Veritas NetBackup™ Appliance Fibre Channel Guide

Release 3.1 and 3.1.1

NetBackup 52xx and 53xx

VERITAS™

Veritas NetBackup™ Appliance Fibre Channel Guide

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Contents

Chapter 1

About NetBackup Fibre Transport and SAN Client

This chapter includes the following topics:

About NetBackup Fibre Transport

NetBackup Fibre Transport is a method of data transfer. It uses Fibre Channel and a subset of the SCSI command protocol for data movement over a SAN rather than TCP/IP over a LAN. It provides a high-performance transport mechanism for the following scenarios:

- Backup and restore between NetBackup clients and NetBackup media servers
- Optimized duplication and Auto Image Replication between NetBackup media servers

See "About NetBackup SAN Client and Fibre Transport" on page 7.

See "About Fibre Transport for optimized duplication and Auto Image Replication between appliances" on page 10.

About NetBackup SAN Client and Fibre Transport

SAN Client is a NetBackup optional feature that provides high-speed backups and restores of NetBackup clients.

Note: If you plan to use the SAN Client feature with your appliance and you have SLES 10 clients with QLogic FC HBA cards, a driver update is required. Before you proceed with backups of any SLES 10 clients, Veritas recommends that you first upgrade the QLogic driver in all SLES 10 clients to version 8.03.07.03.10.3-k or later.

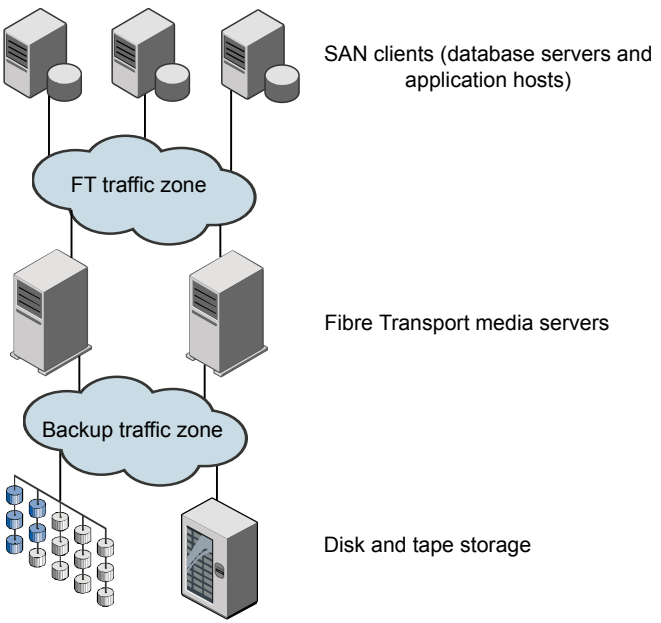
A SAN client is a special NetBackup client that can back up large amounts of data rapidly over a SAN connection rather than a LAN. For example, a database host can benefit from high-speed backups and restores. Fibre Transport is the name of the NetBackup high-speed data transport method that is part of the SAN Client feature.

The backup and restore traffic occurs over Fibre Channel (FC), and the NetBackup server and client administration traffic occurs over the LAN.

For a NetBackup 52xx or 53xx appliance, Fibre Transport also provides high-speed traffic to a NetBackup 5000 series appliance that supports Fibre Transport. The 5000 series appliance functions as the storage host for SAN client backups.

Figure 1-1 shows a SAN Client configuration.

Figure 1-1 A SAN Client configuration



For more information about SAN Client and Fibre Transport, see the *NetBackup SAN Client and Fibre Transport Guide* from the NetBackup Documentation set at the following link:

http://www.veritas.com/docs/DOC5332

See "About the SAN Client license key" on page 9.

See "About zoning the SAN for NetBackup appliances" on page 59.

See "About Fibre Transport paths for NetBackup appliances" on page 25.

About the SAN Client license key

On the NetBackup master server, enter the license that activates the SAN Client feature.

If the license expires or is unavailable (such as in a disaster recovery situation), backups and restores occur over the LAN.

Chapter 2

About optimized duplication and Auto Image Replication over FC

This chapter includes the following topics:

About Fibre Transport for optimized duplication and Auto Image Replication between appliances

For a NetBackup 52xx or 53xx appliance, Fibre Transport (FT) provides high-speed traffic to another NetBackup appliance that supports FT. The traffic can be for optimized duplication or Auto Image Replication.

For optimized duplication and Auto Image Replication over FT, the source and target appliance must be a NetBackup 52xx or 53xx appliance.

Note: On the NetBackup 52xx or 53xx appliances, the support for optimized duplication or Auto Image Replication over FT depends on the HBA configuration of each appliance.

See "Fibre Channel feature support with appliance HBA configurations" on page 20.

To use FT for optimized duplication and Auto Image Replication, you must complete different FT settings on the source and the target appliances.

- On the source appliance, you must enable FT for optimized duplication and replication to other appliances.

- On the target appliance, you must enable FT for use as the target for optimized duplication and replication. You can customize the port configuration on the source and the target appliance. Note that the target mode and ports are different than those for SAN Client Fibre Transport media server (FTMS).

Note: When you perform duplication or replication jobs from the NetBackup Administration Console, you can monitor the jobs by using the **Activity Monitor**. But in the **Detailed Status** tab, the **Transport Type** field always reports **LAN** for jobs over FC. To see the correct transport type, refer to the details in the **Status** box.

See "About Fibre Transport paths for NetBackup appliances" on page 25.

See "How to configure Fibre Transport for optimized duplication and Auto Image Replication over FC" on page 76.

See "About the factory default port mode configuration" on page 54.

See "Settings > Network > Fibre Transport" on page 66.

Chapter 3

About backup to tape support

This chapter includes the following topics:

About backup to tape support for NetBackup appliances

NetBackup appliances support backups to tape so that you can connect one or more tape libraries to them with Fibre Channel. The appliances use a Fibre Channel host bus adapter card (FC HBA) for connection to a TLD tape storage device.

If you use a tape library as storage, create a separate zone for that traffic. The tape storage zone should include the following FC HBA ports:

- A port or ports on the FC HBA card(s) of the appliance.
- A port or ports on the tape library.

See the following for how tape out is supported on FC HBA cards on each appliance hardware model.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

See "Supported Fibre Channel port configurations for the NetBackup 53xx appliances" on page 50.

For hardware compatibility list (HCL) for tape drives and tape libraries on the appliance, check the NetBackup hardware compatibility at the following link:

NetBackup Appliance Compatibility Notes

See “About Fibre Transport paths for NetBackup appliances” on page 25.

See “How to determine appliance HBA WWPNs” on page 59.

Chapter 4

VMware support

This chapter includes the following topics:

About NetBackup appliance as a VMware backup host

NetBackup appliance uses the VMware policy type to back up VMware virtual machines.

The following topics contain notes on the appliance as the backup host:

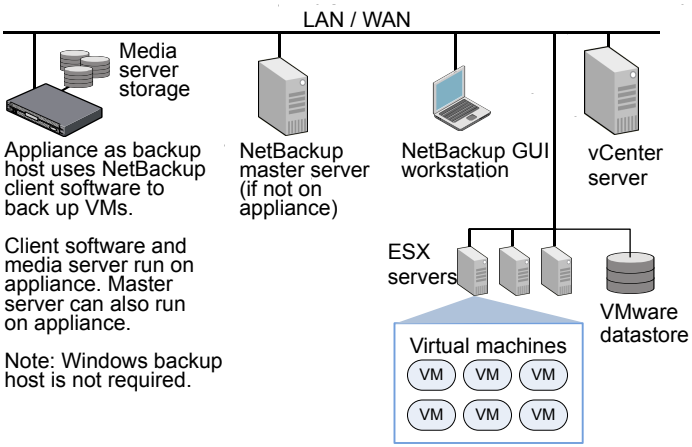
- For an overview of the appliance as backup host in a virtual environment:
  See "NetBackup appliance as backup host: component overview" on page 14.
- For a list of requirements and limitations:
  See "Notes on NetBackup appliance as a VMware backup host" on page 15.
- For further information, see the latest *NetBackup for VMware Administrator's Guide*:
  http://www.veritas.com/docs/DOC5332

NetBackup appliance as backup host: component overview

As Figure 4-1 shows, the appliance can operate as the VMware backup host. A separate Windows backup host is not required.

The appliance as backup host can also run the NetBackup media server and master server.

Figure 4-1 NetBackup for VMware with appliance as backup host



NetBackup appliances support dynamic multi-pathing (DMP) in a SAN environment:

See "About appliance dynamic multi-pathing for VMware backups with SAN transport" on page 15.

Further information is available on the appliance as backup host:

See "Notes on NetBackup appliance as a VMware backup host" on page 15.

Notes on NetBackup appliance as a VMware backup host

Note the following requirements and limitations for the appliance as the backup host:

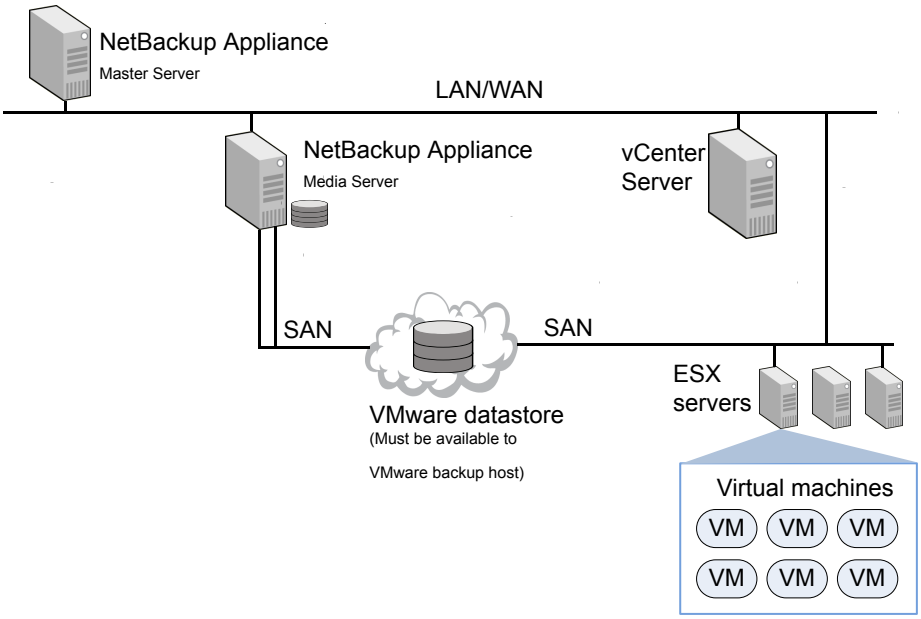
- The appliance must be version 2.5 or later.
- You must use the VMware policy type.
- The appliance supports iSCSI connections. Refer to the *NetBackup Appliance iSCSI Guide* for more information.

About appliance dynamic multi-pathing for VMware backups with SAN transport

NetBackup appliances support dynamic multi-pathing (DMP) in a SAN environment for VMware backups. DMP enhances I/O performance by distributing requests across all available paths. DMP on the Appliance can distinguish between the active paths and passive paths and make use of the active paths.

In a failover scenario, inputs and outputs are rerouted to healthy data paths. The failed paths are restored automatically when they become healthy. DMP also reduces the complexity of managing thousands of I/O paths in case they need to be temporarily disabled for array maintenance.

Figure 4-2 NetBackup appliance components for DMP on SAN



For more information on whether your system supports this function, see the *Hardware Compatibility List* at the following link:

http://www.veritas.com/docs/000019707

See "Notes on NetBackup appliance as a VMware backup host" on page 15.

See the NetBackup VMware Guide for more information about VMware.

Chapter 5

Supported Fibre Channel features on NetBackup appliances

This chapter includes the following topics:

About supported Fibre Channel features on NetBackup appliances

The appliances are rack-mount servers that run on the Linux operating system. NetBackup Enterprise Server software is already installed and configured to work with the operating system, the disk storage units, and the robotic tape device.

