



# Symantec NetBackup **Blueprints**

## **Blueprint** for SAN Client

**Symantec Backup and Recovery Technical Services**



## Notice



This NetBackup Blueprint presentation includes example diagrams that contain objects that represent applications and platforms from other companies such as Microsoft and VMware. These diagrams may or may not match or resemble actual implementations found in end user environments. Any likeness or similarity to actual end user environments is completely by coincidence.

The goal of the diagrams included in this blueprint presentation is not to recommend specific ways in which to implement applications and platforms from other companies such as Microsoft and VMware; the purpose of these diagrams is to illustrate NetBackup best practices only.

For guidelines and best practices on installing and configuring applications and platforms from other companies, please refer to best practice documentation and other resources provided by those companies.

These **Blueprints** are designed to show customer challenges and how NetBackup solves those.

- Each Blueprint consists of:
  - **Pain Points:** Explain the current challenges a customer faces.
  - **Whiteboards & Example Diagrams:** Describe the implementation of NetBackup solution.
  - **Best Practices:** Present NetBackup best practices to avoid common pitfalls
- Use these **Blueprints** to present the NetBackup best practice implementation example



## Pain Points

- LAN backup and restore no longer meets SLAs
- Availability – Minimize the recovery window in case of downtime.
- Shrinking Backup Windows and increasing amounts of data to protect within those windows.
- High performance data transfer for the client and offloads the LAN with the backup traffic.
- Avoid slow LAN backups and restores and take advantage of high-speed backup and restore to disk and tape over the SAN.
- Replacement of SAN Media Server



## NetBackup Advantages

## What is SAN Client?

- SAN Client is a NetBackup optional feature that provides high-speed backups and restores of NetBackup clients.
- SAN Client supports both Disk storage and Tape storage. NetBackup allows the storage devices to be connected to the FT media servers by any means.
- SAN Client uses SCSI protocol to send backup and restore data over the FC SAN to/from a Fibre Transport (FT) Media Server – which directs backup and restore traffic to/from storage units.
  - Result is higher backup/restore performance.
  - SAN Client provides all the performance benefits of the SAN Media Server with none of the associated impact on the client system (has smaller footprint, lower resource consumption, and less complex NetBackup upgrade scenarios than SAN Media Server).
  - Supports Multiplexing and Multistreaming.



## Whiteboards and Diagrams



# White Boards: SAN Client Terminology



| Term               | Description  |
|--------------------|--|
| Fibre Transport    | NetBackup Fibre Transport (FT) 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. FT connections between NetBackup clients and NetBackup servers are referred to as FT pipes. |
| SAN client         | SAN client is a NetBackup client on which the Fibre Transport service is activated. SAN Client acts as Initiator of FT pipes.  |
| FT media server    | FT media server is a NetBackup media server on which the Fibre Transport services are activated. FT media server acts as Target of FT pipes.   |
| FT Service Manager | FT Service Manager (FSM) runs in the same process as EMM. FSM interacts with the FT services that run on SAN clients and on FT media servers. FSM discovers, configures, and monitors FT resources and events.   |
| Target Mode Driver | Target mode driver replaces the default, initiator mode driver. Target mode applies only to QLogic HBAs.   |

- Enter an Enterprise Client license key on Master server to activate SAN Client.
- PBX service must run on the SAN clients.
- Only 64bit Solaris SPARC and Linux x86\_64 platforms are supported as Fibre Transport servers.
- Define the zones on the switch so that the client(s) and server(s) are in the same zone. The Fibre Transport zone (or backup zone) should include only specific HBA ports of the hosts that use Fibre Transport.
- For the connections to the SAN clients, use a QLogic HBA that NetBackup supports for Fibre Transport. For these HBAs, you must configure them to use the NetBackup target mode driver.
- HBAs and their drivers must support 256K size buffers for data transfer.
- NetBackup master server and all NetBackup media servers that use the feature must be at NetBackup 6.5 or later.

