

VersaStack Solution for Data Protection with an Integrated IBM Tape Library



This document describes how to configure a VersaStack data protection solution using the Cisco Unified Computing System™ (Cisco UCS®) and an IBM TS4300 Tape Library with several common backup and restore software options.

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Introduction

IBM Linear Tape Open (LTO) Ultrium tape technology is designed for backup and recovery operations as well as for the high demands of archive and storage operations for less active data in open systems environments. This proven tape technology has been enhanced in the new IBM LTO Generation 8 tape drive to help provide increased capacity, performance, and reliability compared to previous LTO tape generations.

This document provides a framework for deploying LTO technology within an integrated IBM TS4300 Tape Library in a converged environment. The document provides detailed installation and configuration steps, focusing on scenarios that help optimize deployment and utilization for small and large enterprises. It presents best practices for connecting and configuring the solution as follows:

- Cisco MDS configuration
- Cisco UCS configuration
- Microsoft Windows or Linux configuration
- VersaStack data protection solution configuration using Commvault, IBM Spectrum Protect, Veeam, and Veritas NetBackup

Technology overview

This section introduces the technologies used in the solution described in this document.

VersaStack

IBM and Cisco have teamed to offer an innovative converged infrastructure solution named VersaStack™. Cisco and IBM have thoroughly validated and verified the VersaStack solution architecture and its many use cases and created a portfolio of detailed documentation, information, and references to assist customers in transforming their data centers to this shared infrastructure model. The documentation includes the following items:

- Best practices architectural design
- Workload sizing and scaling guidance
- Implementation and deployment instructions
- Technical specifications (rules for what is, and what is not, a VersaStack configuration)
- Frequently asked questions (FAQs) or questions and answers (Q&A)
- Cisco® Validated Designs and IBM Redbooks focused on a variety of use cases

Converged infrastructure solutions enable enterprises to easily and cost-effectively scale computing, network, and storage capacity as needed to reduce design, deployment, and management overhead; lower total cost of ownership (TCO); and simplify scalability.

As part of their ongoing collaboration spanning more than 15 years and tens of thousands of shared customers, IBM and Cisco offer VersaStack converged infrastructure solutions. VersaStack brings together Cisco UCS Integrated Infrastructure (including Cisco UCS servers, Cisco Nexus® switches, and Cisco UCS Director management software) with market-leading IBM FlashSystem and Storwize storage solutions. Now IBM tape, through the TS4300 Tape Library, can be integrated into the solution. VersaStack supports a variety of Cisco and IBM component options that enable enterprises to easily build converged infrastructure solutions to address the full range of application workloads and business use cases.

The VersaStack components are connected and configured according to the best practices of both Cisco and IBM and provide an excellent platform for running a variety of enterprise workloads with confidence. The reference architecture discussed in this document uses Cisco Nexus 9000 Series Switches for the switching element. VersaStack can be scaled up for greater performance and capacity (by adding computing, network, and storage resources individually as needed), or it can be scaled out for environments that need multiple consistent deployments (by rolling out additional VersaStack solutions).

One of the main benefits of VersaStack is the capability to maintain consistency at scale. Each of the component families (Cisco UCS, Cisco Nexus, and IBM Storage) offers platform and resource options to scale the infrastructure up or down, while supporting the features and functions that are required by the configuration and connectivity best practices for VersaStack.

A VersaStack data protection solution is an excellent addition to the VersaStack infrastructure solutions. It is not limited to this type of deployment, and it can be deployed in any data center.

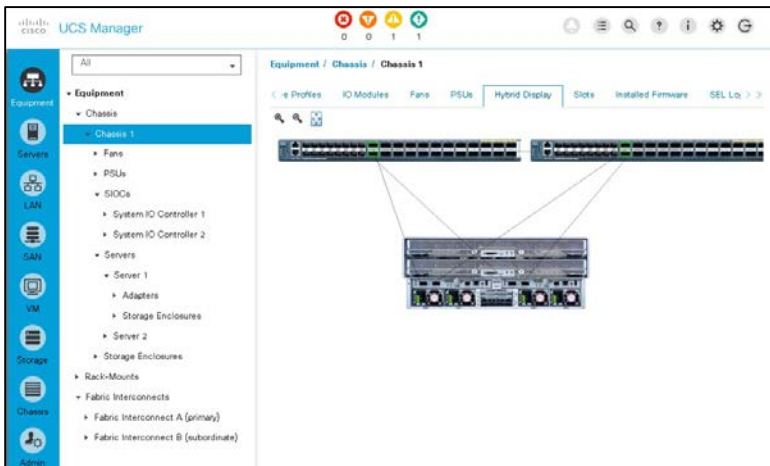
Cisco Unified Computing System

Cisco UCS is a state-of-the-art data center platform that unites computing, network, storage access, and virtualization resources into a single cohesive system.

The main components of Cisco UCS are described here:

- **Computing:** The system is based on an entirely new class of computing system that incorporates rack-mount and blade servers using Intel® Xeon® processor CPUs. The Cisco UCS servers offer the patented Cisco Extended Memory Technology to support applications with large data sets and allow more virtual machines per server.
- **Network:** The system is integrated onto a low-latency, lossless, 10- or 40-Gbps unified network fabric. This network foundation consolidates LANs, SANs, and high-performance computing (HPC) networks, which are separate networks today. The unified fabric lowers costs by reducing the number of network adapters, switches, and cables, and by decreasing the power and cooling requirements.
- **Virtualization:** The system unleashes the full potential of virtualization by enhancing the scalability, performance, and operational control of virtual environments. Cisco security, policy enforcement, and diagnostic features are now extended into virtualized environments to better support changing business and IT requirements.
- **Storage access:** The system provides consolidated access to both SAN storage and network-attached storage (NAS) over the unified fabric. By unifying the storage access layer, Cisco UCS can access storage over Ethernet (with Network File System [NFS] or Small Computer System Interface over IP [iSCSI]), Fibre Channel, and Fibre Channel over Ethernet (FCoE). This approach provides customers with a choice for storage access and investment protection. In addition, server administrators can pre-assign storage-access policies for system connectivity to storage resources, simplifying storage connectivity and management for increased productivity.

Figure 1. Cisco UCS Manager



The Cisco UCS consists of the following components:

- [Cisco UCS Manager](#) provides unified, embedded management of all Cisco UCS software and hardware components (Figure 1).
- [Cisco UCS 6000 Series Fabric Interconnects](#) are line-rate, low-latency, lossless, 10-Gbps Ethernet and FCoE interconnect switches providing the management and communication backbone for Cisco UCS.
- [Cisco UCS 5100 Series Blade Server Chassis](#) supports up to eight blade servers and up to two fabric extenders in a six-rack unit (6RU) enclosure.
- [Cisco UCS B-Series Blade Servers](#) increase performance, efficiency, versatility, and productivity with Intel-based blade servers.
- [Cisco UCS C-Series Rack Servers](#) deliver unified computing in an industry-standard form factor to reduce TCO and increase agility.
- [Cisco UCS S-Series Storage Servers](#) deliver unified computing in an industry-standard form factor to address data-intensive workloads with reduced TCO and increased agility.
- [Cisco UCS adapters](#), with wire-once architecture, offer a range of options to converge the fabric, optimize virtualization, and simplify management.

Cisco UCS is designed to deliver:

- Reduced TCO and increased business agility
- Increased IT staff productivity through just-in-time provisioning and mobility support
- A cohesive, integrated system that unifies the technology in the data center
- Industry standards supported by a partner ecosystem of industry leaders
- Unified, embedded management for easy-to-scale infrastructure

IBM TS4300 Tape Library

The IBM TS4300 Tape Library is a next-generation tape storage solution designed for the high demands of backup tape storage to help midsize enterprises respond to future challenges (Figure 2).

In addition to traditional tape use cases, the TS4300 helps clients handle the growing data demands of new tape use cases such as big data, cloud, the Internet of Things (IoT), media and entertainment (M&E), digital video surveillance (DVS), and active file archiving. Tape storage offers a less costly long-term storage option than disk drives or flash memory, and data is stored on tape kept offline or on write-once media and is almost impossible to hack.

IBM now offers the IBM TS4300 Tape Library with support for encryption, data-path failover, and LTO Ultrium 8 drives, delivering increased reliability, security, capacity, and performance to help clients meet their growing data requirements. The system used for this document was configured with one LTO Ultrium 7 drive connected using Fibre Channel. (The deployment considerations and steps are the same for LTO8 tape drives as for the TS4300 used here.)

Figure 2. IBM TS4300



Solution design

VersaStack data protection solutions on the Cisco UCS S3260 Storage Server are designed to address the data protection needs of modern data centers. The increasing percentage of virtualized workloads, the dramatic increase in the size and amount of data, and the changes in the ways that companies operate and work with data have an immense impact on the requirements for data protection solutions. With the backup window continuing to decrease in organizations and recovery-point-objective (RPO) and recovery-time-objective (RTO) requirements now in the range of minutes to hours, technologies such as compression, deduplication, replication, and backup to disk are essential in every design. At the same time, tape continues to be a relevant backup destination. IDC estimates that 49 percent of all organizations use tape for backup and recovery operations.

The features and functions provided by IBM Spectrum Protect, combined with the features and functions provided by the Cisco UCS S3260 Storage Server, create a powerful solution for fast backup and fast restore operations.

For long data retention periods and for less frequently accessed data, IBM tape libraries can be used on Cisco UCS S3260 Storage Servers. With the combination of IBM and Cisco technology, you can easily scale from tens of terabytes (TB) to multiple petabytes (PB) of protected data.

Consider the following factors when backing up a data set to disk or tape:

- Disk storage is well suited for short retention periods; tape is better suited for longer retention periods.
- Disk storage is well suited for data staging; tape is good for long-term storage.
- Disk storage is better suited for low-volume incremental backups.
- Incremental forever backups are well suited for storage on tape.
- Restoration from disk is usually faster than from tape.
- If client backup operations are too slow to keep the tape in motion, send the backups to disk.
- If the backups are small, send the backups to disk.
- Staging or data lifecycle management policies can later move backup images to tape.
- Offline tape media provides better protection against corruption and malicious encryption (malware and ransomware).

Figure 3. VersaStack solution

You have many options when determining how to install a backup server such as an IBM Spectrum Protect server on a Cisco UCS S3260 server with an IBM tape library.

One option is to position the VersaStack data protection solution in a central location on the physical network to allow access from everywhere with the required bandwidth. With this deployment options, only a few servers may be required, and the volume of network traffic will typically be very high. The client-side deduplication feature provided by some data protection software reduces the amount of data transferred over the network in most cases.

Another option is to place the backup server as close as possible to the data source. With this approach, you will need more backup servers, but the amount of network traffic on the core network will be much less.

Implementing the Cisco UCS S3260 with software such as IBM Spectrum Protect integrated into a converged infrastructure solution like VersaStack (Figure 3) provides benefits such as these:

- **Simplified management:** Data protection is part of the existing infrastructure management framework.
- **Ease of scalability:** Storage capacity and network bandwidth are managed within the converged infrastructure solution. Within Cisco UCS, you can scale from a 10-Gbps network to a 40-Gbps network to reduce the backup window. You do not need to order and pay for a 40-Gbps port on the core network from the network team. You can scale the IBM Spectrum Protect system from Small (S) to Medium (M) to Large (L) according to the scale of tier-1 storage or service-level agreement (SLA) changes from the business for applications running on the converged infrastructure solution.
- **Ease of support:** All components required to run an application and to back up and restore data are part of the same converged infrastructure solution and known by the administrator team onsite, the support team at Cisco and IBM, and the implementation partner. This approach simplifies the identification and resolution of problems such as bottlenecks and failed components.

To keep the required configuration for the IBM tape library simple, the setup described in this document connects the tape library to the Cisco MDS switches used in the VersaStack solution. The configuration principles are the same if a dedicated backup SAN is used.