To use the NetBackup Enterprise Server software on the NetBackup appliance with the supported Fibre Channel (FC) features, you must configure the appliance FC settings first.

The NetBackup 52xx and 53xx appliances support the use of FC with some or all of the following features depending on hardware configuration:

- SAN Client
- Optimized duplication

- Auto Image Replication
- NetBackup for VMware
- Tape out

Note: NetBackup appliance supports the use of the DD Boost plug-in and its capabilities.

SAN Client

This feature provides high-speed backups and restores of NetBackup clients. A SAN client is a special NetBackup client that can back up large amounts of data rapidly over a SAN connection rather than a LAN. The backup and restore traffic occurs over FC, and the NetBackup server and client administration traffic occurs over the LAN.

You must enable the Fibre Transport media server (FTMS) feature on the NetBackup 52xx or 53xx appliance to use it for backing up SAN clients.

See "How to configure Fibre Transport media server for SAN Client" on page 71.

Optimized duplication

Note: Optimized duplication over FC is only supported with NetBackup appliance products, and not supported with non-appliance NetBackup servers.

Optimized duplication copies the deduplicated backup images between appliances within the same domain.

For optimized duplication over FC, the duplication source must be a NetBackup 52xx or 53xx appliance. The duplication destination can be a NetBackup 52xx or 53xx appliance.

The source and the destination must use the same NetBackup master server. The optimized duplication operation is more efficient than normal duplication because only the unique, deduplicated data segments are transferred. Optimized duplication reduces the amount of data transmission over your network and is a good method to copy your backup images off-site for disaster recovery.

You must configure appliances at both the source and the destination for optimized duplication over FC.

See "How to configure Fibre Transport for optimized duplication and Auto Image Replication over FC" on page 76.

Note: In the **Activity Monitor** from the NetBackup Administration Console, the **Transport Type** field in the **Detailed Status** tab always reports **LAN** for duplication jobs over FC. To see the correct transport type, refer to the details in the **Status** box.

Auto Image Replication

Note: Auto Image Replication over FC is only supported with NetBackup appliance products, and not supported with non-appliance NetBackup servers.

The backups that are generated in one NetBackup domain can be replicated to storage in one or more target NetBackup domains. This process is referred to as Auto Image Replication.

You must configure appliances at both the source and the destination for Auto Image Replication over FC.

You can use a NetBackup 52xx or 53xx appliance as the replication destination.

See "How to configure Fibre Transport for optimized duplication and Auto Image Replication over FC" on page 76.

For information about Auto Image Replication, see the *NetBackup Deduplication Guide*.

Note: In the **Activity Monitor** from the NetBackup Administration Console, the **Transport Type** field in the **Detailed Status** tab always reports **LAN** for duplication jobs over FC. To see the correct transport type, refer to the details in the **Status** box.

NetBackup for VMware

This feature provides backup and restore of the VMware virtual machines that run on VMware ESX servers. NetBackup for VMware takes advantage of VMware vStorage APIs for data protection. The backup process is off-loaded from the ESX server to a VMware backup host.

Starting with NetBackup 52xx and 5330 appliance software version 2.5, you can use the appliance as a VMware backup host. Earlier software versions required a separate Windows system as the host.

For information about how to configure a NetBackup 52xx or 53xx as a VMware backup host, refer to the following topics:

See "About NetBackup appliance as a VMware backup host" on page 14.

See "Notes on NetBackup appliance as a VMware backup host" on page 15.

For complete details about NetBackup for VMware and how to configure VMware policies, see the *NetBackup for VMware Administrator's Guide*.

Tape out

NetBackup appliance supports backups to tape so that you can connect one or more tape libraries to them with FC. An FC host bus adapter (HBA) provides for connection to a TLD tape storage device.

For information about how to configure a NetBackup 52xx or 53xx for backups to tape, refer to the following topic:

See "About backup to tape support for NetBackup appliances" on page 12.

See "Fibre Channel feature support with appliance HBA configurations" on page 20.

Fibre Channel feature support with appliance HBA configurations

Fibre Channel (FC) feature support depends on the particular HBA configuration of each appliance. This section describes what FC features are supported with different appliance HBA configurations.

Table 5-1 Supported FC features on NetBackup 5230 appliance

Configuration	Supported FC features
5220 A	Not supported
5220 B	■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5220 C	■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5220 D	■ SAN Client ■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware

Table 5-1 Supported FC features on NetBackup 5230 appliance *(continued)*

Configuration	Supported FC features
5220 E	■ SAN Client ■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware

Table 5-2 Supported FC features on NetBackup 5230 appliance

Configuration	Supported FC features
5330 A	Not supported
5330 B	■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5330 C	■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5330 D	■ SAN Client ■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5330 E	■ SAN Client ■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware

Table 5-3 Supported FC features on NetBackup 5240 appliance

Configuration	Supported FC features
5240 A	Not supported

Table 5-3 Supported FC features on NetBackup 5240 appliance *(continued)*

Configuration	Supported FC features
5240 B	■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 C	■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 D	■ SAN Client ■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 E	■ SAN Client ■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 F	■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 G	■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 H	■ SAN Client ■ Optimized duplication (Only as a source appliance) ■ Auto Image Replication (Only as a source appliance) ■ Tape out ■ NetBackup for VMware **Note:** This configuration cannot be used as a target appliance for optimized duplication or Auto Image Replication over FC.

Table 5-3 Supported FC features on NetBackup 5240 appliance *(continued)*

Configuration	Supported FC features
5240 J	Not supported
5240 K	■ SAN Client ■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
5240 L	■ Optimized duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware

Table 5-4 Supported FC features on NetBackup 53xx appliance

Configuration	Supported FC features
53xx A	Not supported
53xx B	■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware
53xx C	■ SAN Client ■ Optimized Duplication (Only as a source appliance) ■ Auto Image Replication (Only as a source appliance) ■ Tape out ■ NetBackup for VMware **Note:** This configuration cannot be used as a target appliance for optimized duplication or Auto Image Replication over FC.
53xx D	■ SAN Client ■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware

Table 5-4 Supported FC features on NetBackup 53xx appliance *(continued)*

Configuration	Supported FC features
53xx E	■ SAN Client ■ Optimized Duplication ■ Auto Image Replication ■ Tape out ■ NetBackup for VMware

If you do not know what HBA configuration you have on the appliance model, refer to the following topics for the appliance rear panel configuration:

See "About the NetBackup 5230 rear panel configurations" on page 29.

See "NetBackup 5240 Appliance I/O configuration options" on page 31.

See "NetBackup 5330 Appliance compute node PCIe slot I/O configuration options" on page 33.

Supported data transfer methods for NetBackup appliances

Table 5-5 describes the supported data transfer methods between NetBackup appliances. Specifically, NetBackup appliance models 5220, 5230, 5240, 5330 or 5340. The information includes whether the supported method uses Fibre Channel (FC) or TCP/IP.

Note: The supported methods over TCP/IP are also supported with non-appliance NetBackup servers. But optimized duplication and Auto Image Replication over FC are only supported withNetBackup appliance products. Depending on the HBA configuration, some appliances cannot be used as the target appliance for optimized duplication and Auto Image Replication.

Table 5-5 Supported data transfer methods for NetBackup appliances

Method	Source	Target	Operation
FC	52xx/53xx	52xx/53xx	Optimized duplication
FC	52xx/53xx	52xx/53xx	Auto Image Replication
FC	SAN Client	52xx/53xx	Media server deduplication
TCP/IP	52xx/53xx	52xx/53xx	Optimized duplication

Table 5-5 Supported data transfer methods for NetBackup appliances *(continued)*

Method	Source	Target	Operation
TCP/IP	52xx/53xx	52xx/53xx	Auto Image Replication

Table 5-6 describes the unsupported data transfer methods for NetBackup Deduplication and NetBackup appliances.

Table 5-6 Unsupported data transfer methods for NetBackup appliances

Method	Source	Target	Operation
FC	SAN Client	52xx/53xx	Client-side deduplication

See "About supported Fibre Channel features on NetBackup appliances" on page 17.

See "About the NetBackup 5230 rear panel configurations" on page 29.

See "NetBackup 5330 Appliance compute node PCIe slot I/O configuration options" on page 33.

See "NetBackup 5240 Appliance I/O configuration options" on page 31.

About Fibre Transport paths for NetBackup appliances

Table 5-7 shows the backup, restore, and duplication paths for NetBackup Fibre Transport (FT) for NetBackup appliances. It also shows the FT settings from the NetBackup Appliance Web Console that enable a functionality.

FT requires the following appliance software versions:

- NetBackup 52xx and 53xx appliances must use software version 2.7.3 and later on both the source host and the target host to duplicate data.

Table 5-7 Appliance Fibre Transport targets

Function	From	To
Backups	NetBackup SAN client.	NetBackup 52xx or 53xx appliance. The appliance is the backup server and the storage host.

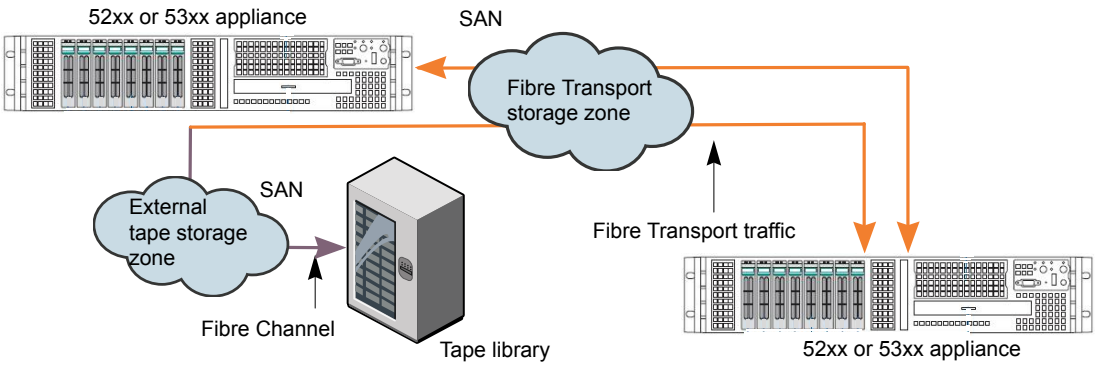
Table 5-7 Appliance Fibre Transport targets *(continued)*

Function	From	To
Restores	NetBackup 52xx or 53xx appliance. The appliance is the restore server and the storage host.	NetBackup SAN client.
Duplication	NetBackup 52xx or 53xx appliance.	NetBackup 52xx or 53xx appliance.

About appliance duplication paths

Figure 5-1 shows the duplication paths from a 52xx or 53xx appliance to another NetBackup 52xx or 53xx appliance.

Figure 5-1 Appliance duplication paths between 52xx or 53xx appliances



The following items describe the Fibre Transport path for duplication:

- Duplication from the 52xx or 53xx appliance over FT to the other 52xx or 53xx appliance.
  The duplication source and destination must both be MSDP. The operation is optimized duplication and only the unique deduplicated segments are transferred.