- No special installation is required for the core NetBackup Fibre Transport components.
- Step1: Configure FT media server
  1. Start nbhba mode on the media server(via nbftsrv\_config –nbhba)
  2. Mark the HBA ports(via nbhba –modify)
  3. Configure the FT services(via nbftsrv\_config)
- Step 2: Configure SAN client
  1. Configure firewalls on SAN clients
  2. Configure SAN client drivers
  3. Configure the SAN client FT service(via bpcIntcmd -sanclient 1)
  4. Start the SAN client FT service (via bp.start\_all except windows)

# Example Diagram : SAN Client FT Media Servers Configuration



```
root@srtsf2 # nbftsrv_config -nbhba
```

Start nbhba mode on the media server

```
Installing nbhba driver.  
Uninstalled WinDriver for FT Server mode.  
Waiting for driver references to ql2300_stub to free up (this may take some time).
```

```
.....  
Done adding driver.  
Installed driver for nbhba mode.  
MUST REBOOT TO COMPLETE INSTALLATION.  
root@srtsf2 #
```

initiator mode

```
root@srtsf2 # nbhba -l  
1 2312 21:00:00:E0:8B:86:AF:24 " 0 0 10a  
2 2312 21:01:00:E0:8B:A6:AF:24 " 1 0 10a
```

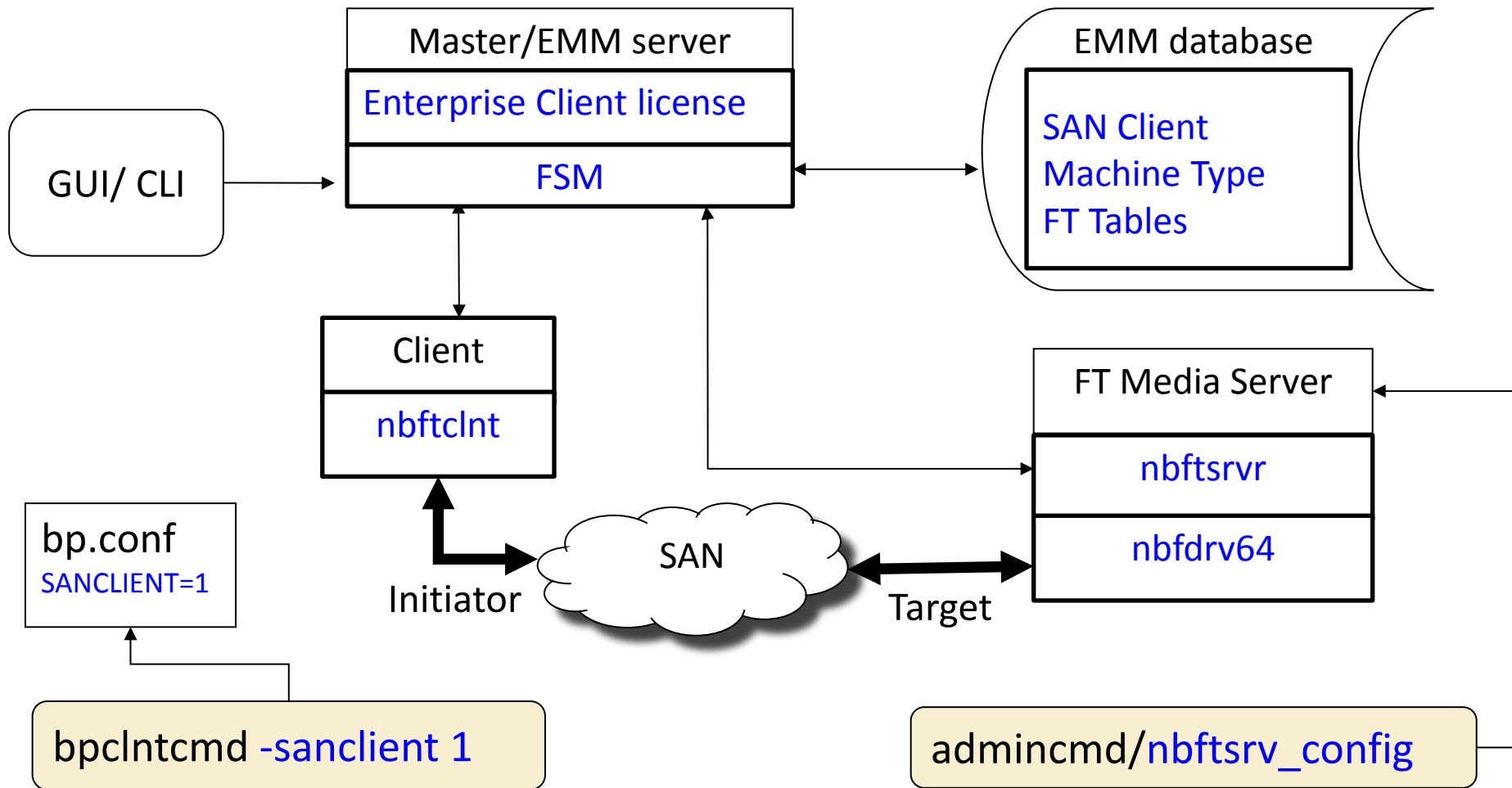
```
root@srtsf2 # nbhba -modify -split wwn 21:00:00:E0:8B:86:AF:24 -mode target  
Modified port with WWN 21:00:00:E0:8B:86:AF:24  
root@srtsf2 # nbhba -L
```