Solution configuration

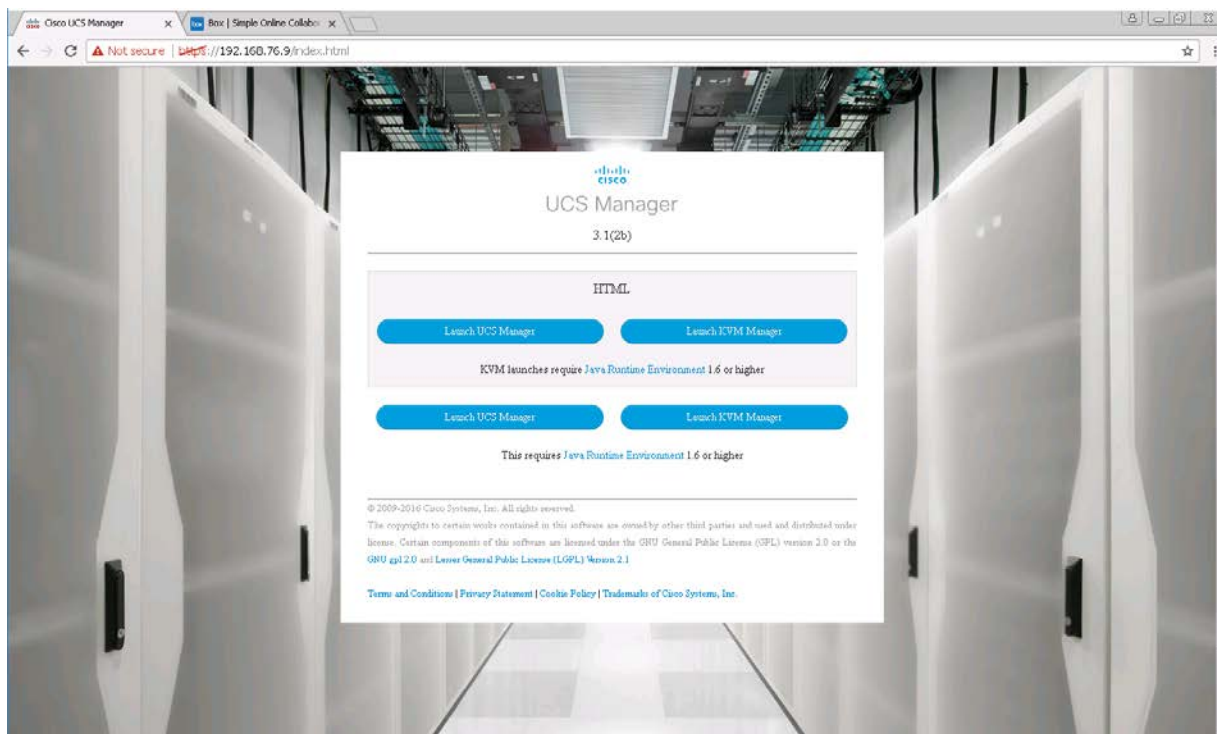
The high-level steps for configuring an IBM TS4300 Tape Library for use with Cisco UCS are as follows:

- Configure Cisco UCS and install the fnic driver in the operating system.
- Configure the IBM TS4300.
- Configure the Cisco MDS switches.
- Configure the operating system.
- Configure the application.

Configuring Cisco UCS

The setup described in this document uses a Cisco UCS managed server—in this example, the Cisco UCS S3260 Storage Server—that accesses an IBM tape library through FCoE within Cisco UCS and native Fibre Channel from Cisco UCS fabric interconnects. It uses Cisco MDS switches to connect to the tape drives and robots. This document shows how to configure the Fibre Channel connection through a virtual host bus adapter (vHBA) from the Cisco UCS server using the SAN already configured in Cisco UCS Manager.

Log on to Cisco UCS Manager as user admin or another user with administrative rights.



The first step is to check the firmware version installed on the servers used for backup to tape.

Choose the server in the Equipment area and select the Installed Firmware tab.

For a Cisco UCS S3260 server, the firmware is listed under SIOC > System IO Controller [1 or 2] > Shared Adapter.

For a Cisco UCS B-Series Blade Server or C-Series Rack Server, the firmware is listed under Adapters > Adapter [X].

Equipment / Chassis / Chassis 2

General Servers Service Profiles Fans PSUs Hybrid Display Slots **Installed Firmware** SEL Logs Power Control Monitor Connectivity F3 >

Name	Model	Running V...	Startup Ver...	Backup Ver...	Update Sta...	Activate St...
PSUs						
SIOCs						
System IO Controller 1						
Board Controller	Cisco UCS C3260 System IO Controller with VIC 1380 included	1.0.15	1.0.15	N/A	N/A	Ready
Chassis Management Contr...	Cisco UCS C3260 System IO Controller with VIC 1380 included	3.0(3a)	3.0(3a)	2.0(13a)	Ready	Ready
Shared Adapter	Cisco UCS C3260 System IO Controller with VIC 1380 included	4.1(5a)	4.1(5a)	4.1(2d)	Ready	Ready
System IO Controller 2						
Board Controller	Cisco UCS C3260 System IO Controller with VIC 1380 included	1.0.15	1.0.15	N/A	N/A	Ready
Chassis Management Contr...	Cisco UCS C3260 System IO Controller with VIC 1380 included	3.0(3a)	3.0(3a)	3.0(3S13)	Ready	Ready
Shared Adapter	Cisco UCS C3260 System IO Controller with VIC 1380 included	4.1(5a)	4.1(5a)	4.1(5S1)	Ready	Ready
Servers						
Storage Enclosure 1						
SAS Expander 1	Cisco UCS C3260 SAS Expander	04.08.01.B...	04.08.01.B...	04.08.01.B...	Ready	Ready
SAS Expander 2	Cisco UCS C3260 SAS Expander	04.08.01.B...	04.08.01.B...	04.08.01.B...	Ready	Ready

Equipment / Rack-Mounts / Servers / Server 1

General Inventory Virtual Machines Hybrid Display **Installed Firmware** SEL Logs CIMC Sessions VIF Paths Power Control Monitor Faults >

Name	Model	Running Version	Startup Version	Backup Version	Update Status	Activate Status
Adapters						
Adapter 1	Cisco UCS VIC 1385	4.1(2d)	4.1(2d)	4.1(1.0e)	Ready	Ready
BIOS	Cisco UCS C460 M4	C460M4 2.0.12b.0.09...	C460M4 2.0.12b.0.09...	C460M4 2.0.12c.0.11...	Ready	Ready
Board Controller	Cisco UCS C460 M4	16.0	16.0	N/A	N/A	Ready
CIMC Controller	Cisco UCS C460 M4	2.0(13e)	2.0(13e)	2.0(13h)	Ready	Ready
FlexFlash Controlle...		1.2 build 259-1		N/A	N/A	N/A
SAS Expander 1	SAS Expander UCS-C...	65.10.40.00	65.10.40.00	65.10.39.00	Ready	Ready
Storage Controller ...	Cisco 12G SAS C460...	24.12.1-0049	24.12.1-0049	N/A	N/A	Ready

SAN configuration is available within Cisco UCS.

Go to SAN > SAN Cloud > Fabric A/B > VSANs.

In the lab setup described here, Fab-A with VSAN 10 on Fabric A and Fab-B with VSAN 20 on Fabric B are available.

The screenshot shows the UCS Manager interface for configuring a VSAN. The breadcrumb path is **SAN / SAN Cloud / Fabric A / VSANs / VSAN Fab-A(10)**. The left sidebar shows the navigation tree with **VSAN Fab-A (10)** selected. The main content area has tabs for **General**, **Faults**, and **Events**. The **Fault Summary** shows four status icons (red X, orange Y, yellow Z, green circle) with a count of 0 for each. The **Properties** section includes:

- Name: **Fab-A**
- ID: **10**
- Fabric ID: **A**
- Network Type: **San**
- If Type: **Virtual**
- Locale: **External**
- Transport Type: **Fe**
- FCoE VLAN ID: **10**
- Operational State: **OK**
- Owner: **Local**
- FC Zoning Settings: **Disabled** (selected) / Enabled

A note at the bottom states: **Do NOT enable local zoning if fabric interconnect is connected to an upstream FC/FCoE switch.**

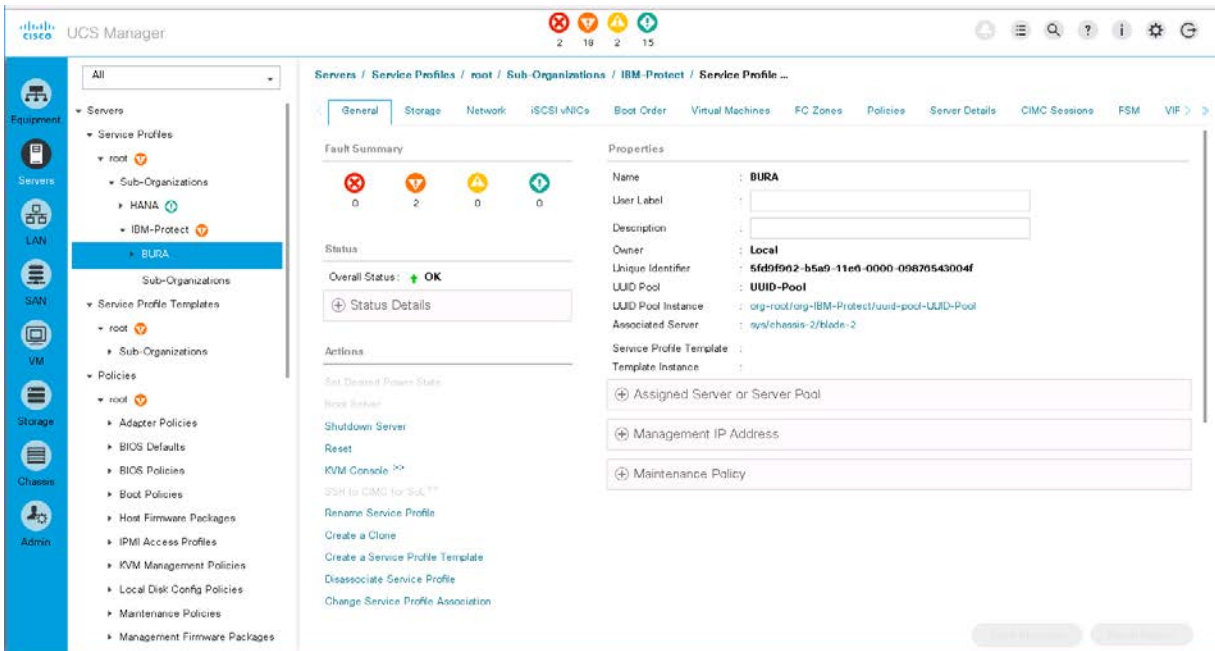
Under Pools > root > WWPN Pools, the available World Wide Port Name (WWPN) pools are listed.

The screenshot shows the UCS Manager interface for viewing WWPN Pools. The breadcrumb path is **SAN / Pools / root / WWPN Pools**. The left sidebar shows the navigation tree with **WWPN Pools** selected. The main content area displays a table of WWPN Pools:

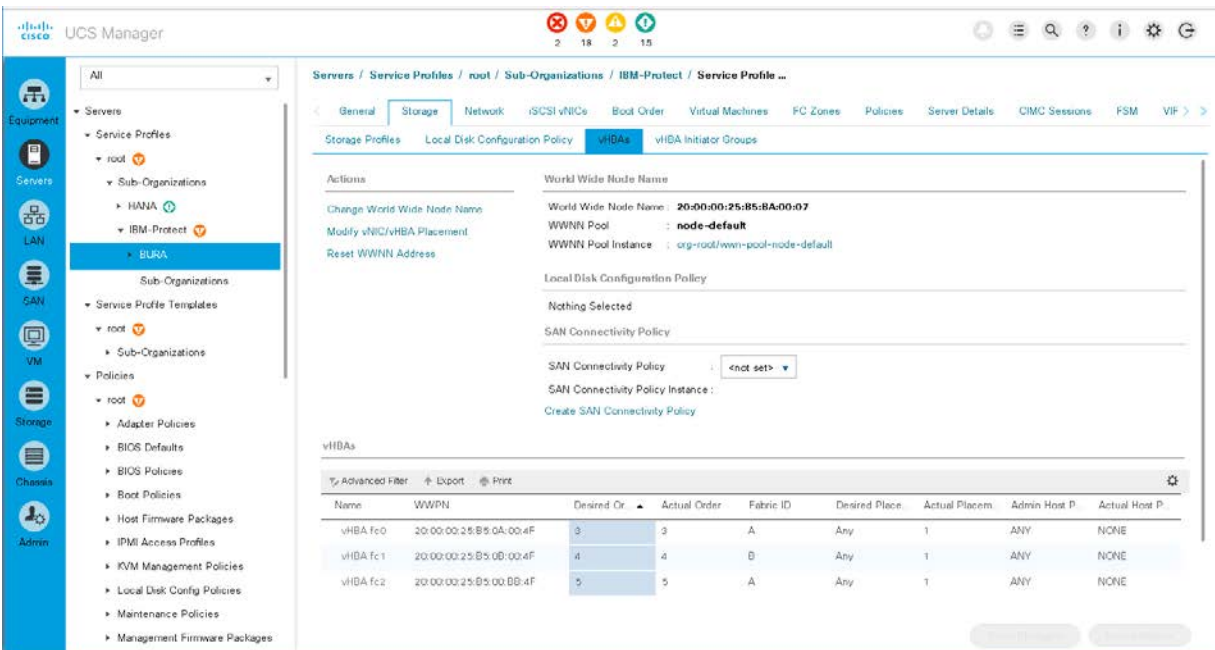
Name	Size	Assigned
WWPN Pool default	0	0
WWPN Pool WWPN-Pool-B	100	9
WWPN Pool WWPN-Pool-A	100	9

With this information, you can begin configuring the service profile.

