

DOCUMENT NOTE:

This Fibre Channel zoning document from 2007 is a Tandberg Data generated document in cooperation with Apple and the TOLIS Group engineering team.

TOLIS Group is providing this document as it describes the Zoning configurations that apply to all Fibre Channel Tape installations. While it was generated in 2007, and pictures included are old (such as the no longer available XServe etc...) it still applies today for how zoning with Fibre Channel devices work.

**For further questions please contact TOLIS Group support at:
<http://tolisgroup.com/support.html>**

Tandberg Data Solutions Brief



Apple Fibre Channel Integration Guide

TANDBERG DATA 
Securing your Information

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Introduction

Integrating Tandberg Data® Tape Libraries into Apple® XServe, XServe Raid Architecture

- This guide presents an overview of integrating Tandberg Data Fibre Channel Tape Library Hardware into Apple Fiber Channel Storage Area Networks. Common configurations are outlined as well as the parts required to build them.
- This guide also addresses some common challenges integrating Fibre Channel hardware solutions.

General Overview of parts and Accessories

Apple Fibre Channel Architecture Common Components

Data Protection Application



Apple Fibre Channel PCI-X Card



Optical SFP Transceiver Modules



Fiber Optic Cable - LC to LC



Copper Cable - SFP to SFP



Fibre Channel Switch



Tandberg Data
Magnum 224 LTO FC



Xserve G5



Xserve RAID



Tandberg Data
Magnum 448 LTO FC

Connect a Tandberg Data Fibre Channel Tape Library to a Host System and a Network.

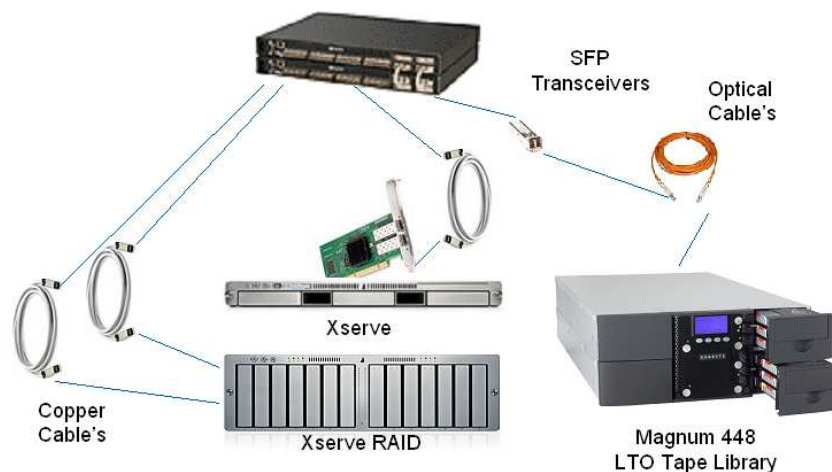
Hardware and Operating System Compatibility Requirements:

- Tandberg Data Fibre Channel Tape Libraries feature native Optical Fibre “LC” style connectors.
- Tandberg Data tape connection is 1Gb/s, 2Gb/s, and 4Gb/s auto negotiated speed and topology.
- Tandberg Data LTO-1 Tape Drive connection specification is FC-2 1Gb/s, Arbitrated Loop.
- Users may either establish communication to a host by connecting directly with the Fibre ports on a Fibre Channel Host Adapter or connect through a Fibre Channel Switch if more than two connections are required.
- Automatic negotiation of port speed and topology can be used where supported by initiators.
- Users may set initiator ports to match speed and topology of the connected devices.
- Auto negotiation of speed and topology is recommended.
- **Zoning Libraries and Tape drives to more than one (multi-path) host server port is not supported.**
- Tandberg Data Fibre Channel Tape Libraries are compatible with Xserve and Xserve RAID Systems. Mac OS X version 10.3.3 or later is required along with Apple Fibre Channel utility software.
- Only use Fibre Channel Components listed on the Apple Store or their equivalents. Verify compatible hardware by check the Apple Website: (www.apple.com).

To complete the tape library integration users must:

- Install the Fibre channel host bus adapter in a host server along with the associated software utilities.
- Use optical SFP Transceivers in the Fibre channel host adapter or switch supporting the tape product.
- Connect LC optical Fibre channel cables to each tape drive in the tape library.
- Connect the tape drives optical cables to the server Fibre channel card ports or the switch ports.
- Configure all port connections to their correct settings with their software other port management utilities.
- Connect the Tandberg Data tape library to a 10/100 Ethernet network for the library Remote Management feature.
- Connect a power cord to the tape Library. An uninterruptible power supply (UPS) is recommended.
- Power cycle the Fibre Channel switch if applicable. Power cycle all tape storage devices. Power cycle the host server. This correctly allows the Fiber channel layer and host to initialize communications to all devices.