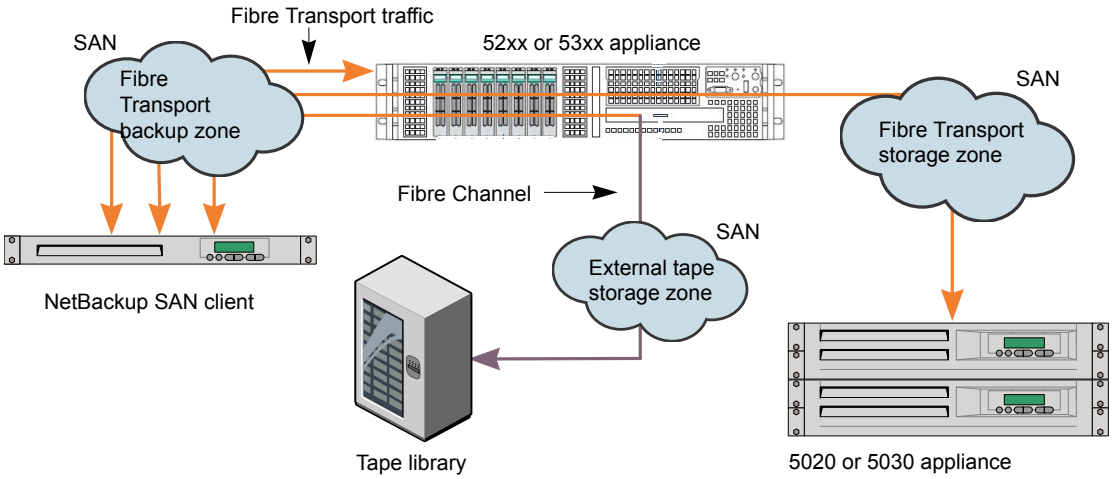
The following describes the resiliency available for FT jobs:

- Multiple FT paths can exist between hosts.
- Back up, restore, and duplication jobs failover to other FT paths if they exist. If no other FT paths are available, jobs fail.
- Optimized duplication jobs failover to other FT paths if they exist. If no other FT paths are available, they failover to the Ethernet network. If no FT connection or IP connection exists, optimized duplication jobs fail.
- If no FT connections exist, NetBackup uses an IP connection for new jobs.

About SAN client backup and restore paths

Figure 5-2 shows the possible backup and restore paths for a NetBackup SAN client.

Figure 5-2 SAN client backup and restore paths



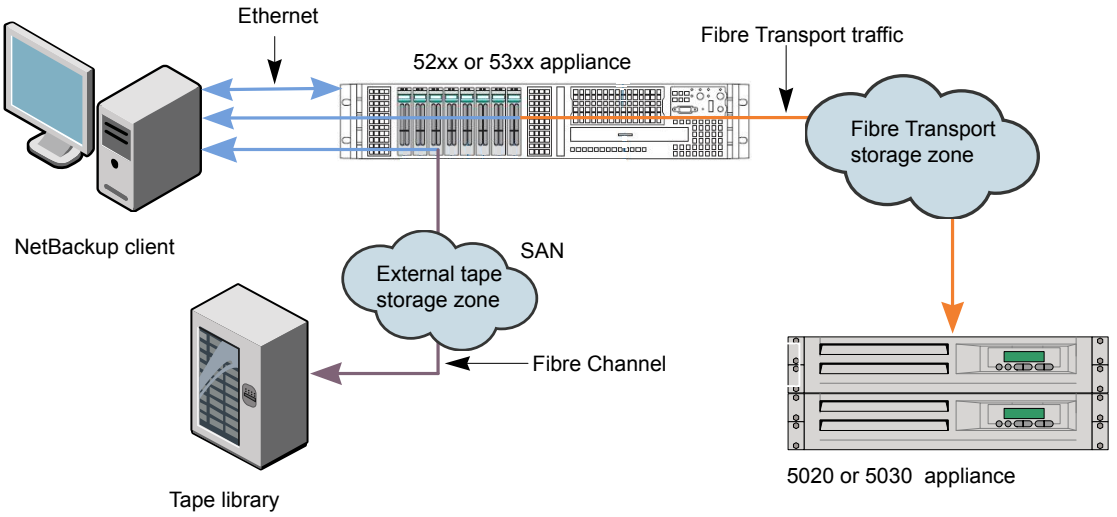
The following items describe the paths in Figure 5-2:

- FT between the client and the 52xx or 53xx appliance. The backups reside on disk storage on the appliance. You can use FT both for backups to deduplication storage and backups to AdvancedDisk storage.
- FT between the client and a 52xx or 53xx appliance, and then FC between the appliance and the tape library. The traffic travels through two different SAN zones. The backups are not deduplicated.

About LAN client backup and restore paths

Figure 5-3 shows the possible backup and restore paths for a NetBackup client over a LAN.

Figure 5-3 LAN client backup and restore paths



The following items describe the paths in Figure 5-3:

- Ethernet between the client and the 52xx or 53xx appliance. The backups reside on either deduplicated storage or AdvancedDisk storage on the appliance.
- Ethernet between the client and the 52xx or 53xx appliance, and then FC between the appliance and the tape library. The backups are not deduplicated.

See "About Fibre Transport for optimized duplication and Auto Image Replication between appliances" on page 10.

See "About the SAN Client license key" on page 9.

See "How to determine appliance HBA WWPNs" on page 59.

See "About backup to tape support for NetBackup appliances" on page 12.

Chapter 6

NetBackup Appliance rear panel configurations

This chapter includes the following topics:

About the NetBackup 5230 rear panel configurations

The NetBackup 5230 appliance ships in the following configurations. The external storage shelves can be ordered as separate devices.

Table 6-1 NetBackup 5230 rear panel configurations

Configuration	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
A	Not populated	Not populated	Not populated	Not populated	Not populated	Not populated
B	Not populated	Not populated	Not populated	Dual 8 Gb Fibre Channel	Not populated	Not populated
C	Not populated	Not populated	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Not populated	Not populated

Table 6-1 NetBackup 5230 rear panel configurations *(continued)*

Configuration	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
D	Not populated	Dual 8 Gb Fibre Channel	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel
E	Not populated	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel
A (with an external storage shelf)	SAS RAID controller	Not populated	Not populated	Not populated	Not populated	Not populated
B (with an external storage shelf)	SAS RAID controller	Not populated	Not populated	Dual 8 Gb Fibre Channel	Not populated	Not populated
C (with an external storage shelf)	SAS RAID controller	Not populated	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Not populated	Not populated
D (with an external storage shelf)	SAS RAID controller	Dual 8 Gb Fibre Channel	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel
E (with an external storage shelf)	SAS RAID controller	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel

Configuration D notes:

- You can use the FC ports in slots 2 and 4 for VMware, Optimized Deduplication over FC, or tape library connectivity. Both ports on each card are configured in Initiator mode.
- You can use the FC ports in slots 5 and 6 for Fibre Transport media server (FTMS) support.

- Understand that port 1 on the FC HBA cards in slots 5 and 6 is configured in Target mode. The other port on these cards is configured in Initiator mode.

Configuration E notes:

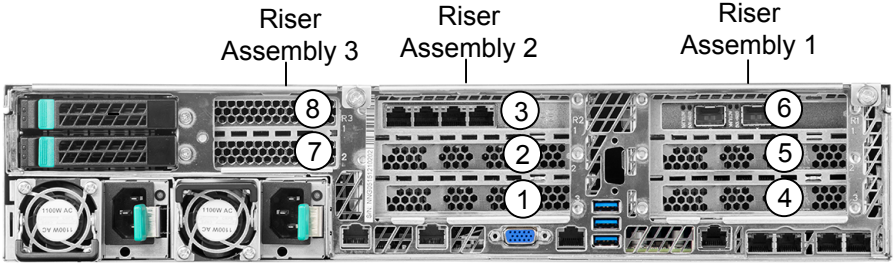
- You can use the FC ports in slots 2, 3, and 4 for VMware, Optimized Deduplication over FC, or tape library connectivity. Both ports on each card are configured in Initiator mode.
- You can use the FC ports in slots 5 and 6 for Fibre Transport media server (FTMS) support.
- Understand that port 1 on the FC HBA cards in slots 5 and 6 is configured in Target mode. The other port on these cards is configured in Initiator mode.

For complete information about FC HBA card usage, see the *NetBackup Appliance Fibre Channel Guide*.

NetBackup 5240 Appliance I/O configuration options

The rear panel of the NetBackup 5240 Appliance contains three PCIe riser card assemblies. PCIe riser card assemblies 1 and 2 each support three standard PCIe cards, while PCIe riser card assembly 3 supports two low profile PCIe cards. The slots are labeled 1 to 8. Slots 1, 2, and 3 are located in PCIe riser card assembly 2. Slots 4, 5, and 6 are located in PCIe riser card assembly 1, while slots 7 and 8 are located in PCIe riser card assembly 3.

Figure 6-1 Rear panel riser assembly locations and PCIe slot assignments (example: Configuration F)



The NetBackup 5240 Appliance supports multiple PCIe-based I/O configuration options. The following table shows the different I/O configuration options that are available.

Table 6-2 Available NetBackup 5240 Appliance PCIe-based I/O configuration options

I/O configuration option	Slot 1 *	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7 **	Slot 8 ***
A	-	-	-	-	-	-	-	-
B	-	-	-	-	-	8Gb FC HBA [3]	-	-
C	-	-	10GbE NIC [1, 3,]	-	-	8Gb FC HBA [3]	-	-
D ****	-	8Gb FC HBA [3]	10GbE NIC [1, 3]	8Gb FC HBA [3]	8Gb FC HBA [3]	8Gb FC HBA [3]	-	-
E ****	-	8Gb FC HBA [3]	8Gb FC HBA [3]	8Gb FC HBA [3]	8Gb FC HBA [3]	8Gb FC HBA [3]	-	-
F	-	-	1GbE NIC [2] (4 port - RJ45)	-	-	8Gb FC HBA [3]	-	-
G †	-	10GbE NIC [1, 3,]	10GbE NIC [1, 3,]	-	10GbE NIC [1, 3]	8Gb FC HBA [3]	-	-
H ****	-	10GbE NIC [1, 3,] (iSCSI capable)	10GbE NIC [1, 3]	-	8Gb FC HBA [3]	8Gb FC HBA [3]	-	-
J	-	-	10GbE NIC [1, 3,]	-	-	-	-	-
K ****	-	10GbE NIC [1, 3,]	10GbE NIC [1, 3,]	8Gb FC HBA [3]	8Gb FC HBA [3]	8Gb FC HBA [3]	-	-
L	-	10GbE NIC [1, 3,]	1GbE NIC [2] (4 port - RJ45)	-	-	8Gb FC HBA [3]	-	-

Table 6-2 Available NetBackup 5240 Appliance PCIe-based I/O configuration options *(continued)*

I/O configuration option	Slot 1 *	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7 **	Slot 8 ***

* Slot 1 contains a factory installed PCIe RAID 6 controller when at least one Veritas 2U12 49TB Storage Shelf is purchased with the NetBackup 5240 Appliance. Otherwise, slot 1 is not populated and is reserved for future use.

** Slot 7 contains the NetBackup 5240 Appliance's internal PCIe raid controller. This RAID controller is used to create the RAID 1 Array for the disk drives on which the appliance operating system is installed. The operating system disk drives are located in slots 0 and 1 of the front panel.

*** Slot 8 is reserved for the optional SAS tape-out adapter, which is used to connect external SAS devices to the NetBackup 5240 Appliance.

PCIe card cable connection types:

[1] Direct-Attach copper cable (also called a Twinaxial cable or Twinax)

[2] Standard copper cable

[3] Fiber optic cable

**** I/O configuration option notes:

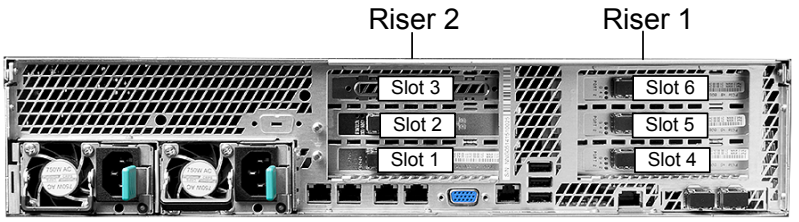
- A NetBackup 5240 Appliance using configuration H does not support Fibre Channel Replication (FCR) as a Target.
- A NetBackup 5240 Appliance using configurations D, E, H, K, P, R, V, and W can be configured as a dual port or as a quad port Fibre Transport Media Server (FTMS) server.

  You can use the Initiator ports for tape-out operations and VMware Datastores in the following scenarios:
  - If you do not configure the appliance as an FTMS server.
  - If you configure the appliance as a dual port FTMS server.

