manager in Action

Library Manager is a library control program. It registers with CARTTAPELIB$, Unisys' standard external interface for tape allocation. CARTTAPELIB$ polls Library Manager, along with any other library control programs, seeking the optimal device allocation for a tape request, by matching equipment and media characteristics, and satisfying user-requested parameters.

When a user requests a specific volume, found in the VTL, Library Manager returns a list of candidate VTL-based drives to the EXEC for allocation. When the user requests a scratch tape, Library Manager first calls the Scratch Pool Selector Server in STAR-1100 to obtain an available scratch volume from a user-specified (or default) scratch pool. Library Manager then supplies a list of available drives in the VTL to the EXEC.

Library Manager communicates with the VTL across a TCP/IP network using the iSCSI protocol. iSCSI is an industry standard application protocol for operating remote libraries. Library Manager issues commands from the iSCSI "media mover" repertoire to accomplish virtual volume mounts, dismounts, etc.

CSC, the client software for the Oracle cartridge library is also a library control program. Library Manager is designed to operate in a setting where Oracle's automated cartridge libraries are also in use.

Tape librarians and administrators can use Library Manager utility programs for housekeeping tasks. Configurations and operational practices in Library Manager are closely integrated with those of STAR-1100. This ensures that tapes in a VTL or PTL are protected and organized. Librarians and administrators use familiar procedures to monitor and replenish scratch volumes in their appropriate pools, including in the VTL and/or PTL.

Library Manager is designed and implemented to be compatible with your site's existing tape operations. LIBMGR runs unattended while fulfilling its core purpose of mounting and dismounting tapes in the VTL and/or PTL. If operators need to interact with the LIBMGR run, they have a repertoire of commands they can issue via the system console.

Flexibility in Configurations

STAR Library Manager 2R1 Installation and Administrator Guide

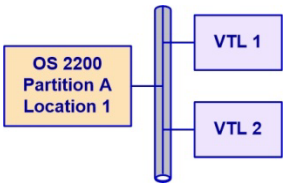
Section 2 “Hardware and Enterprise Considerations”

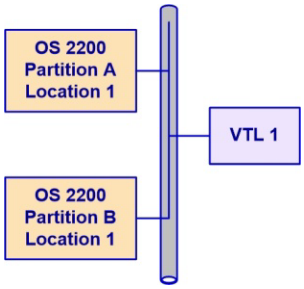
Section 3 “Installing and Configuring Library Manager”

The following diagrams provide highly simplified examples of the kinds of configurations possible. Configuration choices depend on the interaction of several requirements such as:

- departmental requirements for data privacy,
- isolating development and test resources from production,
- business continuance and disaster recovery goals.

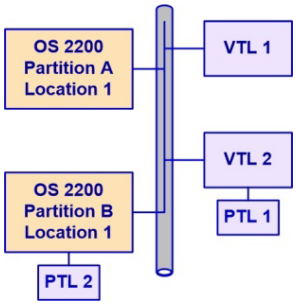
You can connect a single OS 2200 partition to multiple virtual tape libraries. These VTLs could be hosted in the same appliance, or in separate appliances.

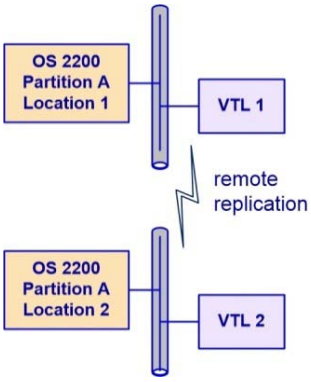




Multiple OS 2200 partitions can be connected to a single VTL.

A PTL (physical tape library) can be attached to a VTL appliance. In this arrangement, it may be used to export virtual volumes onto physical media. Or, the PTL can be configured as a library connected to the OS 2200 partition.





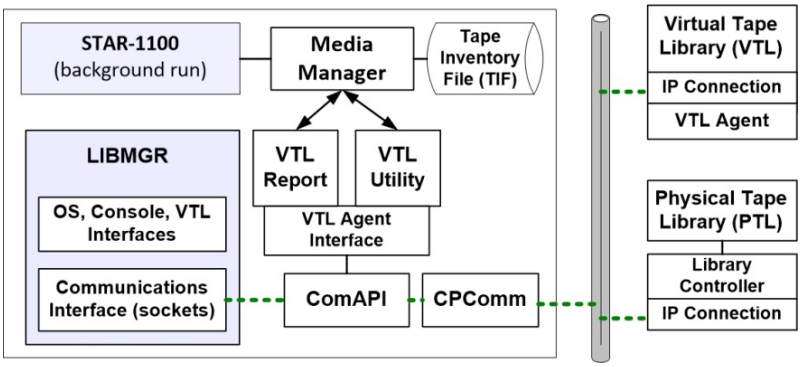
Using the remote replication feature of the VTL, administrators can establish a configuration to support disaster recovery.