Mark the specific HBA port

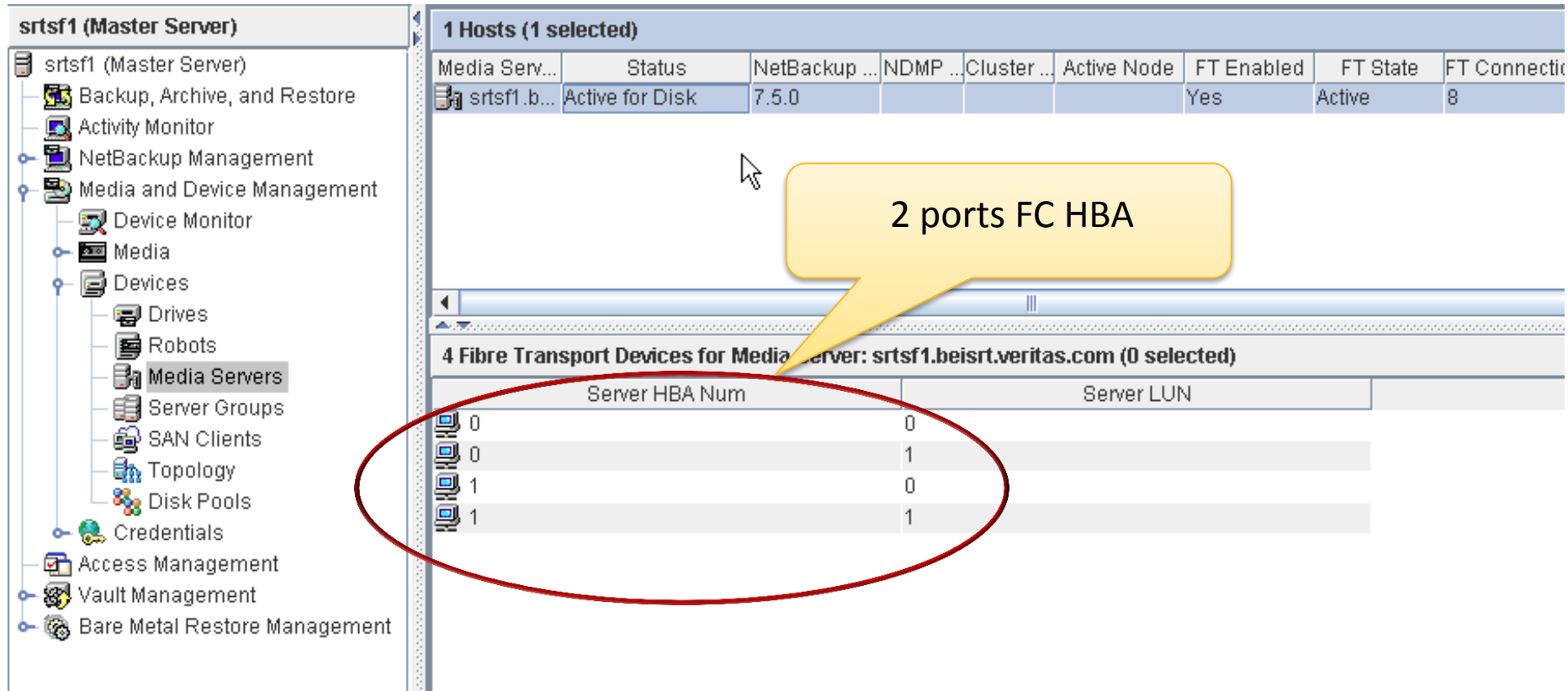
```
Card #1  
HBA Index #1  
Device ID = 2312  
World Wide Name = 21:00:00:E0:8B:86:AF:24  
Model Name = ""  
Port = 0  
Mode = target (designated for FT Server)(810a)  
HBA Index #2  
Device ID = 2312  
World Wide Name = 21:01:00:E0:8B:A6:AF:24  
Model Name = ""  
Port = 1  
Mode = initiator (designated for other use)(10a)  
root@srtsf2 # nbhba -l  
1 2312 21:00:00:E0:8B:86:AF:24 " 0 1 810a  
2 2312 21:01:00:E0:8B:A6:AF:24 " 1 0 10a
```