Go to Servers > root > Sub-Organizations > IBM-Protect.



Select the Storage tab and then select vHBA.



Click Add (scroll down if necessary to see the button).

Enter **fc0** as the name.

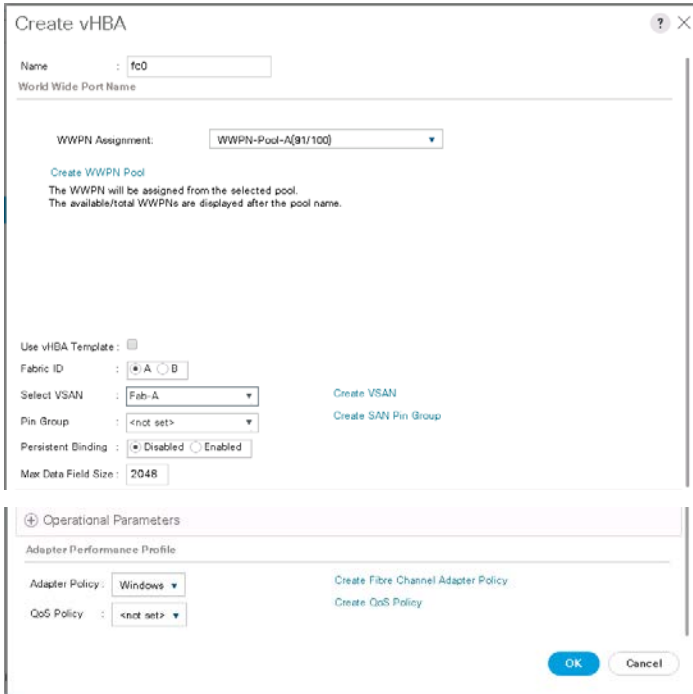
Select WWPN=Pool-A from the WWPN Assignment drop-down menu.

Select A as the fabric ID.

Select Fab-A as the VSAN.

Select Windows as the adapter policy.

Click OK.



Again click Add.

Enter **fc1** as the name.

Select WWPN-Pool-B from the WWPN Assignment drop-down menu.

Select B as the fabric ID.

Select Fab-B as the VSAN.

Select Windows as the adapter policy.

Click OK.

Create vHBA

Name :

World Wide Port Name

WWPN Assignment:

[Create WWPN Pool](#)
The WWPN will be assigned from the selected pool.
The available/total WWPNs are displayed after the pool name.

Use vHBA Template:

Fabric ID : A B

Select VSAN : [Create VSAN](#)

Pin Group : [Create SAN Pin Group](#)

Persistent Binding : Disabled Enabled

Max Data Field Size :

Operational Parameters

Adapter Performance Profile

Adapter Policy : [Create Fibre Channel Adapter Policy](#)

QoS Policy : [Create QoS Policy](#)

The screenshot shows the UCS Manager interface with the following configuration details for vHBA fc1:

- World Wide Node Name:** 20:00:00:25:85:BA:00:07
- WWNN Pool:** node-default
- WWNN Pool Instance:** org-root/wwn-pool-node-default
- Local Disk Configuration Policy:** Nothing Selected
- SAN Connectivity Policy:** <not set>
- SAN Connectivity Policy Instance:** (empty)

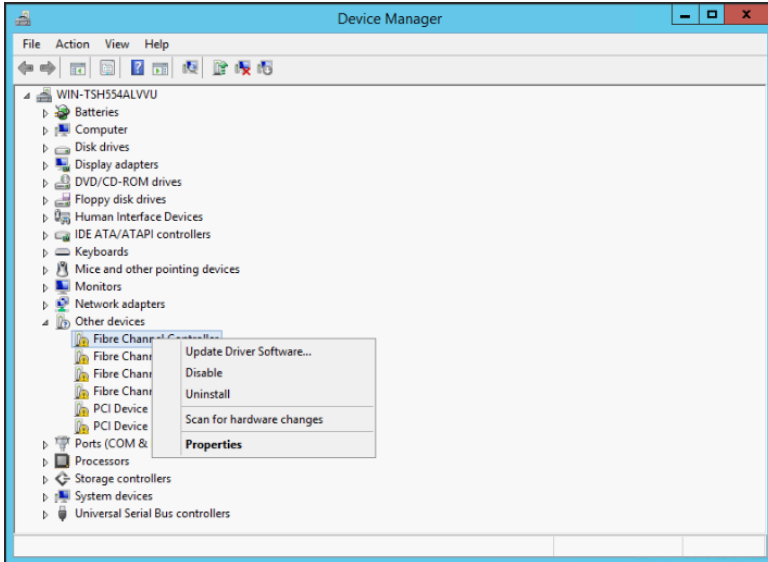
Name	WWPN	Desired Or	Actual Order	Fabric ID	Desired Place	Actual Placem	Admin Host P	Actual Host P
vHBA fc0	20:00:00:25:85:0A:00:4F	3	3	A	Any	1	ANY	NONE
vHBA fc1	20:00:00:25:85:0B:00:4F	4	4	B	Any	1	ANY	NONE

To activate the configuration changes, reboot the server.

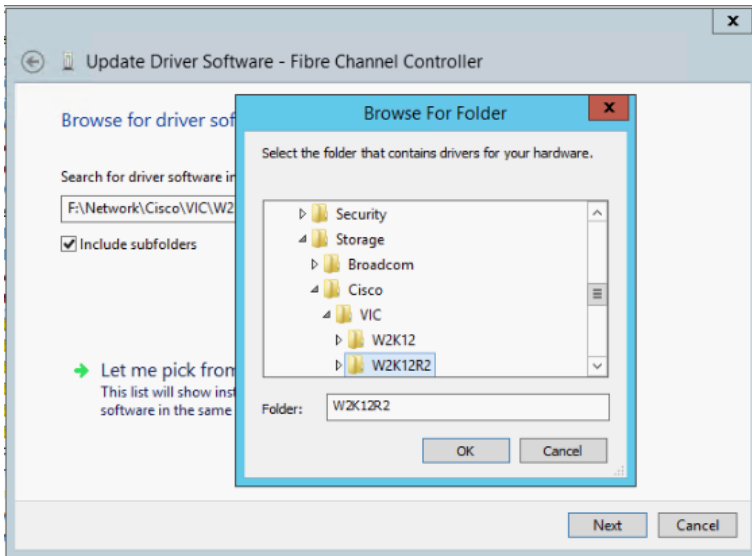
For the operating system, the Cisco fnic driver is required. Map the Cisco UCS drivers image as a CD/DVD or make the content available on the local system.

Open the Device Manager and scroll down to the unrecognized Fibre Channel controller.

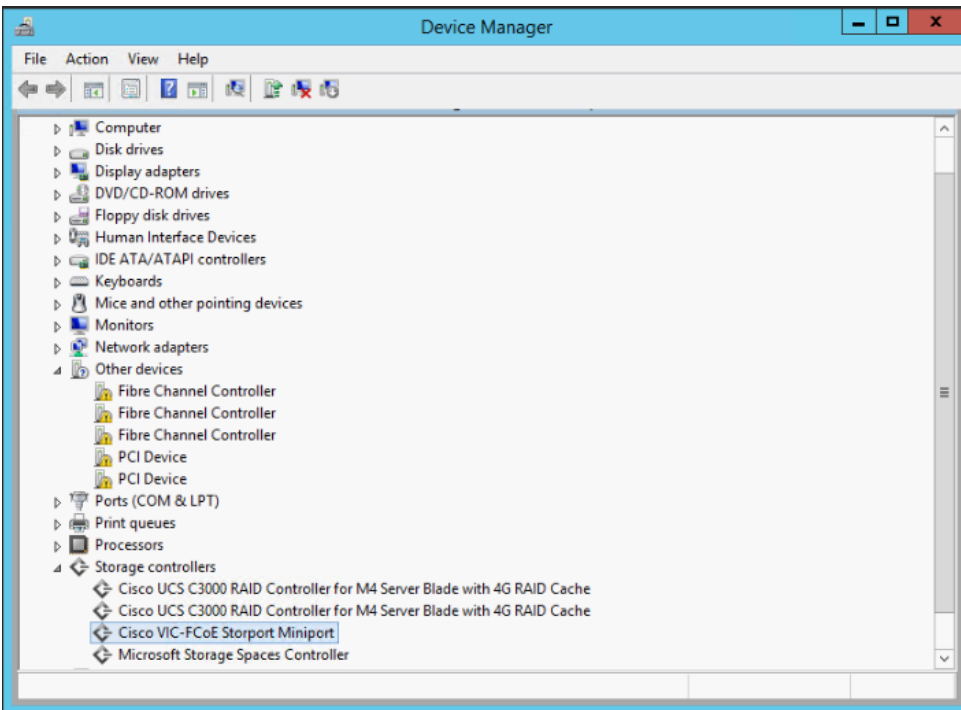
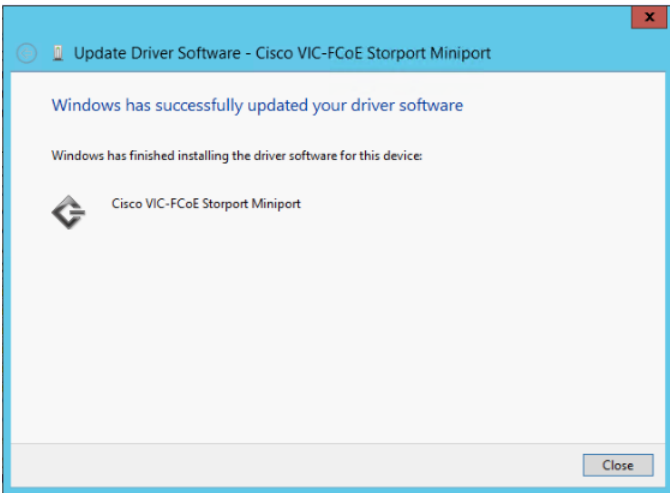
Right-click Fibre Channel Controller and select Update Driver Software.



Go to Storage > Cisco > VIC. Choose the version of Windows you are using: here, W2K12R2. Then choose x64.



The Cisco VIC-FCoE Storport Miniport driver will be installed.



For all remaining Fibre Channel controllers, select Search Automatically.