  You can also use the ports as a Fibre Channel Replication Initiator, or in combination with the previously mentioned uses.

NetBackup 5330 Appliance compute node PCIe slot I/O configuration options

The rear panel of the NetBackup 5330 Appliance compute node contains six PCIe slots that are numbered 1 to 6. Slots 1, 2, and 3 are located in PCIe Riser Assembly 2. Slots 4, 5, and 6 are located in PCIe Riser Assembly 1.



All PCIe slots are populated with an 8 Gb Fibre Channel (FC) host bus adapter (HBA) card or a 10 Gb Ethernet network interface card (NIC). Slots 1 and 4 are reserved exclusively for attachment to the Primary Storage Shelf.

For complete information about FC HBA card usage, see the *NetBackup Appliance Fibre Channel Guide*.

Table 6-3 describes the default PCIe slot I/O configuration options for the NetBackup 5330 Appliance.

Note: A NetBackup appliance high availability (HA) configuration must use two identical appliances with regard to model number and hardware configuration.

For example, use two model 5330 appliances with configuration D. You cannot use one model 5330 appliance with configuration D and one model 5340 appliance with configuration D.

This requirement applies to all of the I/O configurations for each model.

Table 6-3 Available PCIe slot I/O configuration options for the NetBackup 5330 Appliance compute node

I/O configuration option	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
A	8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	10 GbE NIC	10 GbE NIC
B	8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	10 GbE NIC	8 Gb FC HBA
C	8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA
D	8 Gb FC HBA	8 Gb FC HBA	10 GbE NIC	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA

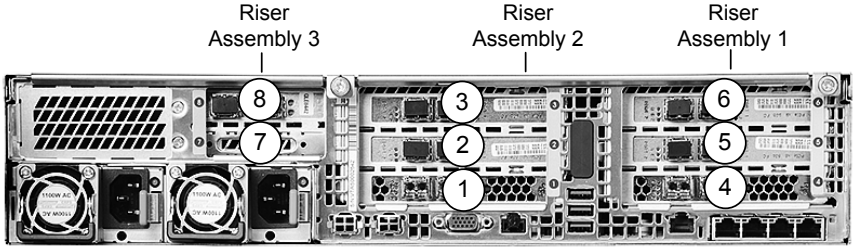
Table 6-3 Available PCIe slot I/O configuration options for the NetBackup 5330 Appliance compute node *(continued)*

I/O configuration option	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
E	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA

Available 5340 Appliance PCIe-based I/O configurations

The rear panel of the Veritas NetBackup contains three PCIe riser card assemblies. PCIe riser card assemblies 1 and 2 each support three standard PCIe cards, while PCIe riser card assembly 3 supports two low profile PCIe cards. The slots are labeled 1 to 8. Slots 1, 2, and 3 are located in PCIe riser card assembly 2. Slots 4, 5, and 6 are located in PCIe riser card assembly 1, while slots 7 and 8 are located in PCIe riser card assembly 3.

Figure 6-2 5340 Appliance rear panel riser assembly locations and PCIe slot number assignments



The 5340 Appliance supports multiple PCIe-based I/O configurations. The following table shows the standard I/O configurations that are available with a 5340 Appliance.

Note: A 5340 Appliance high availability (HA) configuration must use two identical 5340 compute nodes with regard to model number and hardware configuration.

For example, you can use two 5340 compute nodes with configuration D. However, you cannot use one 5340 Appliance compute node with configuration D and one 5340 Appliance compute node with configuration B.

This requirement applies to all of the I/O configurations for each model.

Table 6-4 Available 5340 Appliance PCIe-based I/O configurations

I/O configuration option	Slot 1 *	Slot 2	Slot 3	Slot 4 *	Slot 5	Slot 6	Slot 7	Slot 8
A †	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
B ††	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2562 8Gb FC HBA [3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
C ††	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2562 8Gb FC HBA [3]	QLogic QLE2562 8Gb FC HBA [3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
D ††	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2562 8Gb FC HBA [3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2562 8Gb FC HBA [3]	QLogic QLE2562 8Gb FC HBA [3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
E ††	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2562 8Gb FC HBA [3]	QLogic QLE2562 8Gb FC HBA [3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2562 8Gb FC HBA [3]	QLogic QLE2562 8Gb FC HBA [3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)

Table 6-4 Available 5340 Appliance PCIe-based I/O configurations *(continued)*

I/O configuration option	Slot 1 *	Slot 2	Slot 3	Slot 4 *	Slot 5	Slot 6	Slot 7	Slot 8
F	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
G	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
H	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)
J	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	QLogic QLE2692 16Gb FC HBA[3]	Reserved	QLogic QLE8442 10GbE NIC [1, 3] (iSCSI capable)

Table 6-4 Available 5340 Appliance PCIe-based I/O configurations *(continued)*

I/O configuration option	Slot 1 *	Slot 2	Slot 3	Slot 4 *	Slot 5	Slot 6	Slot 7	Slot 8

***** The 16Gb Fibre Channel HBA ports in slots 1 and 4 are used to connect the NetBackup 5340 Appliance compute node to the Veritas 5U84 Primary Storage Shelf.

† Available with both NetBackup Appliance software release 3.0 or later, and the Flex Appliance software release

†† Available only with NetBackup Appliance software release 3.0 or later

PCIe card cable connection types:

[1] Direct-Attach copper cable (also called a Twinaxial cable or Twinax)

[2] Standard copper

[3] Fiber optic cable

Chapter 7

About the HBA port mode configuration

This chapter includes the following topics:

Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances

Note: Before you start configuring a particular FC feature on the appliance, make sure that it is supported with your appliance HBA configuration.

See "Fibre Channel feature support with appliance HBA configurations" on page 20.

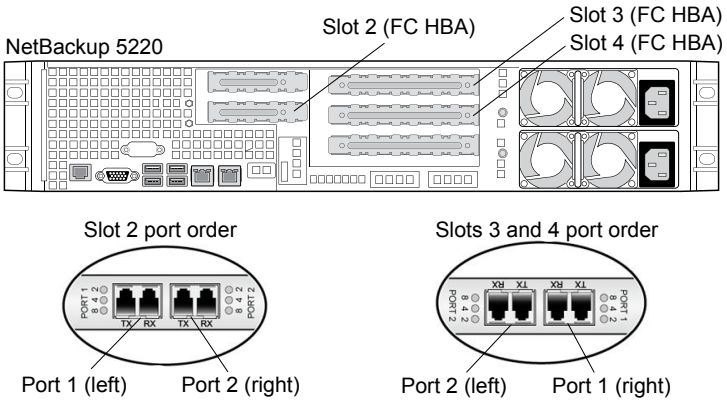
NetBackup 5220 FC HBA slots and ports

The NetBackup 5220 Appliance can be preinstalled with up to three PCIe 8 Gb Fibre Channel HBA cards.

On a NetBackup 5220, slots 2 - 4 support FC.

Figure 7-1 describes the supported FC HBA slot locations and the port order for the installed FC HBA cards.

Figure 7-1 NetBackup 5220 FC HBA slots and ports



For the slot location of the NetBackup 5220 appliance HBA configurations, see the *NetBackup 5220 Appliance Product Guide*.

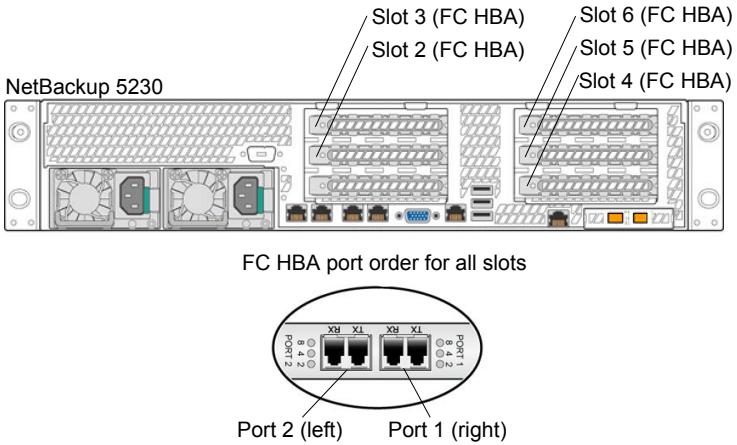
NetBackup 5230 FC HBA slots and ports

The NetBackup 5230 Appliance can be preinstalled with up to five PCIe 8 Gb Fibre Channel HBA cards.

On a NetBackup 5230, slots 2 - 6 support FC.

Figure 7-2 describes the supported FC HBA slot locations and the port order for the installed FC HBA cards.

Figure 7-2 NetBackup 5230 FC HBA slots and ports



See "About the NetBackup 5230 rear panel configurations" on page 29.

Summary of supported NetBackup 5220 and 5230 FC port options

Note: Veritas does not support reconfiguring the FC HBA cards in the appliance rear panel. Do not switch cards in different slots or install a used card from another appliance without contacting Veritas Technical Support.

Table 7-1 provides a summary of the supported NetBackup 5220 and 5230 FC options for each port.

Table 7-1 Summary of supported NetBackup 5220 and 5230 FC options

FC HBA slot	Supported options and required port configuration
Slot 2	**Note:** This slot is populated with an FC HBA card on HBA configurations D and E. Port 1 ■ SAN Client - FTMS target (5220 only) ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - FTMS target (5220 only) **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator ■ Auto Image Replication - initiator ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port. On 5220 HBA configurations D and E, the slots 2 and 4 are reserved for Fibre Transport media server (FTMS). If you enable SAN Client FTMS with those two configurations, Port 1 is changed to target mode for SAN Client by default.

Table 7-1 Summary of supported NetBackup 5220 and 5230 FC options *(continued)*

FC HBA slot	Supported options and required port configuration
Slot 3	**Note:** This slot is populated with an FC HBA card on 5220 HBA configuration B, C, D, E. This slot is populated with an FC HBA card on 5230 HBA configuration E. Port 1 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

Table 7-1 Summary of supported NetBackup 5220 and 5230 FC options *(continued)*

FC HBA slot	Supported options and required port configuration
Slot 4	**Note:** This slot is populated with an FC HBA card on 5220 HBA configuration D and E. This slot is populated with an FC HBA card on 5230 HBA configurations B, C, D and E Port 1 ■ SAN Client - FTMS target (5220 only) ■ Optimized duplication - initiator or target (5230 only) ■ Auto Image Replication - initiator or target (5230 only) ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - FTMS target (5220 only) **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator ■ Optimized duplication - target (5230 only) ■ Auto Image Replication - initiator ■ Auto Image Replication - target (5230 only) ■ Tape out - initiator ■ NetBackup for VMware - initiator On 5220 HBA configurations D and E, the slots 2 and 4 are reserved for FTMS. If you enable SAN Client FTMS with those two configurations, Port 1 is changed to target mode for SAN Client by default. Use only one option on each port.

Table 7-1 Summary of supported NetBackup 5220 and 5230 FC options *(continued)*

FC HBA slot	Supported options and required port configuration
Slot 5 - 6 (5230 only)	**Note:** The slots 5 - 6 are each populated with an FC HBA card on 5230 HBA configurations D and E. The slots 5 -6 are reserved for FTMS. If you enable SAN Client FTMS with those two configurations, Port 1 is changed to target mode for SAN Client by default. Port 1 ■ SAN Client - target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - target **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator ■ Auto Image Replication - initiator ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

See "About NetBackup SAN Client and Fibre Transport" on page 7.

See "About Fibre Transport for optimized duplication and Auto Image Replication between appliances" on page 10.

See "How to determine appliance HBA WWPNs" on page 59.

See "About Fibre Transport paths for NetBackup appliances" on page 25.