target mode driver binds to the marked HBA port

# Whiteboards: SAN Client Components and configuration



# Example Diagram : SAN Client Media Servers View



The screenshot displays the Symantec NetBackup console interface. On the left is a tree view for 'srtsf1 (Master Server)' with categories like Backup, Activity Monitor, NetBackup Management, Media and Device Management, and Devices. The 'Media Servers' folder is selected. The main pane shows '1 Hosts (1 selected)' with a table of server details. Below that, a section titled '4 Fibre Transport Devices for Media Server: srtsf1.beisrt.veritas.com (0 selected)' contains a table of HBA and LUN configurations. A red oval highlights the HBA and LUN entries, and a yellow callout bubble points to them with the text '2 ports FC HBA'.

| Media Serv... | Status          | NetBackup ... | NDMP ... | Cluster ... | Active Node | FT Enabled | FT State | FT Connecti... |
|---------------|-----------------|---------------|----------|-------------|-------------|------------|----------|----------------|
| srtsf1.b...   | Active for Disk | 7.5.0         |          |             |             | Yes        | Active   | 8              |

| Server HBA Num | Server LUN |
|----------------|------------|
| 0              | 0          |
| 0              | 1          |
| 1              | 0          |
| 1              | 1          |

# Example Diagram : SAN Client SAN Client View



**2 SAN Client(s) (1 selected)**

| Name   | State  | Usage Prefere... | Num FT Media Servers | Backup Wait Period | Restore Wait Period |
|--------|--------|------------------|----------------------|--------------------|---------------------|
| srtsf3 | Active | Preferred        | 1                    | 15                 | 5                   |
| srtsf6 | Active | Preferred        | 1                    | 15                 | 5                   |

**2 Fibre Transport Devices seen by the SAN Client(s)**

| Client HBA Num | Media Server              | Server HBA Num | Server LUN | Device State |
|----------------|---------------------------|----------------|------------|--------------|
| 510            | srtsf1.beisrt.veritas.com | 1              | 1          | Active       |
| 510            | srtsf1.beisrt.veritas.com | 1              | 0          | Active       |

If SAN client operating system is configured correctly, it recognizes each media server HBA port in target mode as two ARCHIVE Python devices.

1. Delete the SAN media server on Master
2. Uninstall the SAN media server software
3. Prepare for Fibre Transport
4. Connect the storage to the FT media server host
5. Install the NetBackup media server software
6. Configure the FT media servers
7. Install the NetBackup client software
8. Configure the SAN client
9. Configure alternate server restore