To check that the driver is loaded and the SAN configuration within Cisco UCS was successful, log on to the Cisco MDS switch and run the show flogi database command. This command will show all the Fibre Channel logins on the device. If the WWPN of the server is shown, the configuration is working; if it isn't, then reboot the server and check again.

```
mds-A# show flogi database
```

```
-----
INTERFACE          VSAN    FCID          PORT NAME          NODE NAME
-----
fc1/25              10      0x2f0500      50:00:e1:11:c2:92:b0:5c 50:00:e1:11:c2:92:b0:5b
fc1/33              10      0x2f0100      52:4a:93:7c:28:ea:a3:02 52:4a:93:7c:28:ea:a3:02
fc1/34              10      0x2f0200      52:4a:93:7c:28:ea:a3:12 52:4a:93:7c:28:ea:a3:12
fc1/35              10      0x2f0300      52:4a:93:7c:28:ea:a3:00 52:4a:93:7c:28:ea:a3:00
fc1/36              10      0x2f0400      52:4a:93:7c:28:ea:a3:10 52:4a:93:7c:28:ea:a3:10
port-channel10     10      0x2f0000      24:0a:00:de:fb:3d:1b:80 20:0a:00:de:fb:3d:1b:81
port-channel10     10      0x2f0005      20:00:00:25:b5:0a:00:04 20:00:00:25:b5:ba:00:03
port-channel10     10      0x2f0006      20:00:00:25:b5:0a:00:05 20:00:00:25:b5:ba:00:04
port-channel10     10      0x2f0007      20:00:00:25:b5:0a:00:06 20:00:00:25:b5:ba:00:05
port-channel10     10      0x2f0008      20:00:00:25:b5:0a:00:07 20:00:00:25:b5:ba:00:06
port-channel10     10      0x2f0009      20:00:00:25:b5:0a:00:4F 20:00:00:25:b5:ba:00:07
```

Total number of flogi = 11.

```
mds-A#
```

```
mds-B# show flogi database
```

```
-----
INTERFACE          VSAN    FCID          PORT NAME          NODE NAME
-----
fc1/33              20      0x4e0200      52:4a:93:7c:28:ea:a3:03 52:4a:93:7c:28:ea:a3:03
fc1/34              20      0x4e0300      52:4a:93:7c:28:ea:a3:13 52:4a:93:7c:28:ea:a3:13
fc1/35              20      0x4e0100      52:4a:93:7c:28:ea:a3:01 52:4a:93:7c:28:ea:a3:01
fc1/36              20      0x4e0400      52:4a:93:7c:28:ea:a3:11 52:4a:93:7c:28:ea:a3:11
port-channel20     20      0x4e0000      24:14:00:de:fb:33:df:00 20:14:00:de:fb:33:df:01
port-channel20     20      0x4e0005      20:00:00:25:b5:0b:00:04 20:00:00:25:b5:ba:00:03
port-channel20     20      0x4e0006      20:00:00:25:b5:0b:00:05 20:00:00:25:b5:ba:00:04
port-channel20     20      0x4e0007      20:00:00:25:b5:0b:00:06 20:00:00:25:b5:ba:00:05
port-channel20     20      0x4e0008      20:00:00:25:b5:0b:00:07 20:00:00:25:b5:ba:00:06
port-channel20     20      0x4e0009      20:00:00:25:b5:0b:00:4F 20:00:00:25:b5:ba:00:07
```

Total number of flogi = 10.

```
mds-B#
```

Configuring IBM Tape Library: Initial setup

The next step is to connect and configure the tape library.

The hardware installation of the IBM TS4300 is documented in the hardware installation guide provided by IBM.

Connect the Fibre Channel port of the Fibre Channel tape drives to one of the Cisco MDS switches: here, mds-a port fc1/25.

```
mds-A# show int bri
```

```
-----
Interface  Vsan    Admin  Admin  Status      SFP    Oper  Oper  Port
          Mode   Mode   Trunk                               Mode  Speed  Channel
          Mode                                     (Gbps)
-----
fc1/1      10     F      off    up          swl    F     16   10
fc1/2      10     F      off    up          swl    F     16   10
...
fc1/25    1     auto on    up        swl  F    8   --
...
fc1/48     1      auto   on     sfpAbsent  --     --   --   --
-----
```

```
-----
Interface                Status                Speed
                        (Gbps)
-----
sup-fc0                  up                    1
-----
```

```
-----
Interface                Status    IP Address          Speed    MTU
-----
mgmt0                    up       192.168.76.10/24   1 Gbps  1500
-----
```

```
-----
Interface                Vsan  Admin  Status      Oper  Oper  IP
                        Mode   Trunk                               Mode  Speed  Address
                        Mode                                     (Gbps)
-----
port-channel10          10    off    up          F     64    --
mds-A#
```

Configuring Cisco MDS switches

The initial setup of the Cisco MDS switches was performed as part of the VersaStack installation. This document shows only the configuration related to the tape library.

On the Cisco MDS switches, multiple VSANs can be defined. To list the VSANs already configured, run the following command:

```

mds-A# show vsan usage
2 vsan configured
configured vsans:1,10
vsans available for configuration:2-9,11-4078,4080-4093
mds-A#

```

In the configuration here, VSAN10 is used. To add port fc1/25 to VSAN10, run the following commands:

```

mds-A# conf t
mds-A(config)# vsan database
mds-A(config-vsan-db)# vsan 10 interface fc1/25
Traffic on fc1/25 may be impacted. Do you want to continue? (y/n) [n] y

```

Check that port fc1/25 is now part of VSAN10 by running the following command:

```

mds-A(config-vsan-db)# show run vsan
...
vsan database
  vsan 10 interface port-channel10
  vsan 10 interface fc1/25
  vsan 10 interface fc1/33
  vsan 10 interface fc1/34
  vsan 10 interface fc1/35
  vsan 10 interface fc1/36
...
mds-A(config-vsan-db)# exit

```

The tape drive and the server are now connected to the same VSAN, as shown here:

```

mds-A# show flogi database
-----
INTERFACE          VSAN    FCID          PORT NAME          NODE NAME
-----
fc1/25              10      0x2f0500      50:00:e1:11:c2:92:b0:5c 50:00:e1:11:c2:92:b0:5b
...
port-channel10     10      0x2f0009      20:00:00:25:b5:0a:00:4f 20:00:00:25:b5:ba:00:07

Total number of flogi = 11.

```

```
mds-A#
```

To allow the connection from the server to the tape drive, define a zone define and add it to the active zone set:

```
mds-A(config)# zone name S3260-Tape vsan 10
mds-A(config-zone)# member interface fc1/25
mds-A(config-zone)# member pwwn 20:00:00:25:b5:0a:00:4f
mds-A(config-zone)#
```

Find the active zone set to which you want to add the newly created zone:

```
mds-A(config-zone)# show zoneset active vsan 10
zoneset name VersaStack-A vsan 10
...
mds-A(config-zone)#
```

Add the newly created zone to the active zone set:

```
mds-A(config-zone)# zoneset name VersaStack-A vsan 10
mds-A(config-zoneset)# member S3260-Tape

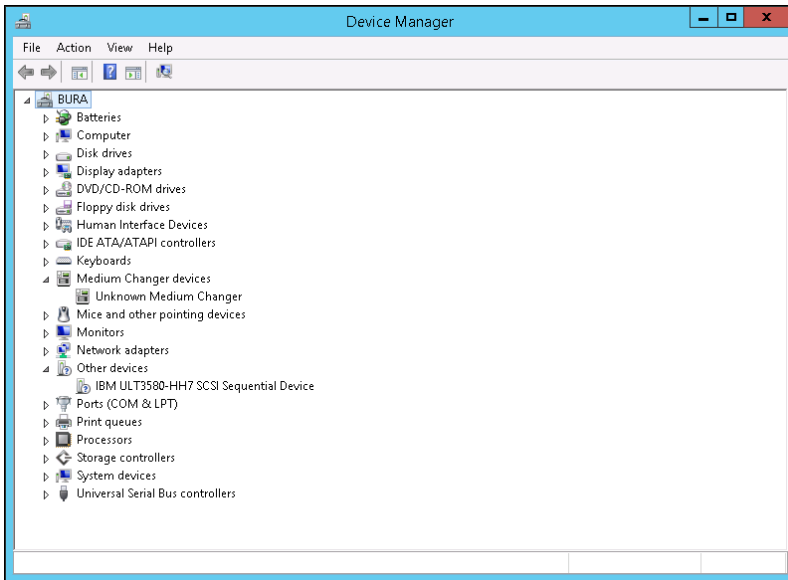
mds-A(config-zoneset)# zoneset activate name VersaStack-A vsan 10
WARNING: Specified zoneset already active
mds-A(config)#
```

The tape drive and robot are not visible to the server.

Configuring the operating system

Now configure the operating system.

Log on to the server and open the Device Manager to check the available devices.



On Windows Server 2012 R2, the drivers for the tape drive and the Medium Changer are missing. Download the correct drivers from IBM.com website. The setup in this document uses IBMTape_x64_w12_6263.zip.

```
S:\IBM\IBMTape63.x64_w12_6263>dir
Volume in drive S is Software
Volume Serial Number is 463C-E492

Directory of S:\IBM\IBMTape63.x64_w12_6263

08/30/2017  01:09 PM    <DIR>          .
08/30/2017  01:09 PM    <DIR>          ..
08/30/2017  01:09 PM    <DIR>          drivers
08/30/2017  01:09 PM                177,816 Installer.dll
08/30/2017  01:09 PM                11,928 install_exclusive.exe
08/30/2017  01:09 PM                11,928 install_nonexclusive.exe
08/30/2017  01:09 PM                11,928 uninst.exe
                4 File(s)      213,600 bytes
                3 Dir(s)  21,940,557,201,408 bytes free

S:\IBM\IBMTape63.x64_w12_6263>
S:\IBM\IBMTape63.x64_w12_6263>install_exclusive.exe

IBM Tape/Changer device driver  installer. Version: 6.2.6.3x64
```



```

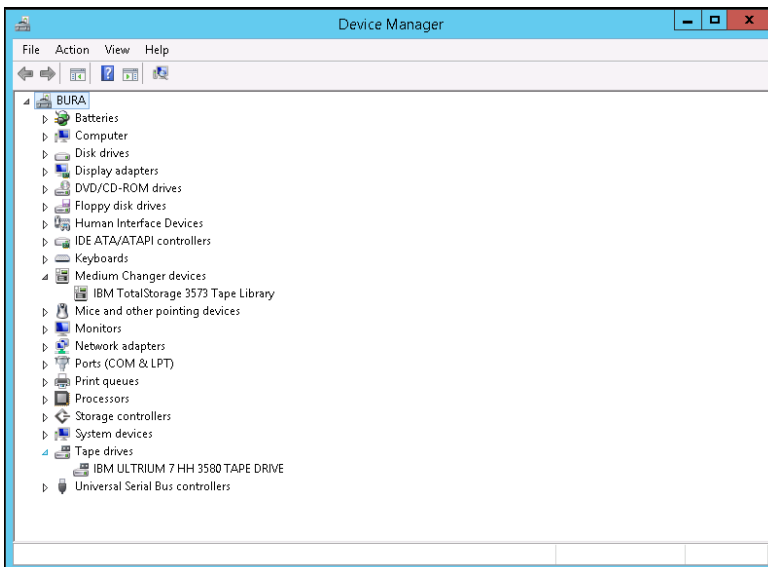
Installing Changer Bus Enumerator...
Successfully installed Changer Bus Enumerator
Installing Tape Bus Enumerator...
Successfully installed Tape Bus Enumerator
Installing driver for existing medium changers...
Successfully installed driver for existing medium changers
Installing driver for existing tape drives...
Successfully installed driver for existing tape drives

Sys file exists: S:\IBM\IBMTape63.x64_w12_6263\drivers\magchgrf2k12.inf
Sys file exists: S:\IBM\IBMTape63.x64_w12_6263\drivers\exctapef2k12.inf
Sys file exists: S:\IBM\IBMTape63.x64_w12_6263\drivers\ibmcgbs2k12.inf
Sys file exists: S:\IBM\IBMTape63.x64_w12_6263\drivers\ibmtpbs2k12.inf
Successfully created Tape key: System\CurrentControlSet\Services\ibmtp2k12
Successfully set ExclusiveAccess to: 1
Successfully set ReserveType to: 0
Successfully installed Changer Bus Enumerator
Successfully installed Tape Bus Enumerator
Successfully installed driver for existing medium changers
Successfully installed driver for existing tape drives
Successfully installed drivers

S:\IBM\IBMTape63.x64_w12_6263>

```

The tape drive and Medium Changer devices are now listed properly in the Device Manager.



The tape library is now ready for the data protection software.