See "Supported Fibre Channel port configurations for the NetBackup 53xx appliances" on page 50.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

Supported Fibre Channel port configuration for the NetBackup 5240 appliances

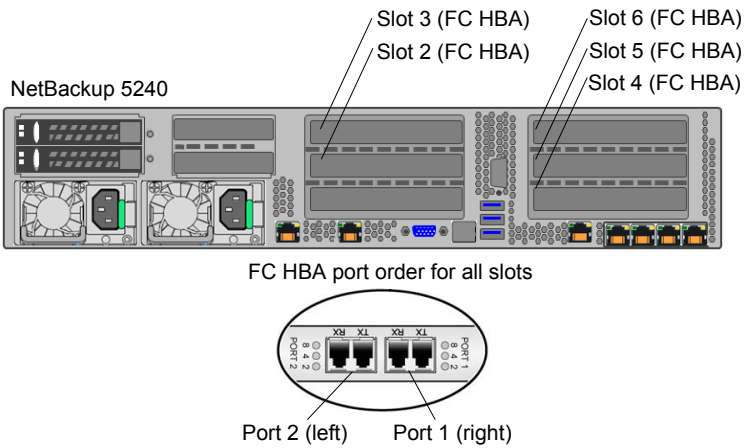
Note: Before you start configuring a particular FC feature on the appliance, make sure that it is supported with your appliance HBA configuration.

See "Fibre Channel feature support with appliance HBA configurations" on page 20.

The NetBackup 5240 Appliance can be ordered with one to five PCIe 8 Gb Fibre Channel (FC) HBA cards preinstalled.

Figure 7-3 describes the supported FC HBA slot locations and the port order for the installed FC HBA cards.

Figure 7-3 NetBackup 5240 FC HBA slots and ports



See "NetBackup 5240 Appliance I/O configuration options" on page 31.

Note: Veritas does not support reconfiguring the FC HBA cards in the appliance rear panel. Do not switch cards in different slots or install a used card from another appliance without contacting Veritas Technical Support.

Table 7-2 provides a summary of the supported NetBackup 5240 FC options for each port.

Table 7-2 Summary of supported NetBackup 5240 FC options

FC HBA slot	Supported options and required port configuration
Slot 2	**Note:** This slot is populated with an FC card on 5240 HBA configurations D and E. Port 1 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.
Slot 3	**Note:** This slot is populated with an FC card on 5240 HBA configuration E. Port 1 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

Table 7-2 Summary of supported NetBackup 5240 FC options *(continued)*

FC HBA slot	Supported options and required port configuration
Slot 4	**Note:** This slot is populated with an FC card on 5240 HBA configurations D, E, and K. Port 1 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.
Slot 5	**Note:** This slot is populated with an FC card on 5240 HBA configurations D, E, H, and K. This slot is reserved for Fibre Transport media server (FTMS) on 5240 HBA configurations D, E, H, and K. If you enable SAN Client FTMS with those two configurations, Port 1 is changed to target mode for SAN Client by default. Port 1 ■ SAN Client - FTMS target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - FTMS target **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator ■ Auto Image Replication - initiator ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

Table 7-2 Summary of supported NetBackup 5240 FC options *(continued)*

FC HBA slot	Supported options and required port configuration
Slot 6	**Note:** This slot is populated with an FC card on 5240 HBA configurations B, C, D, E, F, G, H, K, and L. This slot is reserved for FTMS on 5240 HBA configurations D, E, H, and K. If you enable SAN Client FTMS with those two HBA configurations, Port 1 is changed to target mode for SAN Client by default. Port 1 ■ SAN Client - FTMS target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - FTMS target **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator ■ Auto Image Replication - initiator ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

See “About NetBackup SAN Client and Fibre Transport” on page 7.

See “About Fibre Transport for optimized duplication and Auto Image Replication between appliances” on page 10.

See “How to determine appliance HBA WWPNs” on page 59.

See “About Fibre Transport paths for NetBackup appliances” on page 25.

See “Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances” on page 39.

See “Supported Fibre Channel port configurations for the NetBackup 53xx appliances” on page 50.

Supported Fibre Channel port configurations for the NetBackup 53xx appliances

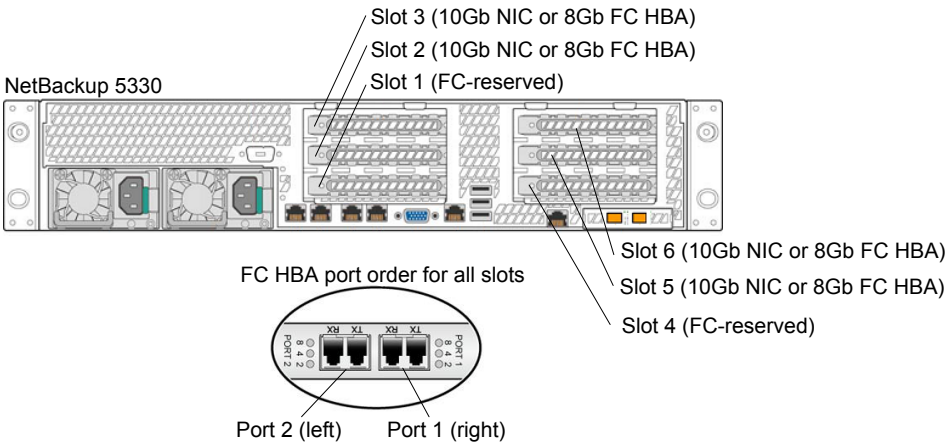
Note: Before you start configuring a particular FC feature on the appliance, make sure that it is supported with your appliance HBA configuration.

See "Fibre Channel feature support with appliance HBA configurations" on page 20.

The NetBackup 53xx appliance contains six populated PCIe card slots. Each slot contains either a Fibre Channel (FC) HBA card or an Ethernet card.

Figure 7-4 shows the PCIe slot locations and the port order for the installed FC HBA cards.

Figure 7-4 NetBackup 5330 PCIe slot locations and FC HBA port order



Note: NetBackup 5340 appliance has the same FC HBA configuration and HBA port order as a NetBackup 5330 appliance.

Note: Veritas does not support reconfiguring the FC HBA cards in the appliance rear panel. Do not switch cards in different slots or install a used card from another appliance without contacting Veritas Technical Support.

Table 7-3 describes the supported card type for each slot and the supported FC options.

Table 7-3 Supported NetBackup 53xx PCIe card slot configurations and FC options

Card slot and type	Supported FC options
Slot 1	Reserved exclusively for attachment to external storage (Primary Storage Shelf).
Slot 2	**Note:** This slot is populated with an FC card on 53xx HBA configurations D and E. Port 1 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.
Slot 3	**Note:** This slot is populated with an FC card on 53xx HBA configuration E. Port 1 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.
Slot 4	Reserved exclusively for attachment to external storage (Primary Storage Shelf).

Table 7-3 Supported NetBackup 53xx PCIe card slot configurations and FC options *(continued)*

Card slot and type	Supported FC options
Slot 5	**Note:** This slot is populated with an FC card on 53xx HBA configurations C, D and E. This slot is reserved for Fibre Transport media server (FTMS). If you enable SAN Client FTMS with those three configurations, Port 1 is changed to target mode for SAN Client by default. Port 1 ■ SAN Client - FTMS target ■ Optimized duplication - initiator ■ Auto Image Replication - initiator ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - FTMS target **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator ■ Auto Image Replication - initiator ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

Table 7-3 Supported NetBackup 53xx PCIe card slot configurations and FC options *(continued)*

Card slot and type	Supported FC options
Slot 6	**Note:** This slot is populated with an FC card on 5330 HBA configurations B, C, D and E. On 53xx HBA configurations C, D, and E, this slot is reserved for FTMS. If you enable SAN Client FTMS with those three configurations, Port 1 is changed to target mode for SAN Client by default. Port 1 ■ SAN Client - FTMS target ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Port 2 ■ SAN Client - FTMS target **Note:** If Port 1 is in the initiator mode, Port 2 cannot be set to the target mode. Port 2 can only be configured for the target mode when the **4 target port Fibre Channel connection** option is selected. ■ Optimized duplication - initiator or target ■ Auto Image Replication - initiator or target ■ Tape out - initiator ■ NetBackup for VMware - initiator Use only one option on each port.

See "About NetBackup SAN Client and Fibre Transport" on page 7.

See "About Fibre Transport for optimized duplication and Auto Image Replication between appliances" on page 10.

See "How to determine appliance HBA WWPNs" on page 59.

See "About Fibre Transport paths for NetBackup appliances" on page 25.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

About the factory default port mode configuration

All Fibre Channel (FC) HBA ports on the NetBackup 52xx and 53xx appliance default to the standard initiator mode. However, to use the appliance as a target for hosting backup images from SAN clients or from another appliance, you need to use the ports in target mode.

The NetBackup appliance provides a predefined target port configuration for the following features:

- Fibre Transport media server (FTMS) for SAN client backup and restore
- Optimized duplication and Auto Image Replication over FC

When you enable the FC features for the first time, the predefined port configuration is applied. However, if you have customized the port configuration used by a feature before you enable the feature, the customized port configuration is used instead.

About the FTMS target port configuration

Note: Two FC HBA cards are reserved for FTMS. Only the reserved cards are used for FTMS.

On an appliance that supports FTMS, target port option can be set to either of the following:

- **2 target port Fibre Channel connection**
- **4 target port Fibre Channel connection**

When you enable this feature, the default option is **2 target port Fibre Channel connection**, and Port 1 on both of the two cards is changed to the target mode. This option always uses Port 1 on both of the FC HBA cards.

The **4 target port Fibre Channel connection** always uses Port 1 and Port 2 on both of the reserved FC HBA cards.

About the default port configuration for optimized duplication and Auto Image Replication

- The default port configuration may not use all of the available FC HBA cards. For example, the FC HBA card in slot 4 on 5230 E configuration is not used.
- When you assign initiator ports for the appliance as a source host, you can use any HBA port as initiators except those ports that default to FTMS target ports (Port 1 on the FTMS-reserved FC HBA cards). This is because the appliance only turn those HBA ports from the standard initiator mode to the target mode when the feature is working.

- If you have changed the port configuration, the customized port configuration takes effect. However, you can restore the default port configuration.

Note: In the predefined configuration, Port 2 on each card is used as a target port. Port 1 stays in the standard initiator mode, but is not used until you enable Fibre Transport on the appliance as a source.

See "Configuring Fibre Transport media server settings" on page 72.

See "Configuring Fibre Transport on a target appliance for optimized duplication and replication" on page 80.

See "Default port mode configuration for FTMS, optimized duplication, and Auto Image Replication" on page 55.

Default port mode configuration for FTMS, optimized duplication, and Auto Image Replication

This topic summarizes the predefined FC HBA port configuration for FTMS, optimized duplication, and Auto Image Replication on NetBackup appliances. Note that the defined target port only works in target mode when the feature is running.

Table 7-4 describes the factory default target port configuration for a 5220 appliance.

Table 7-4 5220 factory default port configuration

HBA configuration	FTMS	Optimized duplication and replication
5220 A	Not applicable	Not applicable
5220 B	Not applicable	Slot 3, Port 1 - initiator Slot 3, Port 2 - target
5220 C	Not applicable	Slot 3, Port 1 - initiator Slot 3, Port 2 - target
5220 D	Slots 2 and 4, Port 1 - target	Slot 3, Port 1 - initiator Slot 3, Port 2 - target
5220 E	Slots 2 and 4, Port 1 - target	Slot 3, Port 1 - initiator Slot 3, Port 2 - target

Table 7-5 describes the factory default target port configuration for a 5230 appliance.

Table 7-5 5230 factory default port configuration

HBA configuration	FTMS	Optimized duplication and replication
5230 A	Not applicable	Not applicable
5230 B	Not applicable	Slot 4, Port 1 - initiator Slot 4, Port 2 - target
5230 C	Not applicable	Slot 4, Port 1 - initiator Slot 4, Port 2 - target
5230 D	Slots 5 and 6, Port 1 - target	Slots 2 and 4, Port 1 - initiator Slots 2 and 4, Port 2 - target
5230 E	Slots 5 and 6, Port 1 - target	Slots 2 and 4, Port 1 - initiator Slots 2 and 4, Port 2 - target

Table 7-6 describes the factory default target port configuration for a 5240 appliance.