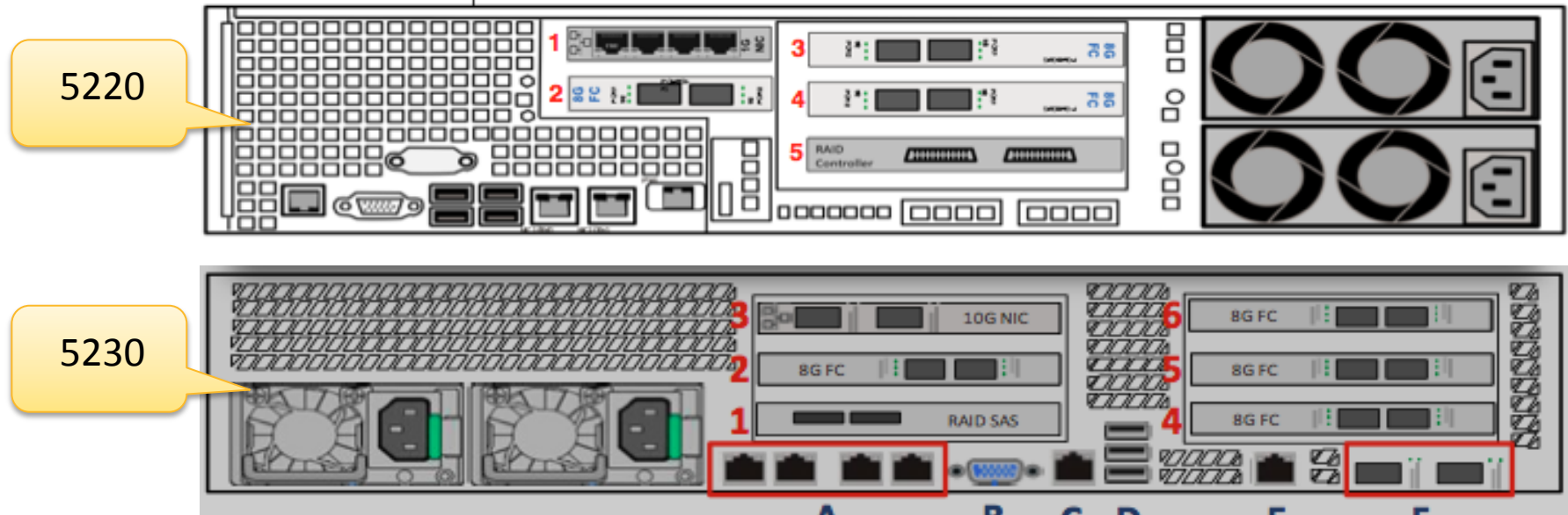
Note: For detailed information, please refer to the NetBackup 7.6 SAN Client Guide.



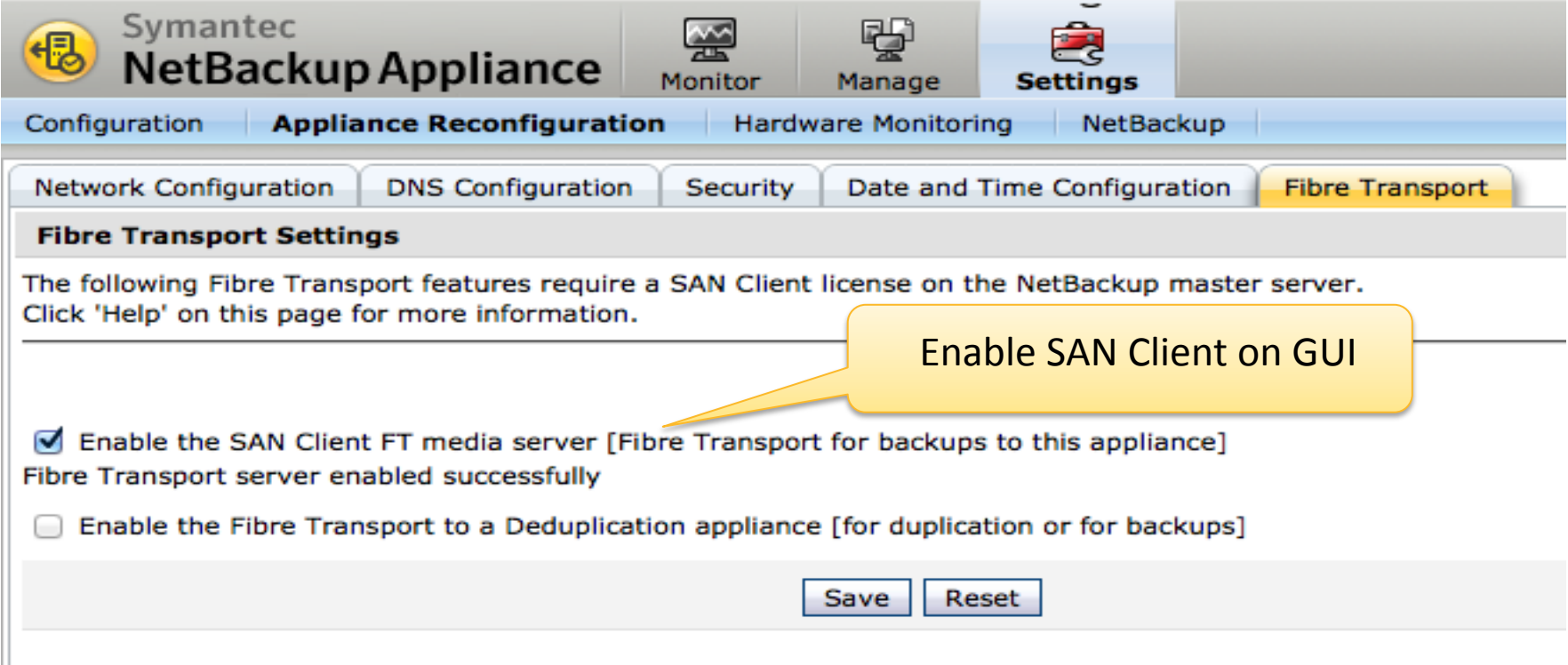
# Whiteboards: SAN Client 52x0 Appliances