Auto Negotiating Fiber Channel Switch



Fibre Channel Switched Fabric Model
Using a Multi Speed Switch

Common Supported Fibre Channel Configurations

Tape Library Configuration Directly Attached to the Host Server (No Switch)

Support For:

- Magnum Library with one or 2 LTO Tape Drives

Solution Topology:

- Tape Drives connect directly to the Server using an Apple Fibre Channel Card.
- Apple multi port Fibre Channel Cards may be used to support an Xserve RAID.

Purpose:

- This architecture provides a solution for a Library with one or two Tape Drive's. This would be typical for a small Xserve host with optional Xserve RAID and a tape Library altogether requiring 4 F/C ports, 2 for the RAID and 2 for the Tape Library if using 2 tape drives. Example shows the Apple Dual port Fibre Channel Card and one tape drive.

Checklist:

- Install one dual port Fibre Channel Adapters in the server for the library tape drives.
- Install Optical SFP Transceivers in the ports of the Fibre Channel Adapter for the tape drives.
- (optional) The Xserve RAID is connected with copper SFP cables to a second Fibre Channel Adapter. Alternatively a 4 port adapter may be used.
- Set the Server Fibre Channel Adapters to the Automatic Port Settings. Use the Fibre Channel Adapter Utility, and verify the settings with a server power cycle reset.
- Connect the Tape Drive to Port 0 of the Server Fibre Channel Adapter.
 - An LC to LC Optical Cable is required.
- Power sequencing of all the Fibre Channel components.
 - Power the Fibre Channel switch first.
 - Power all the storage devices including all RAID and Tape Libraries.
 - Power the host and allow the operating system to complete loading.
- Verify the devices are being communicated with by checking the Apple System Profiler.
- Setup the host software to control the Xserve RAID.
- Set



Tape Library Configuration in a Switched Fabric SAN

Support for:

- Tandberg Data Magnum Library with up to 2 Tape Drives
- **Auto Sensing Multi Speed** Fibre Channel Switch required.

Solution Topology SAN:

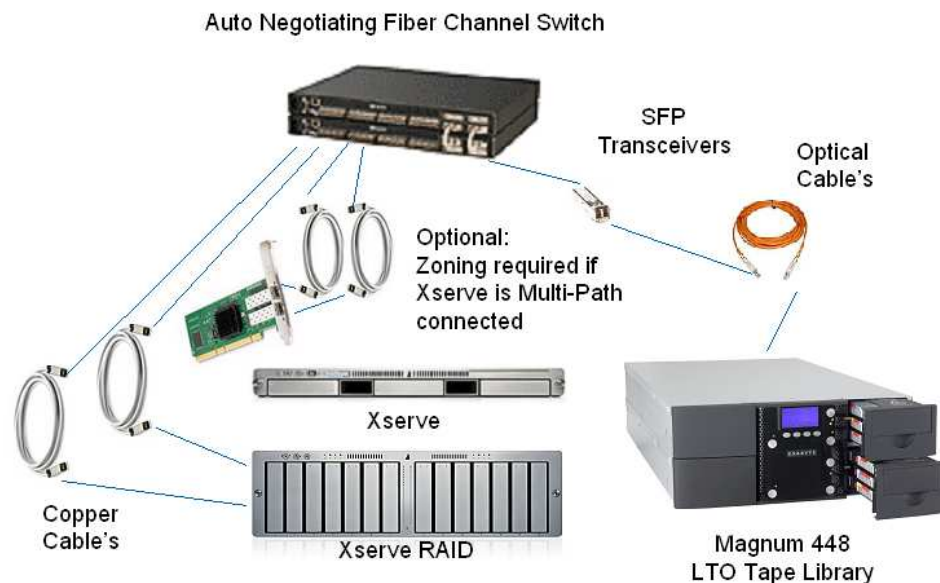
- The Fibre Channel Switch connects to the Host Server Fibre Channel Adapter.
- The Tape drives and RAID storage devices connect to the Fibre Channel Switch.

Purpose:

This architecture provides a solution for a requirement of more than two Fibre Channel Ports. The Fibre Channel Switch increases the number of devices that can connect to the Host. For Multi Drive Tape Libraries and RAID together on a single switch.