Table 7-6 5240 factory default port configuration

HBA configuration	FTMS	Optimized duplication and replication
5240 A	Not applicable	Not applicable
5240 B	Not applicable	Slot 6, Port 1 - initiator Slot 6, Port 2 - target
5240 C	Not applicable	Slot 6, Port 1 - initiator Slot 6, Port 2 - target
5240 D	Slots 5 and 6, Port 1 - target	Slots 2 and 4, Port 1 - initiator Slots 2 and 4, Port 2 - target
5240 E	Slots 5 and 6, Port 1 - target	Slots 2 and 4, Port 1 - initiator Slots 2 and 4, Port 2 - target
5240 F	Not applicable	Slot 6, Port 1 - initiator Slot 6, Port 2 - target
5240 G	Not applicable	Slot 6, Port 1 - initiator Slot 6, Port 2 - target

Table 7-6 5240 factory default port configuration *(continued)*

HBA configuration	FTMS	Optimized duplication and replication
5240 H	Slots 5 and 6, Port 1 - target	Not applicable
5240 J	Not applicable	Not applicable
5240 K	Slots 5 and 6, Port 1 - target	Slot 4, Port 1 - initiator Slot 4, Port 2 - target
5240 L	Not applicable	Slot 6, Port 1 - initiator Slot 6, Port 2 - target

Table 7-7 describes the factory default target port configuration for a 53xx appliance.

Table 7-7 53xx factory default port configuration

HBA configuration	FTMS	Optimized duplication and replication
53xx A	Not applicable	Not applicable
53xx B	Not applicable	Slot 6, Port 1 - initiator Slot 6, Port 2 - target
53xx C	Slots 5 and 6, Port 1 - target	Not applicable
53xx D	Slots 5 and 6, Port 1 - target	Slot 2, Port 1 - initiator Slot 2, Port 2 - target
53xx E	Slots 5 and 6, Port 1 - target	Slots 2 and 3, Port 1 - initiator Slots 2 and 3, Port 2 - target

See "About the NetBackup 5230 rear panel configurations" on page 29.

See "NetBackup 5240 Appliance I/O configuration options" on page 31.

See "NetBackup 5330 Appliance compute node PCIe slot I/O configuration options" on page 33.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

See “Supported Fibre Channel port configurations for the NetBackup 53xx appliances” on page 50.

Chapter 8

Zoning the FC SAN

This chapter includes the following topics:

How to determine appliance HBA WWPNs

You must use physical port ID or World Wide Port Name (WWPN) when you specify the HBA ports on NetBackup appliances.

To determine the WWPNs, use the `Main_Menu > Manage > FibreChannel > Show` command in the NetBackup Appliance Shell Menu. The command output provides the information about ports based on the slot number.

For complete information about the NetBackup Appliance Shell Menu, see the *NetBackup Appliance Commands Reference Guide*.

See "About Fibre Transport for optimized duplication and Auto Image Replication between appliances" on page 10.

See "About Fibre Transport paths for NetBackup appliances" on page 25.

See "About backup to tape support for NetBackup appliances" on page 12.

See "About NetBackup appliance as a VMware backup host" on page 14.

About zoning the SAN for NetBackup appliances

Before you can configure and use the NetBackup Fibre Transport (FT) mechanism, the SAN must be configured and operational.

The NetBackup appliance supports the following SAN configurations:

- Node port (N_Port) switched configuration.
- Fibre Channel arbitrated loop (FC-AL) configuration.
  FC-AL hubs are not supported.

For SAN switched configurations, proper zoning prevents Fibre Transport traffic from using the bandwidth that may be required for other SAN activity. Proper zoning also limits the devices that the host bus adapter (HBA) ports discover; the ports should detect the other ports in their zone only. Without zoning, each HBA port detects all HBA ports from all hosts on the SAN. The potentially large number of devices may exceed the number that the operating system supports.

Instructions for how to configure and manage a SAN are beyond the scope of the NetBackup documentation. However, the following recommendations may help you optimize your SAN traffic.

Table 8-1 describes the best practices for zoning the SAN on NetBackup appliances.

Table 8-1 Best practices for zoning the SAN on NetBackup appliances

Guideline	Description
One initiator per zone, multiple targets acceptable.	Veritas recommends that you create zones with only a single initiator per zone. Multiple targets in a single zone are acceptable, only if all of the targets are similar. **Note:** For data duplication between two NetBackup 52xx or 53xx appliances, you must create zones with only one single initiator and one single target per zone. Tape target resources should be in separate zones from disk target resources, regardless of initiator. However, both sets of resources may share the same initiator.
Be aware of performance degradation when a port is configured for multiple zones.	If you use a single port as an initiator or a target for multiple zones, this port can become a bottleneck for the overall performance of the system. You must analyze the aggregate required throughput of any part of the system and optimize the traffic flow as necessary.

Table 8-1 Best practices for zoning the SAN on NetBackup appliances *(continued)*

Guideline	Description
For fault tolerance, spread connectivity across HBA cards and not ports.	To ensure the availability of system connections, if you incorporate a multi-path approach to common resources, pair ports on separate cards for like zoning. This configuration helps you avoid the loss of all paths to a resource in the event of a card failure.
Zone the SAN based on WWN to facilitate zone migrations, if devices change ports.	It is recommended that you perform SAN zoning based on WWN. If switch port configurations or cabling architectures need to change, the zoning does not have to be recreated.

Table 8-2 describes the zones you should use for your SAN traffic.

Diagrams that show the zones are available at the following link.

See “About Fibre Transport paths for NetBackup appliances” on page 25.

Note: You must use physical port ID or World Wide Port Name (WWPN) when you specify the HBA ports on NetBackup appliances.

See “How to determine appliance HBA WWPNs” on page 59.

Table 8-2 Appliance zones

Zone	Description
Fibre Transport backup zone	A Fibre Transport backup zone should include only the Fibre Transport traffic between the SAN clients and the appliance. The backup zone should include the following HBA ports: ■ The target port of the HBA—connect this port to a Fibre Channel switch port. If you have two HBAs, you can use both of them. The use of two ports provides redundancy. **Note:** The supplied QLogic FC HBA card in a NetBackup appliance uses a special NetBackup target mode driver for the target port. The target mode driver replaces the default, initiator mode Fibre Channel driver. The target mode driver applies only to the supplied QLogic HBA card. You must define the appliance target port by physical port ID or World Wide Port Name (WWPN). The target mode driver WWPNs are not unique because they are derived from the Fibre Channel HBA WWPN. ■ Ports on the SAN client HBAs that connect to the appliance—connect each SAN client HBA port to ports on the same Fibre Channel switch. You can define SAN client ports by either port ID or WWPN. However, if you use one method for all devices, zone definition and management is easier. The ports on the SAN clients use the standard initiator mode driver. To promote multistream throughput, each SAN client should detect all target mode devices of the appliance HBA port or ports in the zone. Each appliance HBA target port exposes two target mode devices. ■ Define the zones on the switch so that the client ports and the HBA target ports are in the same zone. Some Veritas appliance models include one or more Fibre Channel HBA cards that can be used for Fibre Transport. If your appliance does not include any of these cards, an authorized Veritas representative must install and configure an approved FC HBA card.

Table 8-2 Appliance zones *(continued)*

Zone	Description
Fibre Transport storage zone	A Fibre Transport storage zone carries the Fibre Transport traffic from a storage source to a storage destination. The source host is an NetBackup 52xx or 53xx appliance. The storage destination host is a NetBackup deduplication appliance or another NetBackup 52xx or 53xx appliance. The traffic can be either for duplication or for backups. For duplication, the deduplicated data is sent to the destination for storage. For backups, the data first travels to the NetBackup 52xx or 53xx appliance and is then sent to the NetBackup deduplication appliance for storage. The storage zone should include the following HBA ports: ■ The initiator port of the HBA in the NetBackup appliance—connect this port to a Fibre Channel switch port. It does not have to be the same switch as the backup zone. The NetBackup 52xx or 53xx appliance is the source for the duplication. The initiator ports use the standard initiator mode driver. ■ The NetBackup 52xx and 53xx appliance target ports. The 52xx or 53xx appliance is the target for the duplication. ■ Define the zones on the switch so that the NetBackup appliance initiator port and the NetBackup deduplication appliance target port are in the same zone. **Note:** For data duplication between two NetBackup 52xx or 53xx appliances, you must create zones with only one single initiator port and one single target port.
External tape storage zone	If you use a tape library as storage, create a separate zone for that traffic. The tape storage zone does not use NetBackup Fibre Transport; it uses the standard initiator mode driver.

About HBA link status on the NetBackup Appliance Shell Menu

The HBA link status on a Fibre Chanel (FC) HBA port shows the current FC link status on the port. By monitoring the link status, you can know whether a port is correctly connected or whether it is ready for work.

To monitor the HBA link status, run the `Main > Manage > FibreChannel > Show [Ports]` command from the NetBackup Appliance Shell Menu. The output shows the link status of all the HBA ports.

The following list shows the possible status of a port in the standard initiator mode:

- Online
  - The initiator port is connected to an FC switch.

    - The initiator port is directly connected to a target port for SAN Client Fibre Transport media server (FTMS).
- Offline
  The initiator port is connected to an FC switch but the negotiation has failed.
- Linkdown
  The initiator port has no FC connection

The following list shows the possible link status of a port in target mode for SAN Client FTMS:

- Fabric
  The target port is connected to an FC switch with an active FC zone.
- Disconnected
    - The target port is connected to an FC switch but the FC zone is not active.
    - The target port is connected to another target port for SAN Client FTMS through an FC switch.

      Note: : If two target ports for SAN Client FTMS are connected through an FC switch, you can find that one port shows Disconnected, and the other shows Loop.

- Loop
  The target port is connected to another target port for SAN Client FTMS through an FC switch.
- Ptp
  The target port is connected to an FC switch and the negotiation is ongoing.

The following list shows the possible link status of a port in the target mode for optimized duplication and Auto Image Replication:

- Online
  The target port is connected to an FC switch.
- Offline
  The target port is connected to an FC switch but the negotiation has failed.
- Linkdown
  The target port has no FC connection.

To monitor the link status of the ports that are used to duplicate data between two 52xx or 53xx appliances, you can also use the NetBackup Appliance Web Console. The **Settings > Network > FibreTransport** page displays a simplified status of **up** or **down** for those ports.

See “About the HBA port mode configuration table” on page 68.

Chapter 9

About the Fibre Transport page on the NetBackup Appliance Web Console

This chapter includes the following topics:

Settings > Network > Fibre Transport

The Fibre Transport (FT) options let you set up the appliance for FT use with SAN Clients or for optimized duplication and Auto Image Replication. By default, the FT options are disabled and the configuration of one option does not affect the other one.

The following describes the FT options:

Table 9-1 FT option descriptions

FT option	Description
Enable SAN Client Fibre Transport on the Media Server (use FT for backups to this appliance) ■ **2 target port Fibre Channel connection** ■ **4 target port Fibre Channel connection**	This option lets you enable Fibre Transport media server (FTMS) on the appliance for SAN Client FT use. You must also choose from the following appliance target port configuration for SAN clients when you enable the option. ■ **2 target port Fibre Channel connection** - Port 1 on both affected FC HBA cards is set to the target mode. ■ **4 target port Fibre Channel connection** - Port 1 and Port 2 on both affected FC HBA cards are set to the target mode. By default, the option is disabled and all ports are in the initiator mode. Before you enable this option, be aware of the following requirements and behavior: ■ To use this option, a SAN Client license key must reside on the master server that is associated with this appliance. If FT is not currently used and you want to use the SAN Client feature, you must first obtain a SAN Client license key. To obtain the appropriate license key, contact Veritas Technical Support. Once you have the license key, you must add it to the master server. ■ When this option is enabled or changed, a warning appears to alert you that the appliance requires a restart. Before you enable this option, it is recommended that you first suspend or cancel all jobs. See "How to configure Fibre Transport media server for SAN Client" on page 71. See "Configuring Fibre Transport media server settings" on page 72.
Enable Fibre Transport for replication to other NetBackup Appliances	This option lets you enable Fibre Transport for optimized duplication and Auto Image Replication to other NetBackup appliances that are used as target hosts. By default, this option is disabled and the appliance cannot communicate with a target appliance over FC. **Note:** To use this option, you must enable FC communication on the associated target NetBackup appliance. If you plan to use a NetBackup 52xx or 53xx appliance as the target, see the following for configuration. See "How to configure Fibre Transport for optimized duplication and Auto Image Replication over FC" on page 76.