- 52x0 Appliances support Fibre Transport.
  - In 5220, this feature requires fibre channel HBAs to be installed in slot 2 or slot 4
  - In 5230, HBAs should be installed in slot 5 or slot 6.
  - Port 1 of the FC HBA in these slots must be configured for the Target mode ; Port 2 will remain in initiator (normal) mode.
- Fibre Transport pipes are not storage-style multipath links. Supported job types will automatically use any available FT pipe.



# Example Diagram : SAN Client Fibre Transport Settings on 52x0 Appliance



Symantec  
**NetBackup Appliance**

Monitor Manage Settings

Configuration **Appliance Reconfiguration** Hardware Monitoring NetBackup

Network Configuration DNS Configuration Security Date and Time Configuration **Fibre Transport**

**Fibre Transport Settings**

The following Fibre Transport features require a SAN Client license on the NetBackup master server. Click 'Help' on this page for more information.

Enable the SAN Client FT media server [Fibre Transport for backups to this appliance]  
Fibre Transport server enabled successfully

Enable the Fibre Transport to a Deduplication appliance [for duplication or for backups]

Save Reset

Enable SAN Client on GUI

```
nb5230113.Settings> FibreTransport SANClient Enable
WARNING: Running this operation will restart the NetBackup
daemons, resulting in currently running jobs to fail.
This operation may take up to 10 minutes to complete.>>
Are you sure you want to proceed? (yes/no) yes
Fibre Transport server enabled successfully
|
```

Enable SAN Client on CLISH

- FT client service and Symantec PBX service must run on all failover nodes.
- SAN client OS on every node must detect the FT media server target mode driver.
- SAN client FT service is not a cluster application. To protect a SAN client with a cluster, you must configure NetBackup so that FT connections exist to every node.
- Configuring SAN clients in a cluster:
  - Install NetBackup client software on each failover node
  - Configure the SAN client on each failover node
  - Register the virtual node name with the EMM server

- Monitor Fibre Transport activity and status by viewing the log messages that the FT processes generate. Veritas unified log (VxUL) files use a standardized name and file format for log files. An originator ID identifies the process that writes the log messages.

| Originator ID | FT processes that use the ID  |
|---------------|---|
| 199           | nbftsrvr and nbfdrv64. The media server Fibre Transport services.     |
| 200           | nbftclnt. The client Fibre Transport service.                         |
| 201           | The FT Service Manager. Runs in the Enterprise Media Manager service. |

# Example Diagram : SAN Client Fibre Transport Properties – Master server



FT properties control how your SAN clients use the Fibre Transport services for backups. Master properties apply to all SAN clients.

The screenshot shows the 'Master Server Properties: srtsf1' dialog box with the 'Fibre Transport' tab selected. The left-hand navigation pane lists various properties, with 'Fibre Transport' highlighted. The main content area is titled 'Fibre Transport' and includes a 'Defaults' button. Below the title, there is an explanatory text: 'Indicate how you would like NetBackup to use FT devices. These settings indicate the default behavior when SAN Clients use FT transport. These usage preferences can be over-ridden on per client basis.' Three radio buttons are present: 'Preferred' (selected), 'Always', and 'Never'. Under 'Preferred', there is a description: 'Backups and restores for SAN Clients will use FT transport if available. If a FT device is not available, data transfer will proceed using LAN.' Below this, a sub-section titled 'Waiting period to re-try before switching to LAN transport.' contains two spinners: 'Backup:' set to 15 minutes and 'Restore:' set to 5 minutes. Under 'Always', the text reads: 'Backups and restores of SAN Clients will wait until a FT device is available.' Under 'Never', the text reads: 'Backups and restores of SAN Clients will not use FT transport.'