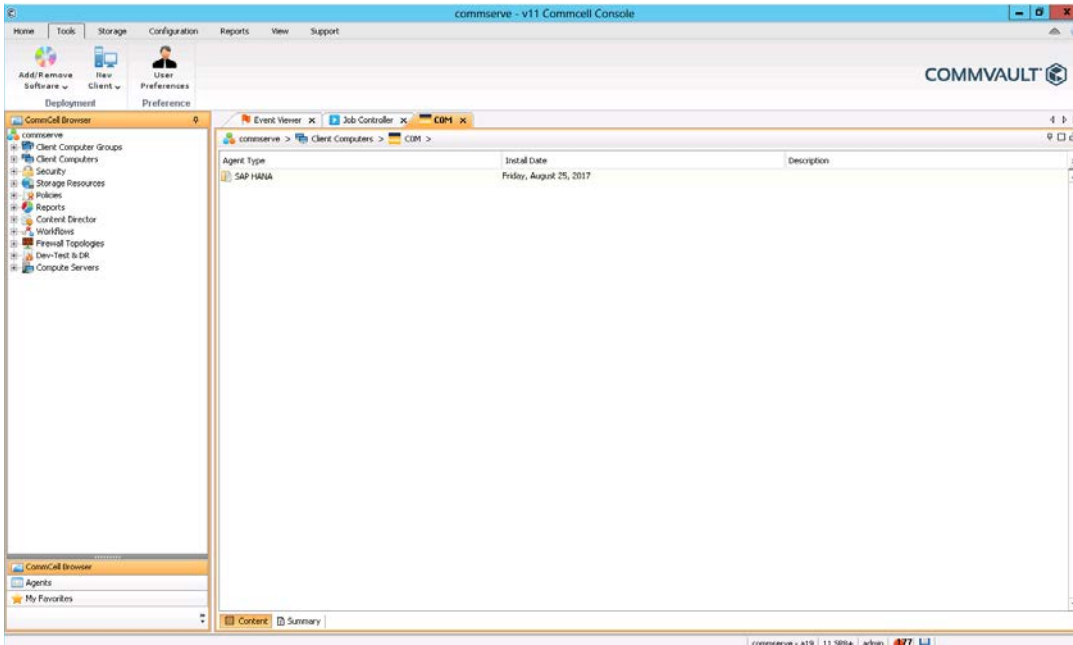
Backup software configuration

The intent of this document is to show the configuration steps required for an IBM TS4300 Tape Library on Cisco UCS and provide basic configuration information using several different data protection software options. The solutions presented here are shown in alphabetic order and represent only a subset of the available options.

This document does not replace the original product documentation provided by the software vendors.

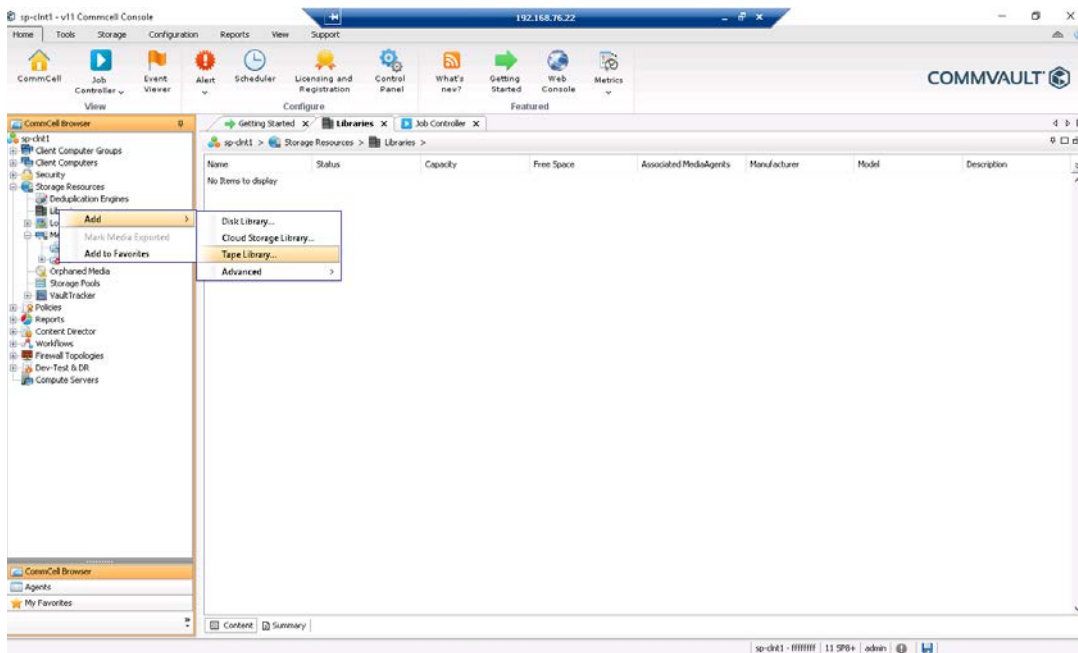
Configuring Commvault

To configure the IBM TS-Series Tape Library using Commvault, open the Commvault Commcell Console.

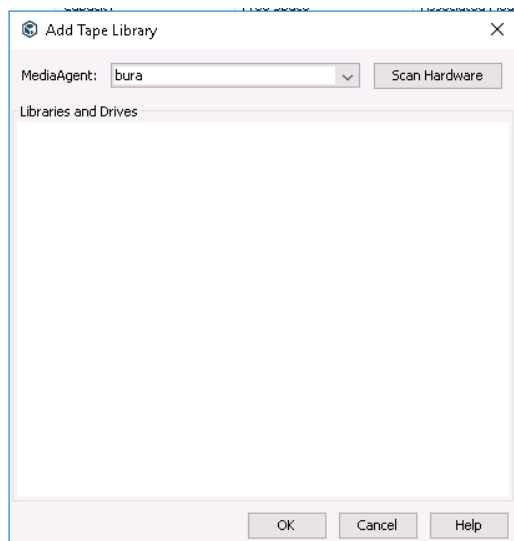


Select Storage Resources and right-click Libraries.

Go to Add > Tape Library.



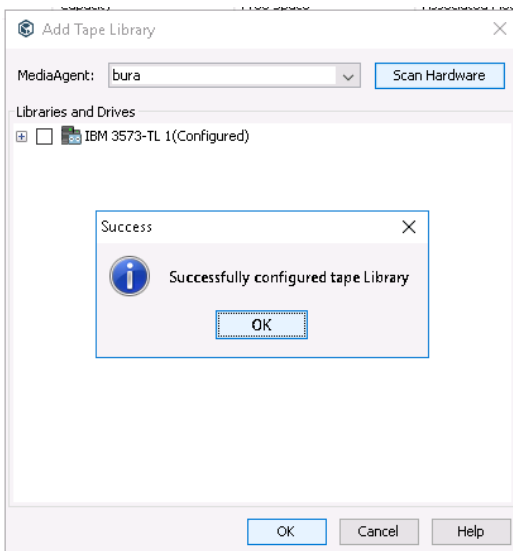
Select the media agent with access to the tape library and click Scan Hardware.



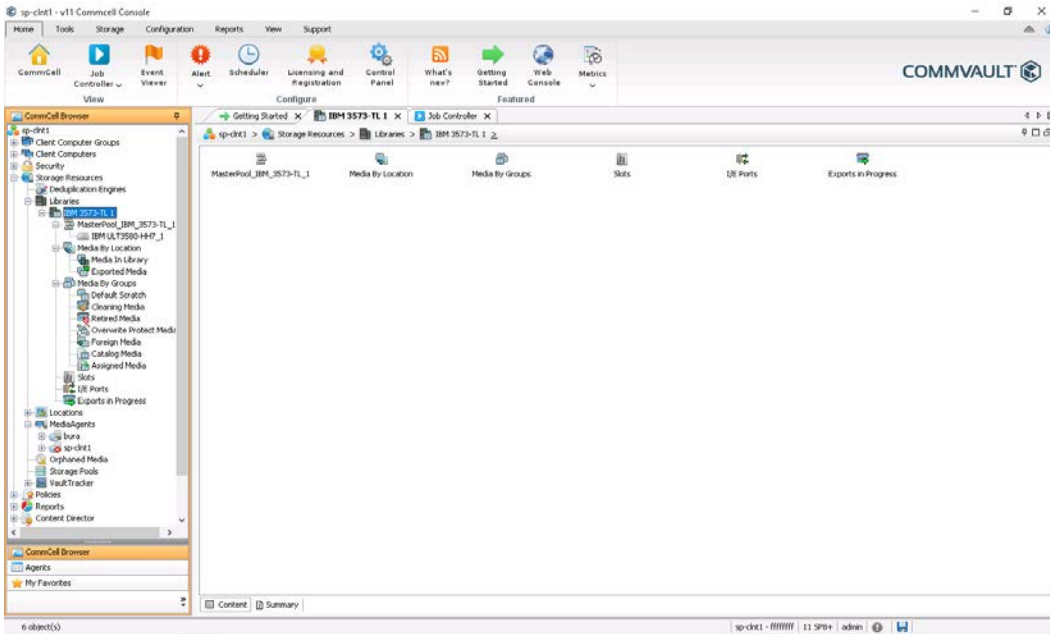
Select the tape library (IBM 3573-TL) and the tape drive and click OK.



Click OK.



The tape library and tape drive are now available, and an inventory process is started in the background.



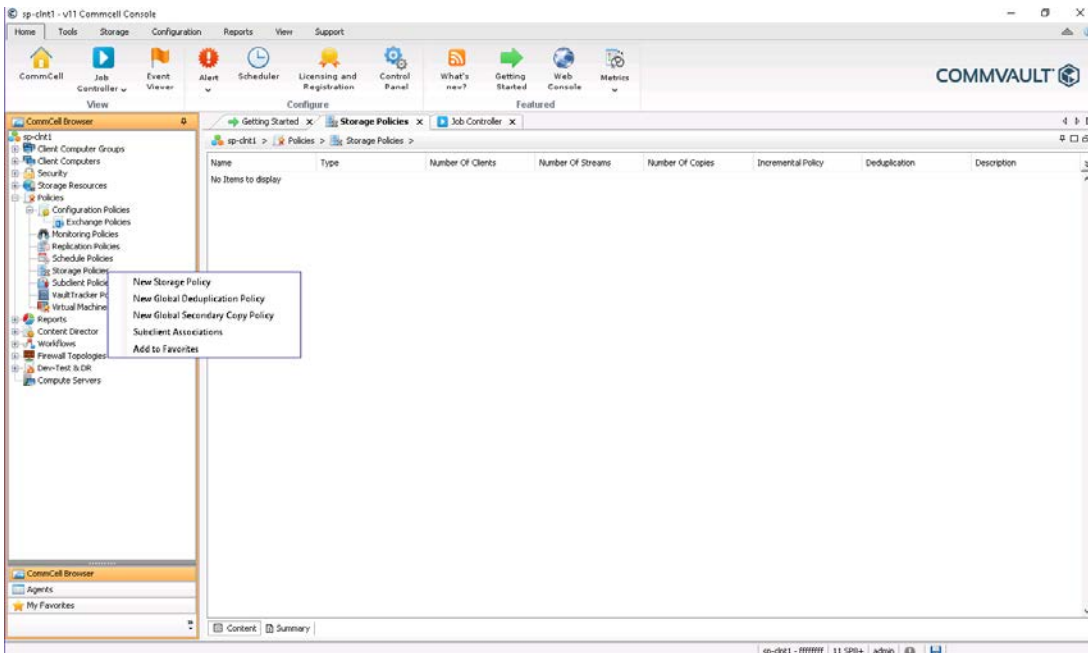
All available tape media in the tape library are added to the Default Scratch media group.



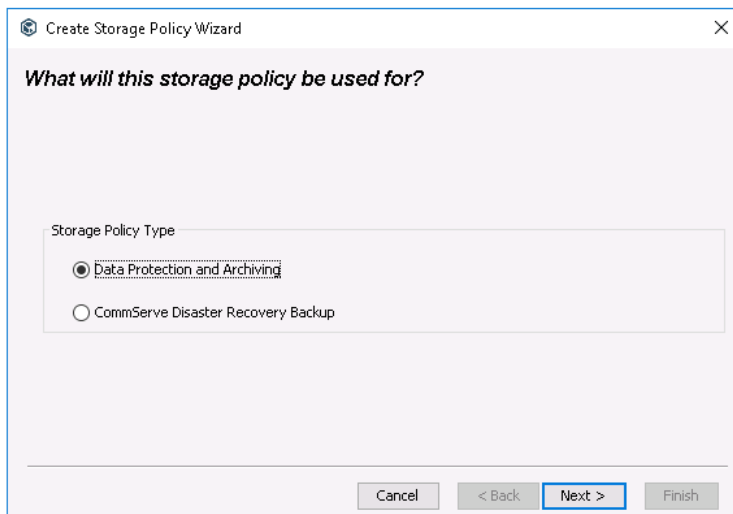
You must now modify an existing storage policy or create a new one.