Table 9-1 FT option descriptions *(continued)*

FT option	Description
Enable Fibre Transport Deduplication on this appliance as a replication target	This option lets you configure FT on a NetBackup 52xx or 53xx appliance to use it as a target for optimized duplication and Auto Image Replication. When the option is enabled, the **Port mode configuration** table is activated, and then you can configure the HBA ports to be target ports for optimized duplication and Auto Image Replication. See "About the HBA port mode configuration table" on page 68. **Note:** To use this option, you must also enable FT for optimized duplication and Auto Image Replication to other NetBackup Appliances on the associated source appliance. See "Configuring Fibre Transport on a target appliance for optimized duplication and replication" on page 80. By default, this option is disabled and the other appliances cannot use this appliance as a target through FC connection.

For more information about SAN Client and Fibre Transport support on NetBackup appliance, see the *NetBackup Appliance Fibre Channel Guide*.

See "How to configure Fibre Transport media server for SAN Client" on page 71.

See "How to configure Fibre Transport for optimized duplication and Auto Image Replication over FC" on page 76.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

See "Supported Fibre Channel port configurations for the NetBackup 53xx appliances" on page 50.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

About the HBA port mode configuration table

The port mode configuration table shows the details of the HBA ports that can be used for Fibre Transport Deduplication.

Fibre Transport Deduplication is a feature that enables you to use an appliance as a target host for optimized duplication and Auto Image Replication.

Note: The HBA port mode configuration table only shows information of the HBA ports for Fibre Transport Deduplication. The ports that are reserved for SAN Client Fibre Transport are not shown in this table.

You can configure an HBA port in the table to be in target mode or standard initiator mode.

Table 9-2 describes the HBA port mode configuration table.

Table 9-2 HBA port mode configuration

Column Name	Description
Slot	This column shows the slot number of the HBA card on this appliance.
Port	This column shows the port number of the HBA ports.
Link Status	This column shows whether the HBA port is connected to a fabric switch or another port. The link status on an HBA port can be the following: ■ **up** - connected ■ **down** - not connected
World Wide Name (WWN)	This column shows the port WWN. You can use the port WWN to identify a port on the appliance.
Port Mode	This column shows the configured port mode of an HBA port. The available options for HBA port mode are the following: ■ **Initiator** - Standard initiator mode ■ **Target (MSDP)** - Target mode for optimized duplication and Auto Image Replication You can click on the current port mode, and then change the port mode configuration. If you change the port mode, you can see the new port mode with a red earmark. You can click on the **Restore FactoryDefaults** option to restore the port configuration to the factory default state. See "About the factory default port mode configuration" on page 54. See "Configuring Fibre Transport on a target appliance for optimized duplication and replication" on page 80.

For more information about HBA port options, review the following topics:

See “Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances” on page 39.

See “Supported Fibre Channel port configurations for the NetBackup 53xx appliances” on page 50.

Chapter 10

Configuring Fibre Transport on the appliance

This chapter includes the following topics:

How to configure Fibre Transport media server for SAN Client

Table 10-1 provides an overview of how to configure the Fibre Transport media server(FTMS) on the appliance.

Table 10-1 FT media server configuration process

Step	Action	Description
Step 1	Determine whether your appliance HBA configuration supports FTMS.	Identify your appliance HBA configuration. See "About the NetBackup 5230 rear panel configurations" on page 29. See "NetBackup 5240 Appliance I/O configuration options" on page 31. See "NetBackup 5330 Appliance compute node PCIe slot I/O configuration options" on page 33. Determine whether your appliance HBA configuration supports FTMS. See "Fibre Channel feature support with appliance HBA configurations" on page 20.
Step 2	Learn about SAN Client and FTMS for NetBackup appliance.	See "About NetBackup SAN Client and Fibre Transport" on page 7.
Step 3	Learn about HBA port reservation and default port mode for FTMS.	See "About the factory default port mode configuration" on page 54.
Step 4	Create Fibre Transport (FT) backup zones.	Select HBA ports and learn about zoning best practices. See "About zoning the SAN for NetBackup appliances" on page 59. Determine the appliance HBA WWPNs for zoning. See "How to determine appliance HBA WWPNs" on page 59.
Step 5	Enable FTMS on the appliance.	To use FT for backups to the appliance, you must enable FTMS on the appliance. See "Configuring Fibre Transport media server settings" on page 72.

See "About Fibre Transport paths for NetBackup appliances" on page 25.

Configuring Fibre Transport media server settings

Note: Enabling or changing the SAN Client FT settings requires a restart of the appliance. Before you enable or change these settings, it is recommended that you first suspend or cancel all jobs.

The following describes the FC HBA cards that are affected:

- NetBackup 5220 - FC HBA cards in slots 2 and 4
- NetBackup 5230 and NetBackup 53xx - FC HBA cards in slots 5 and 6

- NetBackup 5240 - FC HBA cards in slots 5 and 6

To configure the SAN Client Fibre Transport option from the NetBackup Appliance Web Console

1. Log on to the NetBackup Appliance Web Console.
2. Click **Settings > Network**, then select **Fibre Transport**.
3. To change the target port option for SAN Client FTMS, do one of the following:
   - Select **2 target port Fibre Channel connection**. Then, click **Save**.
   - Select **4 target port Fibre Channel connection**. Then, click **Save**.
     When the message appears to alert you that the appliance requires a restart, click **Reboot** to continue or click **Cancel** to exit without making changes.
4. If you wan to disable the SAN Client Fibre Transport option, deselect the option to clear the check mark. Then, click **Save**.
5. After the appliance has been restarted, verify the SAN Client FTMS settings as follows:
   - Log on to the NetBackup Appliance Web Console.
   - Click **Settings > Network**, then select **Fibre Transport**.
   - Verify that the settings are correct.

To configure the SAN Client Fibre Transport option from the NetBackup Appliance Shell Menu

1. Log on to the NetBackup Appliance Shell Menu.
2. To enable the SAN Client FTMS feature, run the following command:

   ```
   Main > Settings > FibreTransport SANClient Enable
   ```

   When the message appears to alert you that the appliance requires a restart, type **yes** to continue or type **no** to exit without making changes.
3. To change the SAN Client FTMS settings, do one of the following:
   - To configure two ports as target ports, run the following command:
     ```
     Main > Manage > FibreChannel > Configure 2
     ```
   - To configure four ports as target ports, run the following command:
     ```
     Main > Manage > FibreChannel > Configure 4
     ```
4. If you want to disable the SAN Client FTMS feature, run the following command:

   ```
   Main > Settings > FibreTransport SANClient Disable
   ```
5. After the appliance has been restarted, verify the SAN Client FTMS settings as follows:

- Log on to NetBackup Appliance Shell Menu
- Run the following two commands:
  `Main > Settings > FibreTransport SANClient Show`
- Verify that the settings are correct.
  The following is the ouput when the feature is enabled:

  ```
  - [Info] Fibre Transport Server enabled.
  ```

  The following is the ouput when the feature is disabled:

  ```
  - [Info] Fibre Transport Server disabled.
  ```

See "Settings > Network > Fibre Transport" on page 66.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

See "Supported Fibre Channel port configurations for the NetBackup 53xx appliances" on page 50.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

About Fibre Transport media server verification

After you install and configure a Fibre Transport (FT) media server, you can use the `Settings` > `FibreTransport SANClient Show` command to show the status of the SAN Client feature. When you run the `FibreTransport SANClient Show` command and the Fibre Transport (FT) media server is configured properly, you see an output similar to the following:

```
Testsys.Settings> FibreTransport SANClient Show
Fibre Transport server installed and running.
```

You can also use the `Manage > FC Show` command to verify and confirm the status of the SAN Client feature. From the output that you receive after you have run the `Manage > FC Show` command, you can verify the following:

- The `qla2xxx` and `windrvr6` drivers are loaded.
- The target ports are in `Target` mode by physical state, and their configuration type is `Target(FTMS)`
- Under the **Status** column, the target mode ports should have a status of **Fabric** if the port is physically connected to something such as a switch
  Nothing ever appears under the **Remote Ports** column for target mode ports.

To find more information about the target mode ports, you must look at the VxUL logs for the originator 199 (`nbftsvr`).

Guidelines for changing NetBackup appliance FT target ports to receive data streams from multiple SAN Client FC initiator ports

If you want an appliance Fibre Transport (FT) target port to handle data streams from more than two SAN client Fibre Channel (FC) initiator ports concurrently, consider changing the following NetBackup master server setting:

```
nbftconfig –setconfig –ncp 4
```

Caution: This setting applies to all target ports on all FT media servers in your NetBackup domain. This setting should only be increased from the default (2) when all of the following conditions exist:

All FT target ports on all FT media servers are eight gBit/s link speeds.

The total mix of FT jobs is such that all of the FT media servers have unused FT pipes.

A large number of jobs from other SAN Client machines are waiting for resources.

The back-end storage units have a lot of unused throughput capacity.

If you increase the `–ncp` setting too high, the load balancing between multiple FT media servers when all SAN Client machines are zoned to all FT media servers could become highly imbalanced.

Note: A mix of SAN Client job loads where some clients use four or more FT pipes concurrently with several other SAN Clients that only attempt to use a single FT pipe at a time increases the odds that a higher `–ncp` setting may cause FT media server imbalance.

For four gBit/s links, there may be situations where overall throughput can degrade when some or all SAN Clients are using multiple concurrent data streams. This scenario may be especially true for NetBackup 5220 appliances. In those situations, `nbftconfig –setconfig –ncp 3` may be a better option.

How to configure Fibre Transport for optimized duplication and Auto Image Replication over FC

Table 10-2 provides an overview of how to configure Fibre Transport(FT) on the appliance for optimized duplication and Auto Image Replication over FC.

Table 10-2 FT configuration process for optimized duplication and Auto Image Replication over FC

Step	Action	Description
Step 1	Determine whether your appliance HBA configuration supports FT for optimized duplication and Auto Image Replication. **Note:** The HBA configuration of 53xx C and 5240 H support optimized duplication and Auto Image Replication over FC, but can only support using the appliance as a source.	Identify your appliance HBA configuration. See "About the NetBackup 5230 rear panel configurations" on page 29. See "NetBackup 5240 Appliance I/O configuration options" on page 31. See "NetBackup 5330 Appliance compute node PCIe slot I/O configuration options" on page 33. Determine whether your appliance HBA configuration supports FT for optimized duplication and Auto Image Replication. See "Fibre Channel feature support with appliance HBA configurations" on page 20.
Step 2	Learn about FT for optimized duplication and Auto Image Replication.	See "About Fibre Transport for optimized duplication and Auto Image Replication between appliances" on page 10.
Step 3	Learn about default HBA port mode for optimized duplication and Auto Image Replication over FC.	See "About the factory default port mode configuration" on page 54.
Step 4	Create FT storage zones.	Select HBA ports and learn about zoning best practices. See "About zoning the SAN for NetBackup appliances" on page 59. Determine the appliance HBA WWPNs for zoning. See "How to determine appliance HBA WWPNs" on page 59.
Step 5	Configure FT settings for optimized duplication and Auto Image Replication.	Configure FT settings on the source appliance. See "Configuring Fibre Transport to other NetBackup appliances" on page 77. Configure FT settings on the targe 52xx and 53xx appliance. See "Configuring Fibre Transport on a target appliance for optimized duplication and replication" on page 80.