# Example Diagram : SAN Client Host Properties – FT Media server



**Fibre Transport** properties apply to the SAN client or clients that the selected media servers back up.

The screenshot shows the 'Media Server Properties' dialog box for the server 'srtsf1.beisrt.veritas.com'. The 'Fibre Transport' tab is selected in the left-hand tree view. The main area of the dialog is titled 'Fibre Transport' and contains the label 'Maximum concurrent FT connections:'. Below this label is a numeric spinner control with the value '8' displayed in the text box. A mouse cursor is pointing at the spinner's arrow buttons.

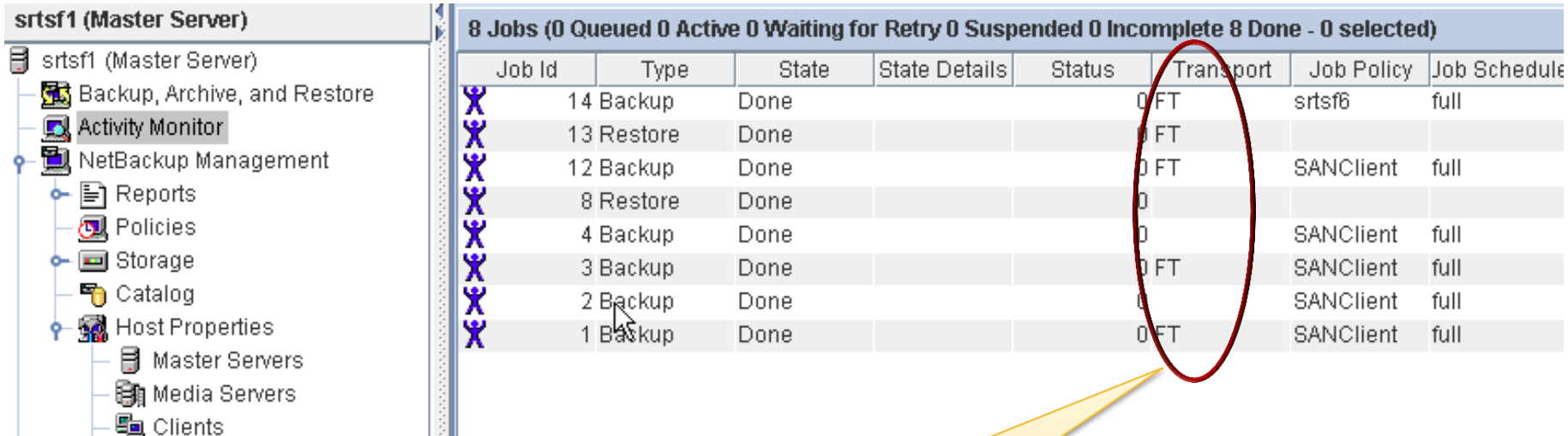
# Example Diagram : SAN Client

## Host Properties – SAN Client



Fibre Transport client properties apply to the selected SAN clients.

# Example Diagram : SAN Client Jobs Display



The screenshot shows the Symantec NetBackup console interface. On the left is a tree view of the 'srtsf1 (Master Server)' with categories like 'Backup, Archive, and Restore', 'Activity Monitor', 'NetBackup Management', 'Reports', 'Policies', 'Storage', 'Catalog', 'Host Properties', 'Master Servers', 'Media Servers', and 'Clients'. The main window displays the 'Jobs' tab with a summary: '8 Jobs (0 Queued 0 Active 0 Waiting for Retry 0 Suspended 0 Incomplete 8 Done - 0 selected)'. Below this is a table with columns: Job Id, Type, State, State Details, Status, Transport, Job Policy, and Job Schedule. A red circle highlights the 'Transport' column, which contains 'FT' for jobs 14, 13, 12, 8, 3, 2, and 1, and is blank for job 4. A yellow callout bubble points to this column.