Open Policies and right-click Storage Policies.

Select New Storage Policy.



Select Data Protection and Archiving and click Next.



Enter an easily identifiable name for the storage policy and click Next.

Create Storage Policy Wizard [Close]

Enter the storage policy name

Storage Policy Name:

Incremental Storage Policy:

Provide the OnCommand Unified Manager Server Information

Buttons: Cancel, < Back, Next >, Finish

Select the discovered policy tape library and click Next.

Create Storage Policy Wizard [Close]

Select the library

Library for Primary Copy:

Buttons: Cancel, < Back, Next >, Finish

Select the media agent and drive pool and click Next.

Create Storage Policy Wizard

Select the default MediaAgent and drive pool

For Primary Copy

MediaAgent: bura

Drive Pool: DrivePool(bura)1

Cancel < Back Next > Finish

Select Default Scratch as the scratch pool and click Next.

Create Storage Policy Wizard

Select the scratch pool

Scratch Pool for Primary Copy: Default Scratch

Cancel < Back Next > Finish

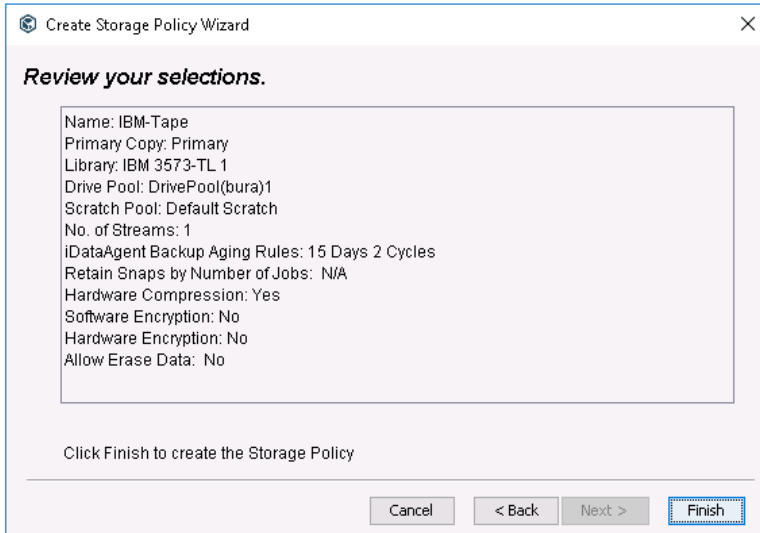
Define the number of device streams and the copy aging rules based on your requirements. Then click Next.

The screenshot shows a dialog box titled "Create Storage Policy Wizard" with a close button (X) in the top right corner. The main heading is "Enter the streams and retention criteria". Below this, there are two sections: "Number of Device Streams:" with a spinner box set to "1", and "Choose the Primary Copy's Aging Rules:" with a sub-heading "iDataAgent Backup data". Under the sub-heading, there is a checkbox for "Infinite/" which is unchecked, followed by a spinner box set to "15" and the text "Days", and another spinner box set to "2" and the text "Cycles". At the bottom of the dialog, there are four buttons: "Cancel", "< Back", "Next >" (which is highlighted with a blue border), and "Finish".

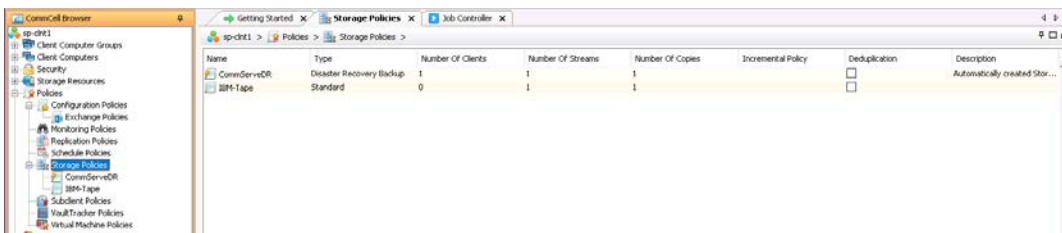
Select the check box for Hardware Compression and specify the encryption settings as required for the local setup. Click Next.

The screenshot shows a dialog box titled "Create Storage Policy Wizard" with a close button (X) in the top right corner. The main heading is "Advanced settings for the primary copy". Below this, there are two main sections: "Hardware Compression" with a checked checkbox, and "Encryption Settings" with an unchecked checkbox. Under "Encryption Settings", there are two radio button options: "Hardware Encryption (Direct Media Access: Via Media Password)" which is unselected, and "Software Encryption (Type: BlowFish, Key Length: 128)" which is selected. At the bottom of the dialog, there are four buttons: "Cancel", "< Back", "Next >" (which is highlighted with a blue border), and "Finish".

Review the settings and click Finish.



The storage policy is now ready for use.



The IBM TS4300 Tape Library is now ready. Follow the Commvault documentation to configure the pools and policies for the new tape library.

Configuring IBM Spectrum Protect

At the time that this document was created, configuration of the new IBM TS4300 Tape Library using IBM Spectrum Protect was not available in the IBM Spectrum Protect Operations Center installed in the landscape used for the setup described here. The configuration of the IBM TS4300 Tape Library described here was performed from the command-line interface (CLI).

Open a command window on the IBM Spectrum Protect server.

Run **tsmdlst** to display a list of available devices on the server:

```
C:\> tsmdlst
```

```
Computer Name:      TSMSLES1
OS Version:         6.3
OS Build #:         9200
TSM Device Driver:  TSMScsi - Not Running
```

...

TSM Name	ID	LUN	Bus	Port	SSN	WWN	TSM Type	Driver

mt4.0.0.7	4	0	0	7	XXXXXXXXXX	500507630XXXXXXXX	LTO	IBM
ULT3580-HH7	D8D4							IBM
lb4.1.0.7	4	1	0	7	00000XXXXXXXXXX	500507630XXXXXXXX	LIBRARY	IBM
03573L32	C460							IBM

Run the following commands to add the tape library and tape drive to the IBM Spectrum Protect server:

```
C:\> define library LB_3584-11_E08 libtype=scsi
```

```
C:\> define path TSMSLES1 LB_3584-11_E08 srctype=server desttype=library device=lb4.1.0.7
```

```
C:\> define drive LB_3584-11_E08 LB_3584-11_F2R06_E08
```

```
C:\> define path TSMSLES1 drive01 srctype=server desttype=drive library= LB_3584-11_E08
device=mt4.0.0.7
```

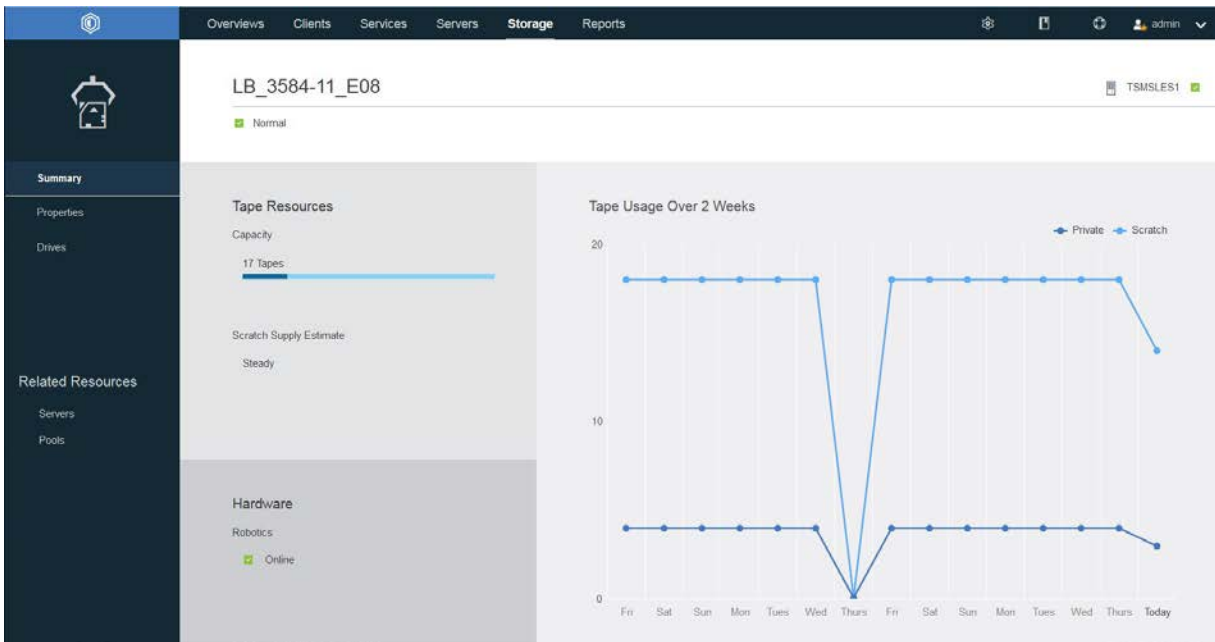
```
C:\> define devclass LB_3584-11_class library= LB_3584-11_E08 devtype=lto
```

```
C:\> define stgpool LB_3584-11_pool LB_3584-11_class maxscratch=20
```

```
C:\> label libvolume LB_3584-11_E08 search=yes labelsource=barcode checkin=scratch
```

```
C:\> audit library
```

The IBM Spectrum Protect Operations Center shows the configured devices and their use. Go to Storage > Tape Storage. The screenshots shown here are for illustration only and may not match your exact configuration.



The screenshot displays the Properties section for device LB_3584-11_E08. The interface includes a navigation menu on the left with options like Summary, Properties, Drives, and Related Resources. The main content area shows a table of properties categorized into General and Library Settings.

General	
Device class name	DC_3584-11_TS1150
Library management	Library manager
Library type	SCSI
Device type	3592
Format	Best available
Library Settings	
Logical block protection	No
Drive encryption	ALLOW
WDRM	NO
Compression	—
Mount wait	60 minutes
Mount retention	1 minutes

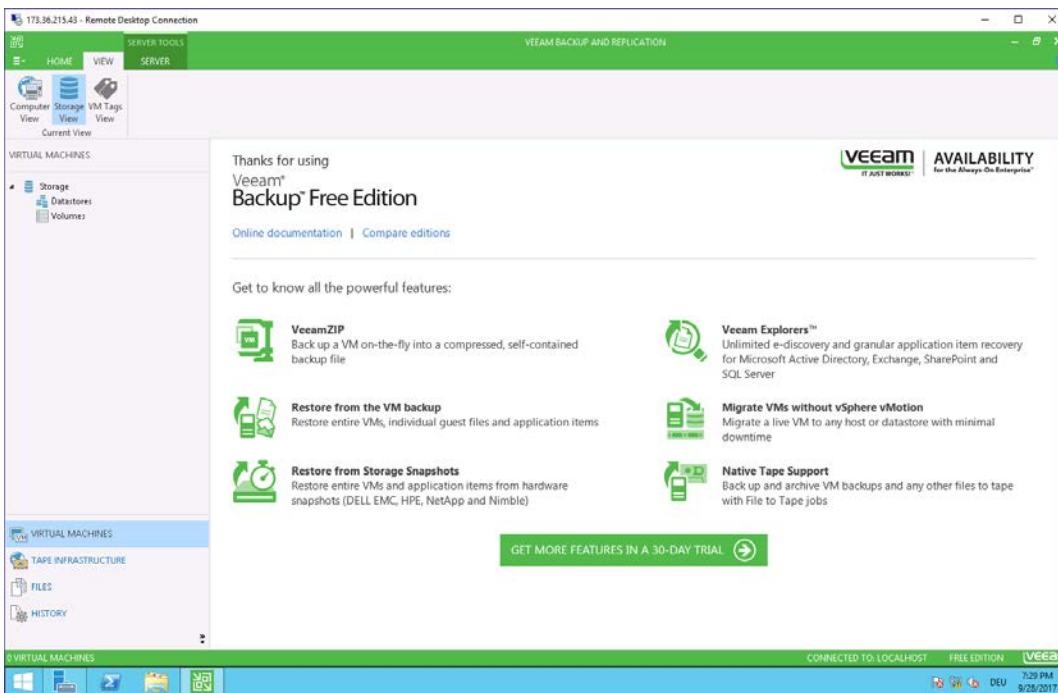
The screenshot shows the IBM Spectrum Protect console interface. The top navigation bar includes 'Overviews', 'Clients', 'Services', 'Servers', 'Storage', and 'Reports'. The main header displays 'LB_3584-11_E08' and 'TSMILES1'. Below this, a table lists storage details:

Name	Status	Paths	Usage	Tape Volume	Assigned To
DR_3584-11_F2R06_E08	Online	1 Available All online	Empty		
DR_3584-11_F2R07_E08	Online	1 Available All online	Empty		
DR_3584-11_F2R08_E08	Online	1 Available All online	Empty		

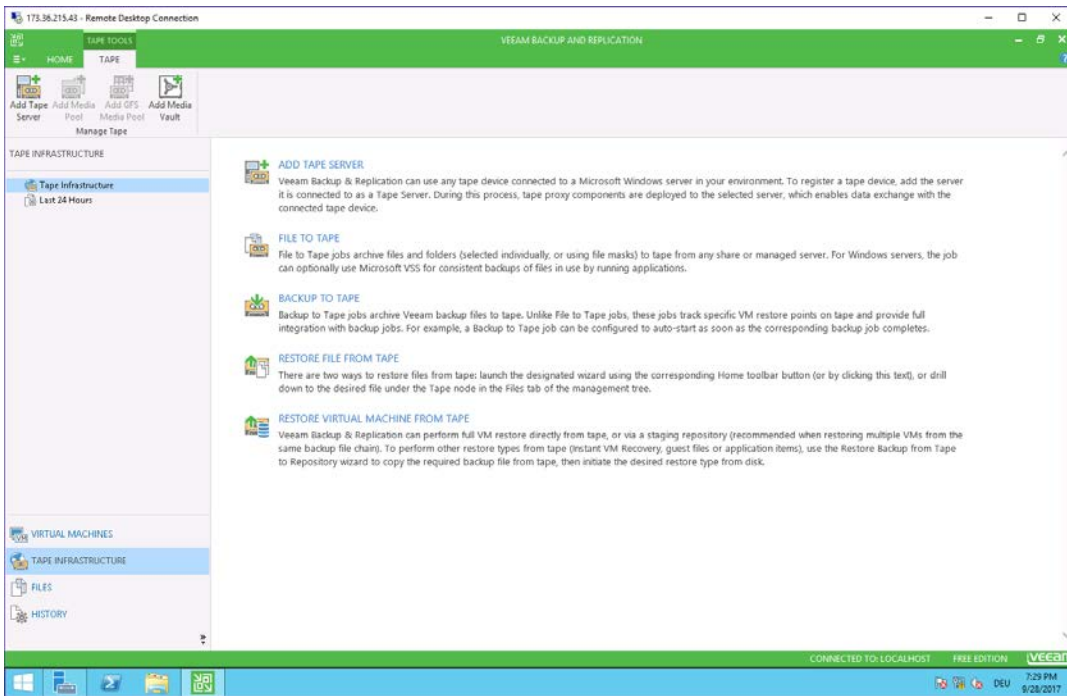
The IBM TS4300 tape library is now ready for use. Follow the IBM Spectrum Protect documentation to configure the pools and policies for the new tape library.

Configuring Veeam

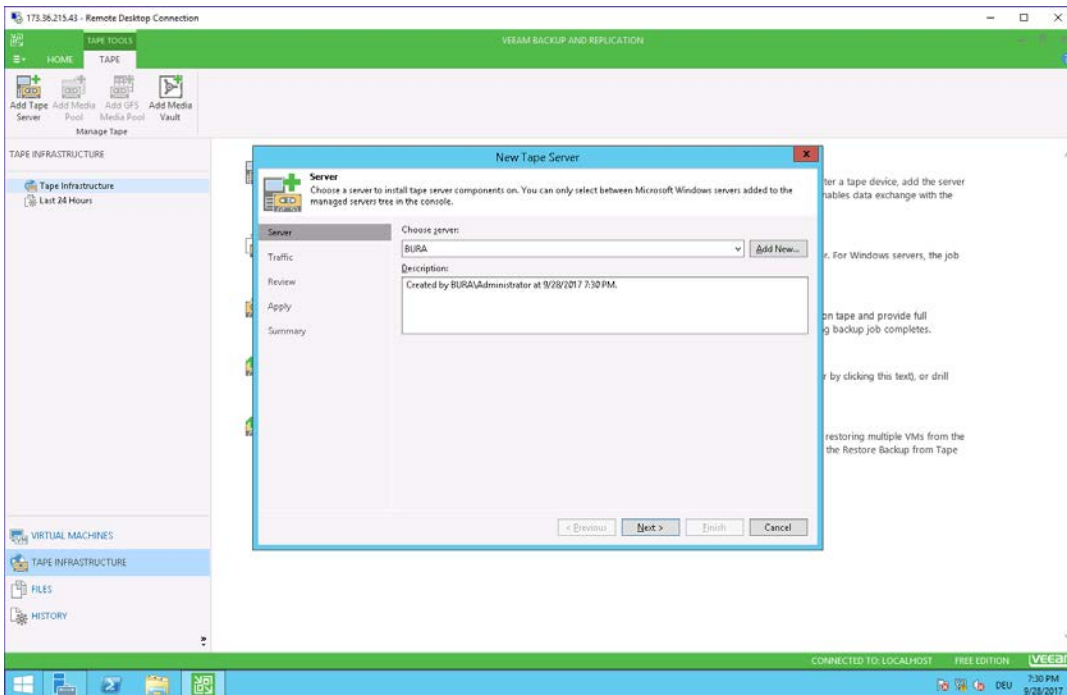
To configure the IBM TS4300 Tape Library using Veeam, open the Veeam Admin Console and go to View > Storage View.



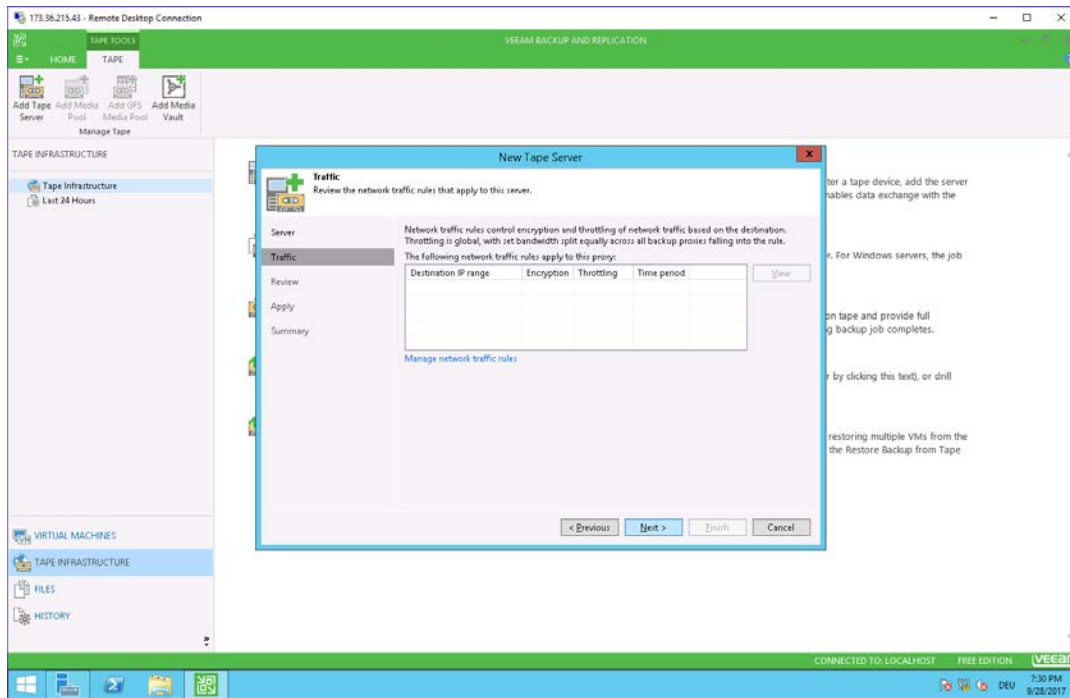
Click Tape Infrastructure and Add Tape Server.



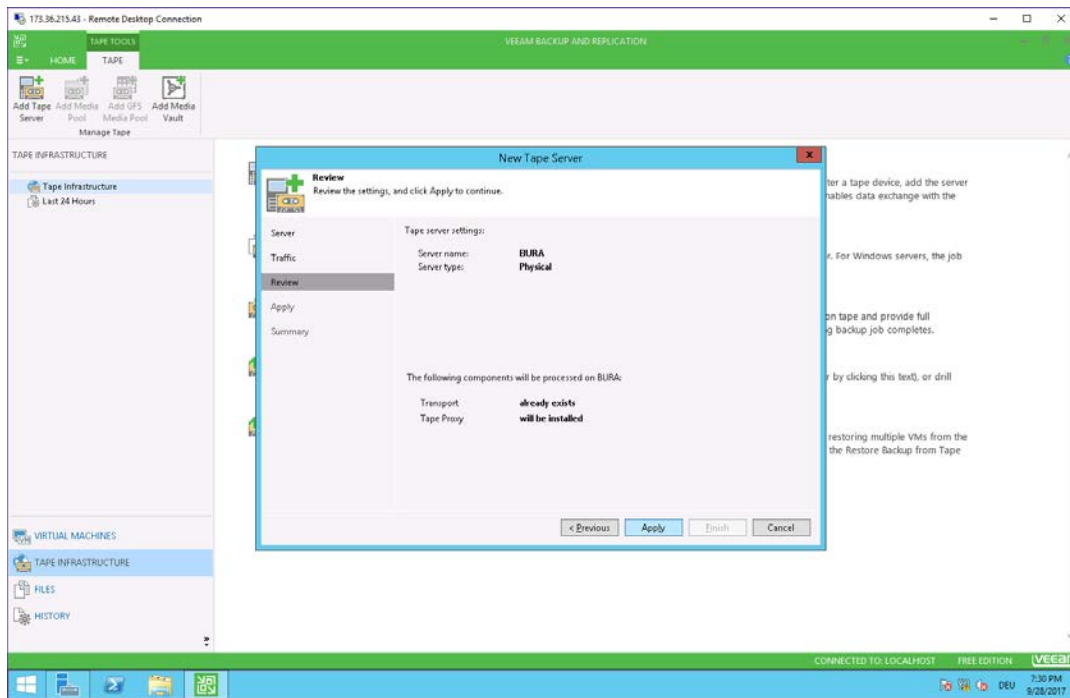
Select the server with access to the tape library and click Next.



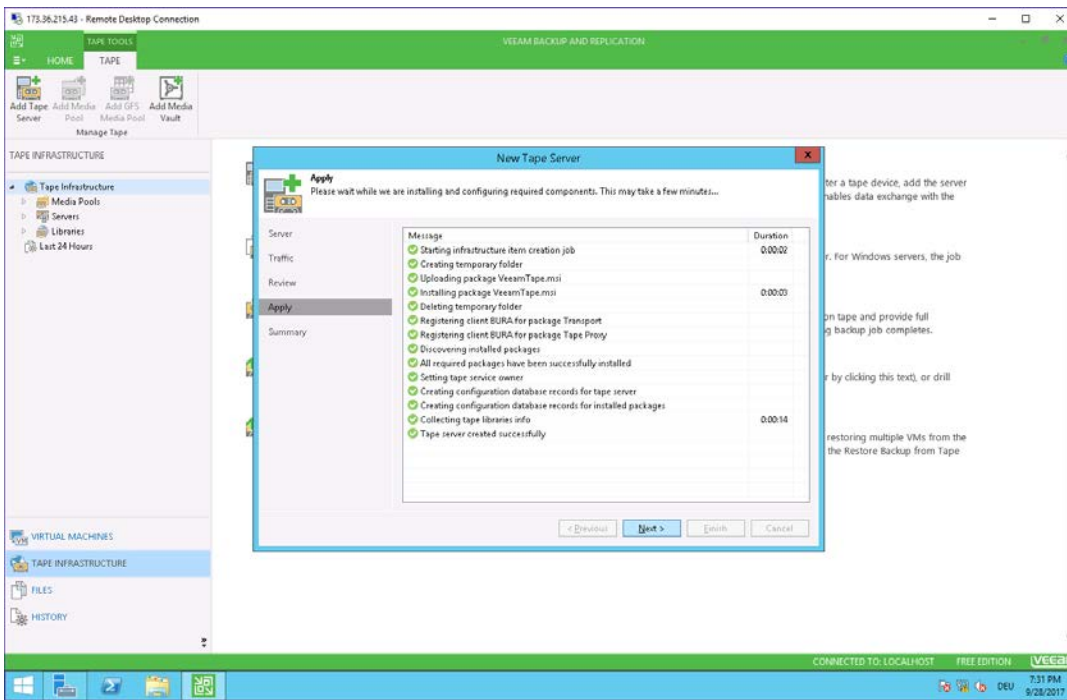
Configure the network traffic settings as required and click Next.



