



This Application Note describes the system requirements and procedure using the Logical Library™ feature for attaching two or more Windows NT 4.0 computers to a single Qualstar Tape Library System (TLS). This Application Note is applicable only to libraries with firmware 700105 Revision 2.02 or later. The SCSI adapters used in our testing were:

Model	Firmware
Adaptec AHA-2940UW	BIOS v1.32 aic78xx.sys

When multiple host computers are tied to the same library, all tape drives must be removed from the SCSI bus controlling the library. This splitting of control and data busses is a requirement of the application software and not the TLS or tape drives. Thus the installation of at least two SCSI host adapters in each NT hosts system is required. All hosts (SCSI initiators) share control of the library on a single SCSI bus. A separate SCSI bus connects each host to its exclusively assigned tape drives. Keeping the tape drives on separate busses dedicated to each application avoids contention problems between the applications and improves performance.

The NT SCSI drivers must be configured for multiple initiator operations, which requires configuring the BIOS and driver to avoid creating SCSI bus resets. A SCSI bus reset initiated by one host may confuse the other hosts. Next, the physical resources must be divided into logical library sets and a set must be assigned to each host application.

The remainder of this Application Note will illustrate an example of a two host NT system accessing a single TLS-4480 library equipped with four tape drives.

Installation and Cabling

Two SCSI host adapters are installed in each NT system. One SCSI adapter from each system plus the library's controller are connected together on a single SCSI bus. This allows each system to share control of the library. A separate SCSI bus connects each system to its assigned tape drives. A separate bus for the tape drives is needed to improve performance, and avoids SCSI bus conflicts noted with the Window NT SCSI tape drivers. Note the SCSI ID's of the adapters and the library's SCSI control interface (Medium-changer aka MC) as shown in Figure 1. Host 1 and Host 2 connect to their dedicated tape drives through separate SCSI host adapters.

Configure SCSI Adapters for Multiple Hosts

All SCSI adapters that share the common SCSI bus must be configured to avoid issuing SCSI bus resets and they must possess unique SCSI Ids. If these requirements cannot be met, then different adapters should be used. The specific instructions needed to configure your adapters are supplied by the board's vendor. The instructions provide in this application note are for the Adaptec AHA-2940UW.

The Adaptec AHA-2940UW SCSI adapters have a BIOS setup program. As the host is booting, the user is prompted to "**Press <Ctrl><A> for the SCSISelect™ Utility**". Using this utility, configure Host 1 SCSI adapter 1 for SCSI ID 6 as shown below. Host 2 can remain at the default SCSI ID value of 7.

Configuration

SCSI Bus Interface Definitions

Host Adapter SCSI ID .. 6

For Host 1 and Host 2, select the “Additional Options Advanced Configuration Options” to disable SCSI Bus reset at startup.

Configuration

Additional Options

Advanced Configuration Options

Reset SCSI Bus at IC Initialization .. Disabled

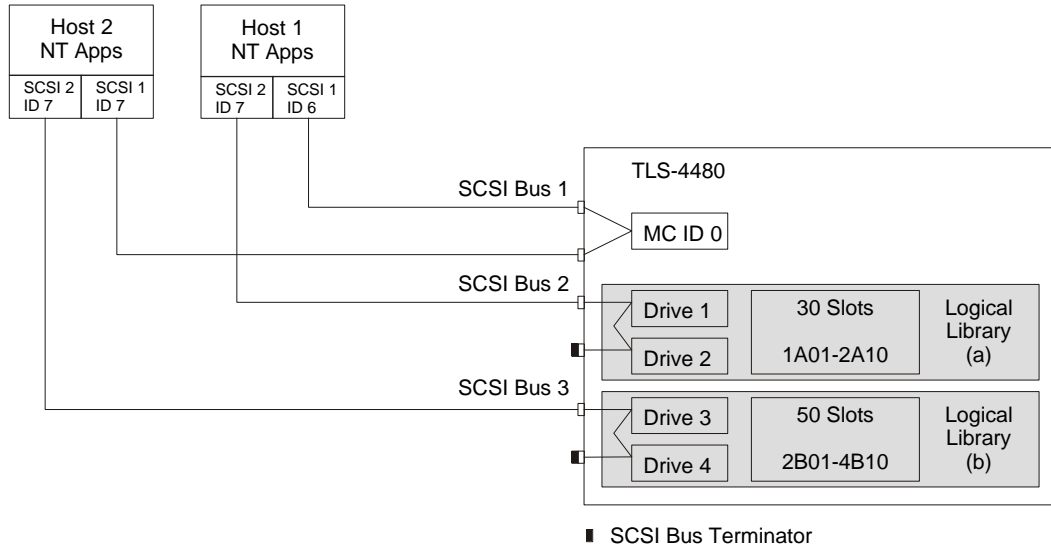


Figure 1

Logically Partitioning the Qualstar Tape Library System

A TLS-4480 defaults to a single library 'a', assigned tape drives D1 through D4 and 80 magazine slots, 1A01 through 4B10, and fixed slots F1 through F4 as shown in Figure 2.