Auxiliary Features

The core function of Library Manager is to intercept tape requests which are appropriate to be fulfilled in the DSI virtual or physical library, and to complete these requests accordingly.

Library Manager has additional, auxiliary features which can enhance productivity in the use of the virtual and physical tape library resources. See the diagram below.

Some of these features require separately priced licenses.



Reports

When tape librarians want a comprehensive picture of the tapes in the VTL, they can execute the VTL Report utility (shown above). The VTL Report obtains volume information from the STAR-1100 Tape Inventory File. It also obtains information from the VTL, provided by the VTL Agent. The data from these sources is merged into the VTL Report. Not shown in the diagram is a PTL Report, which provides information about volumes in physical tape library.

Note *In addition to generating reports from the utility program, operators can issue a* **REPORT** *command from the console. Options include a VTL Report, or a report for a library, a drive, or a volume. Outputs are in standard files.*

The VTL Utility

The VTL utility implements features for tape movement:

- moving volumes in and out of the vault,
- importing, and
- exporting.

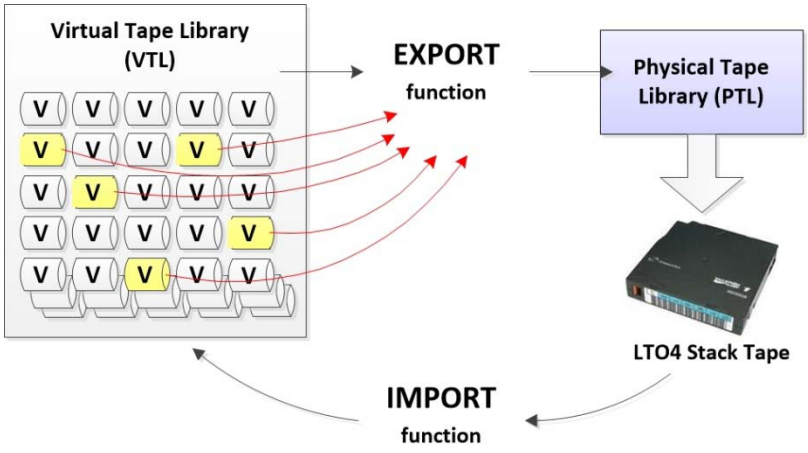
Note *Within STAR-1100, a vault is an off-site location for storing physical archive tapes. Within the VTL appliance, a vault is a virtual location. To perform certain virtual tape operations, such as Export, volumes must first be moved to the vault.*

Using Export for Physical Archives

The DSI virtual tape solution, in its inter-operation with STAR-1100 provides a high degree of protection to volumes within its sphere of control.

Your site may have additional standards and practices to satisfy the concerns of business continuance and disaster recovery. See the following topic about virtual tape replication. Individual departments may have their own policies for data archiving.

An additional level of data protection can be achieved by archiving virtual volumes onto physical media. The most practical way to do this is with a PTL (physical tape library) attached to the virtual tape appliance.



The VTL Utility implements an **EXPORT** feature where authorized operators or administrators can copy virtual tape volumes to a physical tape mounted in the PTL. Another term for this is "stacking" the virtual volumes onto the physical tape. Before exporting the volumes, the operator must use **VAULT** commands to move the volumes into the vault.

In a reciprocal function, archived data can be restored. An archive tape can be mounted in a PTL attached to a virtual tape appliance. Operators or administrators can perform an **IMPORT** function to copy the archived volumes into the VTL.

System Unstacking

As described above, normally a physical archive tape, created by an Export function in the VTL, is restored to a VTL. It might be a different VTL, but the restore process is placing the archived volumes back on a VTL.

There is an outage scenario in which the VTL appliance, and possibly the PTL, are out of service. Yet, the site has access to the physical archive volume. In this case, authorized operators and administrators can perform "system unstacking." The term "system" refers to the restore phase taking place on the OS 2200 system.

The key requirement is that the system must have a tape drive capable of reading the "stack tape" produced by the PTL in the Export process.

Replication

Replication is a powerful feature of the VTL. It can be used in a disaster recovery configuration. An organization can install a remote VTL appliance at the remote contingency site. Replication can be activated such that volumes written at the primary site are also written at the contingency site. Contact FCI for assistance in configuring this kind of solution.

Product Documentation

The STAR Library Manager documentation set:

- *STAR Library Manager 2R1 Release Announcement*
- *STAR Library Manager 2R1 Installation and Administrator Guide,* FP-161-2R1
- *STAR Library Manager 2R1 Quick Start Notes*
- *OS 2200 Release Tape Recreation Instructions*

For information about configuring scratch pools in STAR-1100, see:

- *STAR-1100 Installation Guide,* FP-102 R14

For additional insight into how STAR works, see:

- *STAR-1100 Operations Guide,* FP-103-R14

Contact DSI for the current documentation for the VTL and / or PTL.