| Job Id | Type    | State | State Details | Status | Transport | Job Policy | Job Schedule |
|--------|---------|-------|---------------|--------|-----------|------------|--------------|
| 14     | Backup  | Done  |               | 0      | FT        | srtsf6     | full         |
| 13     | Restore | Done  |               | 0      | FT        |            |              |
| 12     | Backup  | Done  |               | 0      | FT        | SANClient  | full         |
| 8      | Restore | Done  |               | 0      |           |            |              |
| 4      | Backup  | Done  |               | 0      |           | SANClient  | full         |
| 3      | Backup  | Done  |               | 0      | FT        | SANClient  | full         |
| 2      | Backup  | Done  |               | 0      |           | SANClient  | full         |
| 1      | Backup  | Done  |               | 0      | FT        | SANClient  | full         |

**Transport** column in the **Jobs** tab window shows the type of transport between the SAN client and the NetBackup media server: **FT** for Fibre Transport or blank for inactive or for a LAN.



# Example Diagram : SAN Client Job Details Display



Job ID: 12 Job state: Done

Job Overview Detailed Status

Attempt: 1

Job PID: 1313

Storage unit: Bdisk1

Media server: srtsf1.beisrt.veritas.com KB per second: 72311

Transport type: **Fibre Transport**

Status:

```
2013-11-30 14:15:27 - Info bptm (pid=1315) start
2013-11-30 14:15:28 - Info bptm (pid=1315) using 2
2013-11-30 14:15:28 - Info bptm (pid=1315) using 16
2013-11-30 14:15:28 - Info bptm (pid=1315) Using 262144 data buffer size for FT
2013-11-30 14:15:28 - Opening Fibre Transport connection, Backup Id: srtsf3_1385792123
2013-11-30 14:15:30 - Info bpbrm (pid=1313) from client srtsf3: TRV - [/etc/mnttab] is on file system
2013-11-30 14:15:30 - Warning bpbrm (pid=1313) from client srtsf3: WRN - Could not reset access
2013-11-30 14:15:33 - Info bptm (pid=1315) start backup
2013-11-30 14:15:34 - Info bpbrm (pid=1313) from client srtsf3: TRV - [/etc/svc/volatile] is in a differ
2013-11-30 14:15:34 - Info bpbrm (pid=1313) from client srtsf3: TRV - [/etc/passwd/passwd.de
```

Current Kilobytes written: 120832 Estimated Kilobytes:  
Current Files written: 3316 Estimated Files:

Transport Type field in the header area shows the same information as the Transport column in the Jobs tab.

Messages in the Status window show the status of jobs that use FT transport.



## Best Practices

- Do not use the UNIX kill -9 command and option to stop the nbfdv64 process.
- SAN clients cannot also be NetBackup servers.
- FlashBackup and Windows Hyper-V do not support FT restores.
- Do not use the NetBackup master server as an FT media server. Data transfer consumes system resources and severely degrades NetBackup management performance.
- Client-side deduplication not supported by SAN client.
- The minimum optimal number of data streams between a SAN Client and a FT Media server is 2 streams per available FT target port.
- Maximum number of FT pipes supported per appliance / media server is 32.
- On the Linux x86\_64 computers that host FT media servers, Symantec recommends that you use 20 or fewer pipes concurrently.
- Maximum recommended simultaneous client connections per target port is 4 or 5. Default value is 2.

- FT Backup Zone should include only the Fibre Transport traffic between the SAN clients and FT media servers.
- Symantec recommends creating zones with only a **single** initiator per zone. **Multiple** targets in a single zone are acceptable, only if all of the targets are similar.
- Be aware of performance degradation when a port is configured for multiple zones.
- For fault tolerance, spread connectivity across HBA cards and not ports.
- It is recommended to perform SAN zoning based on WWN.
- To promote multistream throughput, each SAN client should detect all target mode devices of HBA port or ports in the zone.
- Whenever possible avoid using ISLs between SAN Clients and the Fibre Transport Media Servers with which they communicate.

- Best practices: NetBackup SAN Client

<http://www.symantec.com/docs/DOC6469>

- NetBackup SAN Client and Fibre Transport Troubleshooting Guide

<http://www.symantec.com/docs/TECH51454>

- SAN Client Deployment - Best Practices and Performance Metrics

<http://www.symantec.com/docs/TECH54778>

- About protecting against SAN client failures

<http://www.symantec.com/business/support//index?page=content&pmv=print&impressions=&viewlocale=&id=HOWTO90003>

# Thank You!

Symantec Backup and Recovery Technical Services