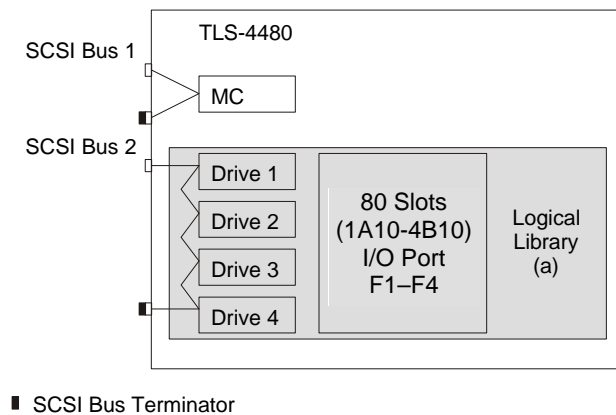
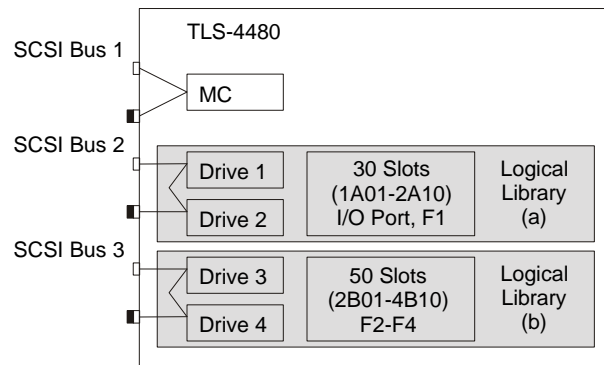


Figure 2

For this example (shown in Figure 3), the TLS-4480 is partitioned into two logical libraries, 'a' and 'b'. The first library 'a', is assigned tape drives D1 and D2 and the first 30 magazine slots, 1A01 through 2A10 and fixed slot F1. The second library 'b', is assigned tape drives D3 and D4 and the remaining 50 magazine slots, 2B01 through 4B10 and fixed slots F2 through F4. The I/O port may only be assigned to one logical library – library 'a' in our example.



■ SCSI Bus Terminator

Figure 3

Configure logical library 'a', with tape drives D1 and D2, the first 30 slots (1A01 through 2A10) and fixed slot F1. Navigate to the **Top Menu\Configuration\Advanced\Library a:** and set the values as follows:

```
C•Advanced•Library•a
Enable:          ON
Drive First:p..D1.
Drive Last: p..D2.
Drives:         2
Fixed First:p.F1..
Fixed Last: p.F1..
Fixeds:        1
I/O Port:       YES
Slot First: p.1A01
Slot Last:  p.2A10
Slots:         30
```

Configure logical library 'b', with tape drives D3 and D4, and the remaining 50 slots (2B01 through 4B10) and fixed slots F2 through F4. Navigate to the **Configuration\Advanced\Library b:** menu and set the values as follows:

```
C•Advanced•Library•b
Enable:          ON
Drive First:p..D3.
Drive Last: p..D4.
Drives:         2
Fixed First:p.F2..
Fixed Last: p.F4..
Fixeds:        3
I/O Port:       NO
Slot First: p.2B01
Slot Last:  p.4B10
Slots:         50
```



Each logical library must be assigned to a SCSI host (initiator). The library monitors the host SCSI target ID to determine the logical library context for commands and responses. TLS logical library 'a' is assigned the host with SCSI target ID 6. TLS logical library 'b' is assigned the host SCSI target ID 7. All the other initiator entries are left to
\Configuration\Advanced\SCSI\Library menu as shown below.

CA\SCSI\.....Library	
Initiator 0:	a
Initiator 1:	a
Initiator 2:	a
Initiator 3:	a
Initiator 4:	a
Initiator 5:	a
Initiator 6:	a
Initiator 7:	b
Initiator 8:	a
Initiator 9:	a
Initiator 10:	a
Initiator 11:	a
Initiator 12:	a
Initiator 13:	a
Initiator 14:	a
Initiator 15:	a

The TLS-4480 is now partitioned into two logical libraries, 'a' and 'b'. This completes the shared library installation example.

Considerations and Limitations

The PC BIOS and Windows NT 4.0 SCSI drivers are not well behaved during system startup. System initialization of the computer SCSI interface may conflict with other computers connected to the common SCSI bus. To minimize the possibility of contention, all host library operations should be stopped when starting or stopping a connected computer.

In our example, the host adapter boards provide active SCSI bus termination and must always be powered on to provide SCSI bus termination whenever the bus is in use. Since the two computers in our example both provide the SCSI bus termination on the two ends of a shared SCSI bus, they must be powered on together to insure the bus is terminated properly as the systems initialize their respective host adapter boards.

If a computer's SCSI connection is not at either end of the SCSI bus, the SCSI adapter's built-in terminators must be disabled.

The user's application also needs to be well behaved to work properly in a shared configuration. At times, the status of the library may be busy, since another application may have a command in progress. If an application assumes the library should always be available, a conflict may be interpreted as an error condition.

This feature may not operate successfully with some host architectures and applications. Qualstar always supports customers to the best of its abilities and resources, but the myriad combinations of systems, SCSI adapters and applications packages, make it impossible to assure operation in every case.