See "How to configure two NetBackup 52xx or 53xx appliances in different domains for MSDP replication" on page 82.

Configuring Fibre Transport to other NetBackup appliances

Use the following procedure to configure Fibre Transport (FT) to other NetBackup appliances.

Note: When the FT for replication to other NetBackup appliances is enabled or changed, the deduplication storage daemons require a restart. It is recommended that you first suspend or cancel all jobs before you enable or change this setting.

To configure Fibre Transport to other NetBackup appliances from the NetBackup Appliance Web Console

1. Log on to the NetBackup Appliance Web Console.
2. Click **Settings > Network**, then select **Fibre Transport**.
3. To enable Fibre Transport to other NetBackup appliances, click to select the **Enable Fibre Transport for replication to other NetBackup Appliances**. Then, click **Save**.

   When the message appears to inform you of the required the appliance version, click **OK** to continue or click **Cancel** to exit without making changes.

   Note: You must also enable FC communication on the associated NetBackup appliance.

   On a target NetBackup 52xx or 53xx, you must enable that appliance as a replication target to use it as the storage destination.

   See "Configuring Fibre Transport on a target appliance for optimized duplication and replication" on page 80.

   ---

4. To disable the **Fibre Transport to other NetBackup Appliances** option, deselect the check box to clear the check mark. Then, click **Save**.

To configure Fibre Transport to other NetBackup appliances from the NetBackup Appliance Shell Menu

1. Log on to the NetBackup Appliance Shell Menu.
2. Enable Fibre Transport for replication to other NetBackup appliances by running the following command:

   ```
   Main > Settings > FibreTransport NBUAppliances Enable
   ```

3 If you want to disable Fibre Transport for replication to other NetBackup appliances, run the following command:

```
Main > Settings > FibreTransport NBUAppliances Disable
```

4 To verify that the settings are correct, run the following command:

```
Main > Settings > FibreTransport NBUAppliances Show
```

The following is the output when the feature is enabled:

```
fc transport enabled.
```

The following is the output when the feature is disabled:

```
fc transport disabled.
```

See "Settings > Network > Fibre Transport" on page 66.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

See "Supported Fibre Channel port configurations for the NetBackup 53xx appliances" on page 50.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

See "About the Fibre Transport chunk size" on page 78.

About the Fibre Transport chunk size

The chunk size specifies the amount of data that is buffered before transmission over Fibre Transport (FT). It is an advanced setting on the sender side for optimized duplication and replication to other NetBackup appliances over FT.

By default, the chunk size is not set or used. The chunk size setting is not required for optimized duplication and replication over FT. It is highly dependent on user deployment and network status. If you find it necessary to improve backup performance, you can adjust the chunk size as needed to determine a proper value for your environment and the current network status.

Typically, the sender on the initiating appliance receives a block of data and starts the transmission regardless of its size. After this data block is transmitted, the sender waits for a confirmation from the receiver (or target appliance) before it transmits the next block. The transmission continues if the appliance receives confirmations without interruption. If the network latency is high, confirmation time also increases.

By setting the chunk size, you determine that data blocks must be delivered by using chunks of the specified size. In a single transmission session, if the sender

receives a block of data that is greater than the specified chunk size, it fragments the data into chunks for transmission. The remaining data from the fragmentation is allocated to the next chunk. If a data block is smaller than the specified chunk size, the sender adds it into the buffer to link it together with data from the preceding or the following block. Data block linking continues until the buffered data has reached the chunk size, and then the appliance transmits the chunk. After transmitting, the sender waits for a confirmation from the receiver before it sends out the next chunk. If the session closes, the remaining data is transmitted.

A data block over FT is typically 128 KB or smaller. Setting the chunk size to a value equal to or greater than 128 KB allows the appliance to link together small data blocks into big chunks. Therefore, fewer confirmations are needed. The result may improve the transmission efficiency when the network latency is high. The data block linking also reduces the overhead that is generated with the data.

Network latency can be high in the following scenarios, and you can consider using the chunk size to see if anything improves.

- Data transmitted over a long distance and an IP network that is used for the transmission along with FC.
- Data transmitted over a long distance through an FC-only connection.

Note: If you observe a big downgrade on backup performance over a short-distance FC-only connection, try adjusting the chunk size and see if there is any improvement.

The default value for chunk size is "0", which means the chunk size is not set or used. If you set the chunk size to a value equal or greater than "1", you specify the size of each data chunk that is sent to the FC network. To enable and manage the chunk size setting, use the `Main > Support > FibreTransport > ChunkSize` command from the NetBackup Appliance Shell Menu. The available chunk size range is 1-2048 KB. The recommended values are 128 KB, 256 KB, 512 KB, 1024 KB, or 2048 KB. You may also need to test with other values to determine a proper value for your environment.

The chunk size may not work for the following reasons:

- A limited bandwidth
- Network congestion
- Not using a dedicated data network

Configuring Fibre Transport on a target appliance for optimized duplication and replication

The Fibre Transport Deduplication feature enables you to use a NetBackup 52xx or 53xx appliance as a target host for optimized duplication and Auto Image Replication over Fibre Channel (FC).

If you have configured one or more target ports for Fibre Transport Deduplication, and you do one of the following, you cause the physical state of one or more ports to change:

- Enabling the Fibre Transport Deduplication feature
- Disabling the Fibre Transport Deduplication feature
- Changing the port mode configuration when the feature is enabled

---

Note: You must restart all the appliances in the FC zone where the physical state of an HBA port is changed.

Note: To continue to use Fibre Transport Deduplication after a re-image operation, you must first restore the factory default port configuration or disable the feature. Then you can go on with other settings.

To configure a 52xx and 53xx appliance as a replication target using the NetBackup Appliance Web Console

1. Log on to the NetBackup Appliance Web Console.
2. Click **Settings > Network**, then select **Fibre Transport**.
3. To enable Fibre Transport Deduplication, click to select the **Enable Fibre Transport on this appliance as a replication target**.
4. If you want to keep the current port configuration, skip this step.

   If you want to change the port mode on the appliance, do the following:

   - In the **Port Mode** column, click on the current port mode of a port.
   - From the drop-down menu, select **Initiator** or **Target (MSDP)** to configure the port mode.
   - To restore the customized port configuration to the factory default state, click **Restore FactoryDefaults**.

   The port mode change is reflected on a diagram on the right of the page.

5 Click **Save** to apply the changed settings.

6 Restart the appliances in the FC zone where a port mode change has occurred.

To reduce the times of restarting, restart the appliances after you finish all the changes.

To configure a 52xx and 53xx appliance as a replication target using the NetBackup Appliance Shell Menu

1 Log on to the NetBackup Appliance Shell Menu.

2 To enable Fibre Transport Deduplication, run the following command:

```
Main > Settings > FibreTransport Deduplication Enable
[Current|FactoryDefault]
```

3 To configure the port mode, run the following command:

```
Main > Manage > FibreChannel > Configure Deduplication <Initiator
| Target> <HBAportid>
```

The `HBAportid` is slot number (1-6) and port number (1-2) of the HBA port. The format is *`Slot:Port`*.

4 To show the current port mode configuration, run the following command:

```
Main > Manage > FibreChannel > Show [Ports]
```

5 To disable the Fibre Transport Deduplication feature, run the following command:

```
Main > Settings > FibreTransport Deduplication Disable
```

6 Verify that the settings are correct by running the following command:

```
Main > Settings > FibreTransport Deduplication Show
```

This following is the output when the feature is enabled:

```
[Info] Fibre Transport Deduplication is enabled.
```

This following is the output when the feature is disabled:

```
[Info] Fibre Transport Deduplication is disabled.
```

7 Restart the appliances in the FC zone where the physical state of a port change has changed.

To reduce the times of restarting, restart the appliances after you finish all the changes.

See "Settings > Network > Fibre Transport" on page 66.

See "Supported Fibre Channel port configurations for the NetBackup 5220 and 5230 appliances" on page 39.

See "Supported Fibre Channel port configurations for the NetBackup 53xx appliances" on page 50.

See "Supported Fibre Channel port configuration for the NetBackup 5240 appliances" on page 46.

See "About the HBA port mode configuration table" on page 68.

See "About the factory default port mode configuration" on page 54.

About Fibre Transport Deduplication target mode port verification

The Fibre Transport Deduplication feature enables you to use a appliance as a target host for optimized duplication and Auto Image Replication. After you configure a Fibre Channel (FC) HBA card on a target appliance, you can use the `Settings > FibreTransport Deduplication Show` command to show the status of the Fibre Transport Deduplication feature. If you have configured the feature properly, you see the following output:

```
Testsys.Settings > FibreTransport Deduplication Show
[Info] Fibre Transport Deduplication is enabled.
```

You can also use the `Manage > FibreChannel > Show` command to verify and confirm the status of the Fibre Transport Deduplication feature is configured and working. You can verify the following from the output:

- The `qla2x00tgt`, `scst` and `scst_user` drivers are loaded.
- The **Configuration Type** column shows `Target(MSDP)` for the ports that you have configured as target ports.
- The **Physical State** column shows the `Target` mode for the ports with the configuration type `Target(MSDP)`.
- Under the **Status** column, the target mode ports should have a status of **Online**.

How to configure two NetBackup 52xx or 53xx appliances in different domains for MSDP replication

This topic describes how to establish the replication relationship between a NetBackup 52xx or 53xx appliance in an originating domain and a NetBackup 52xx or 53xx appliance in a target domain. The process is very similar to traditional (non-appliance) NetBackup environments that use Media Server Deduplication Pool (MSDP) replication in different domains.

Successful configuration requires that you perform other tasks that are documented in the *NetBackup Deduplication Guide*.

The following table describes the steps to configure two NetBackup 52xx or 53xx appliances in different domains for MSDP replication. References to other tasks are also included.

Table 10-3 Steps to configure two NetBackup 52xx appliances in different domains for MSDP replication

Step	Task description
1	On one of the NetBackup 52xx or 53xx appliances, log in to the NetBackup Appliance Shell Menu.
2	Obtain the NetBackup deduplication password of the domain by running the following command: `Main > Appliance > ShowDedupePassword` Record this password for later use in Step 4.
3	On the local NetBackup master server, log in and start the NetBackup Administration Console.
4	Add the NetBackup 52xx or 53xx as a replication target by using the root user and the password that you recorded in Step 2. For complete details, see the *NetBackup Deduplication Guide*. Refer to the following topic in the chapter titled **Configuring deduplication**: "Configuring a target for MSDP replication".
5	On the primary side, do the following: ■ Using the MSDP storage unit on the primary NetBackup 52xx or 53xx that is used for backups, create a storage lifecycle policy (SLP). ■ Create a **Replication** storage operation for this SLP, using the remote NetBackup 52xx or 53xx appliance as the destination. For complete details, see the *NetBackup Deduplication Guide*. Refer to the following topic in the chapter titled **Configuring deduplication**: "Creating a storage lifecycle policy".
6	On the remote side, do the following: ■ Create an SLP with the exact same name as the one that was created for the primary side. ■ Create an **Import** storage operation for this SLP, using the MSDP on the remote NetBackup 52xx or 53xx appliance as the destination.

To use Fibre Transport for replication, you must log on the appliances on the primary and remote side using the NetBackup Appliance Web Console or NetBackup Appliance Shell Menu, and do the following:

- On the primary side, configure the appliance as a source host for replication over Fibre Transport (FT).
  See "Configuring Fibre Transport to other NetBackup appliances" on page 77.
- On the remote side, configure the appliance as a target host for replication over FT.
  See "Configuring Fibre Transport on a target appliance for optimized duplication and replication" on page 80.

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