Checklist:

- A multi port Fibre Channel Adapter is installed in the Host Server.
- Set the Server Fibre Channel Adapters to the "Automatic" Port Settings. Use the Fibre Channel Adapter Utility, and verify the settings with a server power cycle reset.
 - Port 0 and 1, Set the speed to Auto Sense and topology Auto Sense.
- Connect the Fibre Channel Switch to Port 0 on the Host Server Fibre Channel Card.
 - SFP to SFP copper cable are acceptable.
 - Alternately, Qty 2 SFP Transceivers and an LC-LC cable may be used. (Optical)
 - Auto sense speed and topology port setting are recommended for the switch.
- Connect the Tape Drives in the Library to the Fibre Channel Switch any port.
 - SFP Transceivers must be installed in the Fibre Channel Switch.
 - An LC to LC Optical Cable is required.
- Power sequencing of all the Fibre Channel components.
 - Power the Fibre Channel switch first.
 - Power all the storage devices on the SAN including all RAID and Tape Libraries.
 - Power the host and allow the operating system to complete loading.

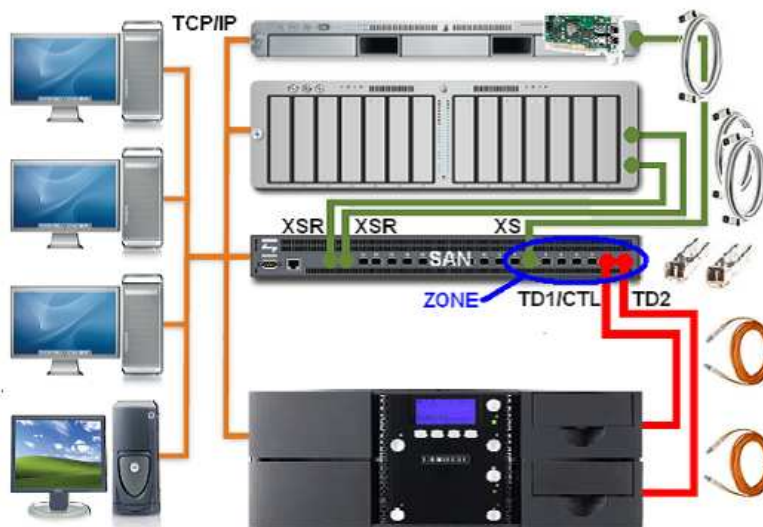


Fibre Channel Switched Fabric Model
Using a Multi Speed Switch

Multi Path Configuration Checklist:

- Host Multi Path option
 - If the backup server has 2 Fibre channel connections to the switch
 - An ACL Zone must be setup for the tape library to function properly.
 - Zone includes; **single host port and the relevant switch ports for the tape library.**
 - Zone by WWN recommended.

Best Practice; Zone the Tape and host (by port or WWN)



Troubleshooting Checklist

Power

- All tape libraries and other devices should be powered on before the host.
- The Fiber Channel Switch should be powered on first, if included with the topology, followed by the Tape Library, then by the Host.

Device Discovery

- Ensure All Host Adapter and Switch Link Light Status is correct for the connection. Refer to the HBA or Switch hardware guide for specifics.
- If a device discovery in System Profiler or software is not successful after a restart of the server than unplug and re-plug the missing device cable.
- Users can verify all link characteristics with the “ioreg” console command.
ioreg -w 0 -c AppleLSIFusionFC | grep "Controller Characteristics"
- Users can Monitor Fibre Channel Activity with the “tail” terminal command.
tail -f /var/log/systems.log

Troubleshooting Checklist Continued:

For All Topologies

- Always use HBA Port 0 for single Tape drives in direct attached setups.
- Always use HBA port 0 for connecting the switch serving the Library and Tape Drives.
- In direct attached configurations, setting the HBA to automatic speed and topology negotiation is supported.

Setup Recommendations

- Always use Port 0 for a single tape drive in a direct attached setup.
- Verify all link characteristics with the “ioreg” console command:

```
ioreg -w 0 -c AppleLSIFusionFC | grep "Controller Characteristics"
```

```
"Controller Characteristics" = {"Port
Number"=0,"Port Speed"="Automatic (2 Gigabit)","Port World Wide
Name"=<100000062b06c27c>,"Product Name"="LSI7202P","Vendor
Name"="LSILogic","Address Identifier"=<000a01>,"Fibre Channel Cabling
Type"="Fiber Optic","Product Revision Level"="Firmware 0.0.0, Fcode
1.00.29","Slot"="SLOT-C","Node World Wide
Name"=<200000062b06c27c>,"Port Topology"="Automatic (N_Port)","Port
Status"="Link Established"}
> | | | "Controller Characteristics" = {"Port
Number"=1,"Port Speed"="Automatic","Port World Wide
Name"=<100000062b06c27d>,"Product Name"="LSI7202P","Vendor
Name"="LSILogic","Product Revision Level"="Firmware 0.0.0, Fcode
1.00.29","Slot"="SLOT-C","Node World Wide
Name"=<200000062b06c27d>,"Port Topology"="Automatic","Port Status"="No
Link Established"}
```

Other Information

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REVISION HISTORY

August 2007