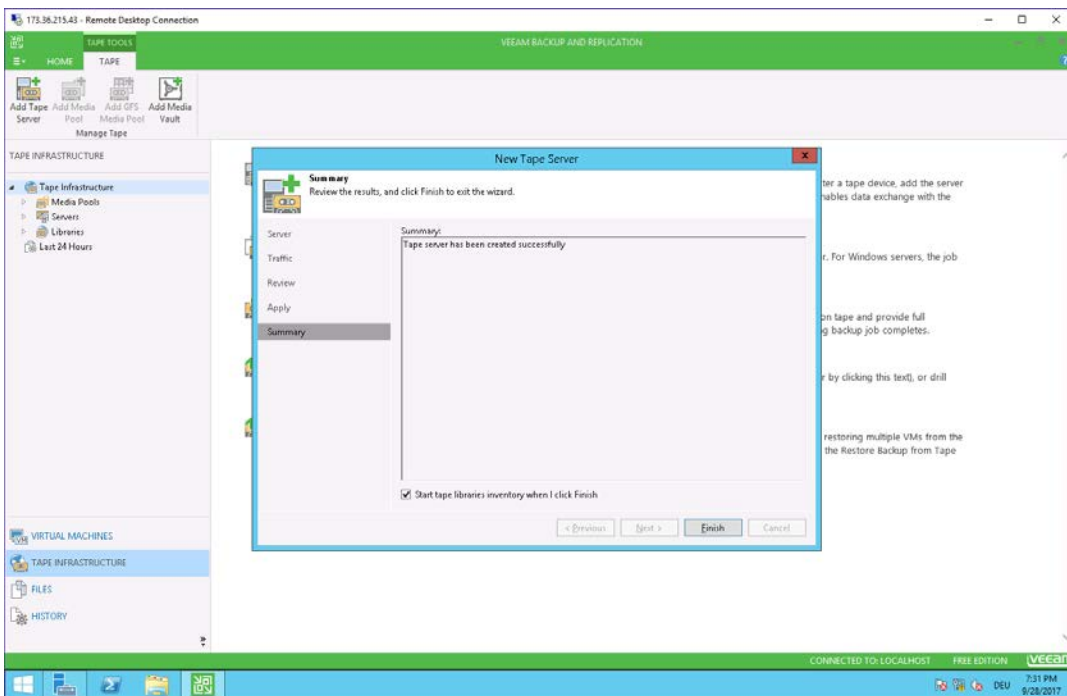
Review the settings and click Apply.



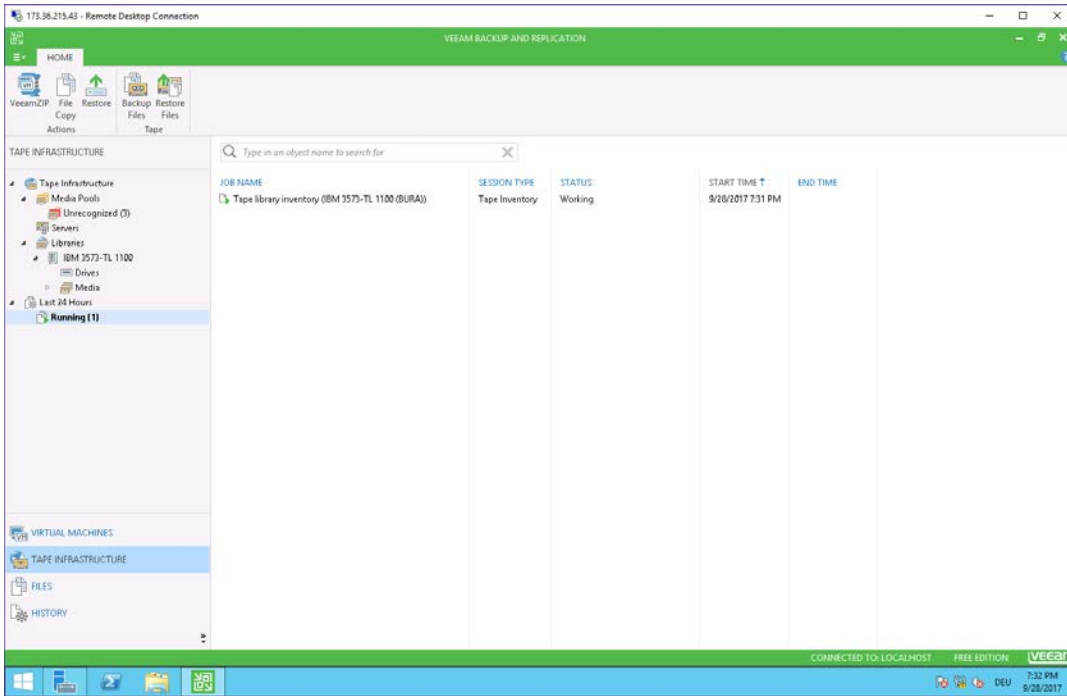
Click Next.



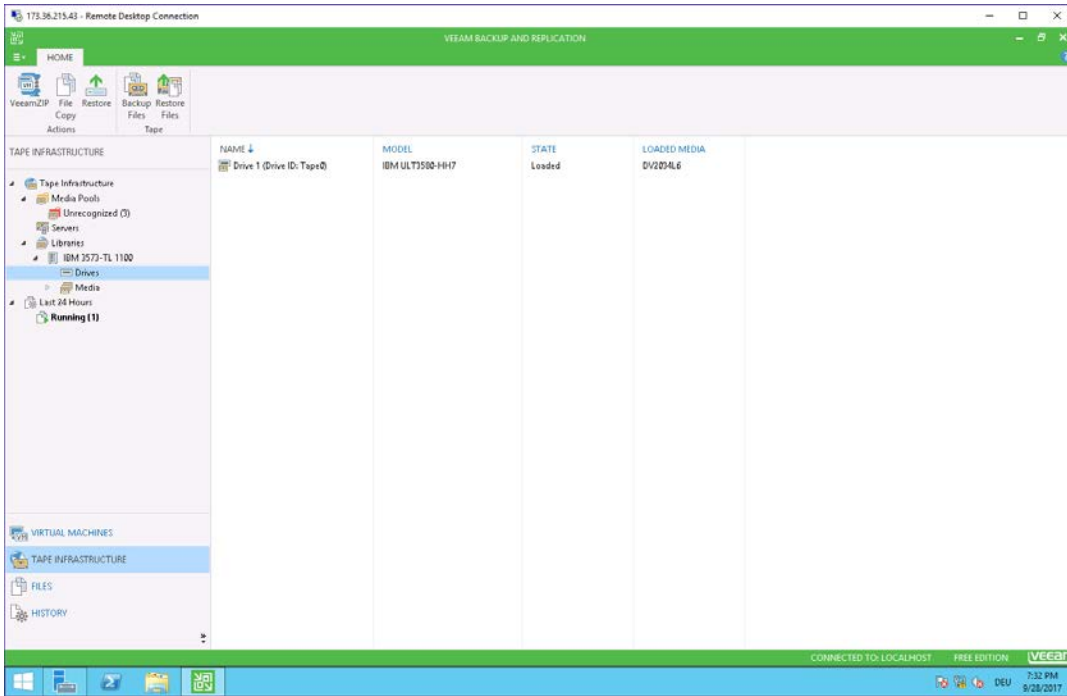
Click Finish.



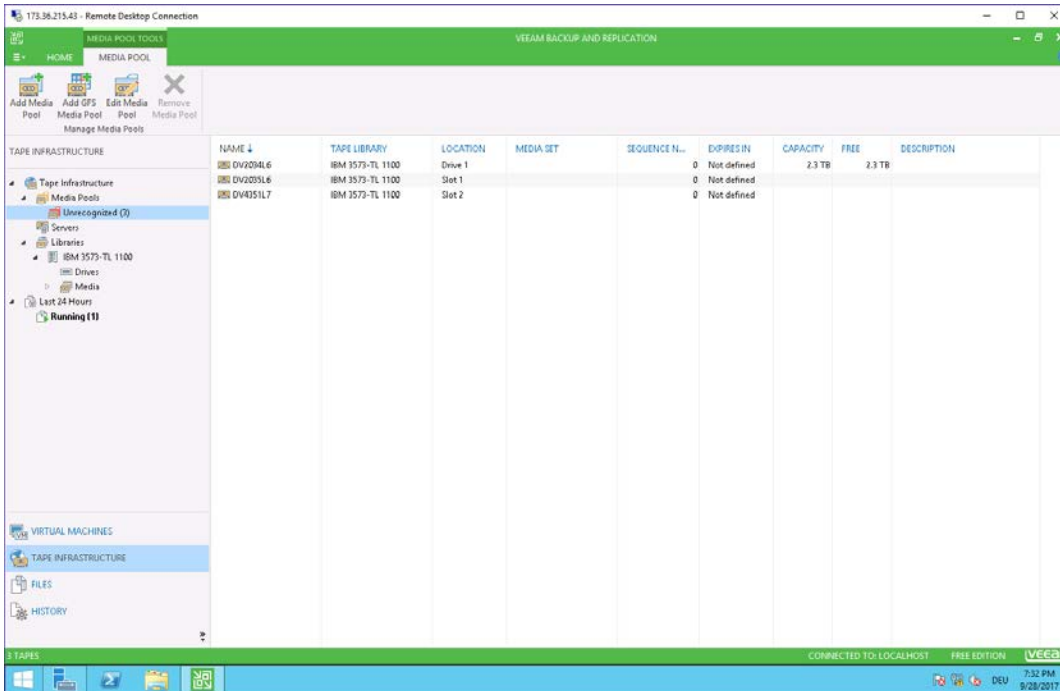
An inventory job is started in the background to discover available tape libraries and tape drives.



The IBM TS4300 Tape Library and the tape drives are added to the Veeam configuration.



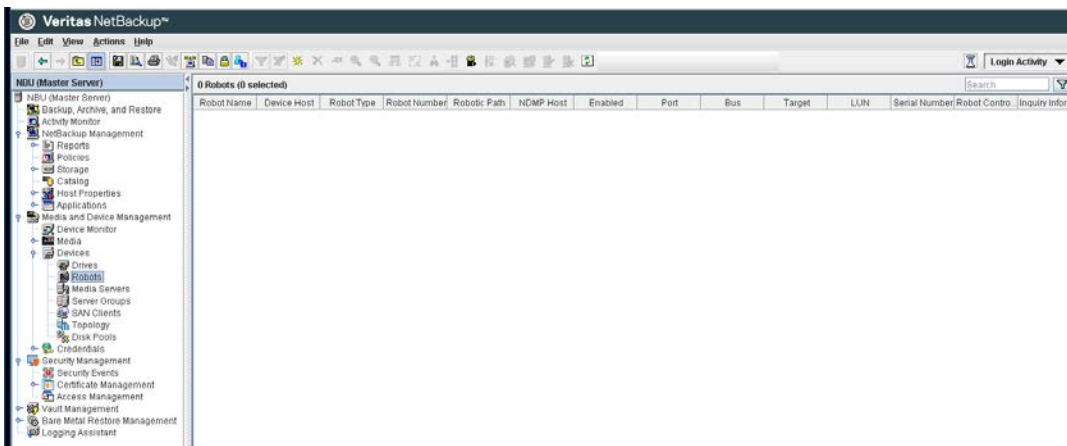
The Veeam software initiates an inventory job to display a list of all available tape media.



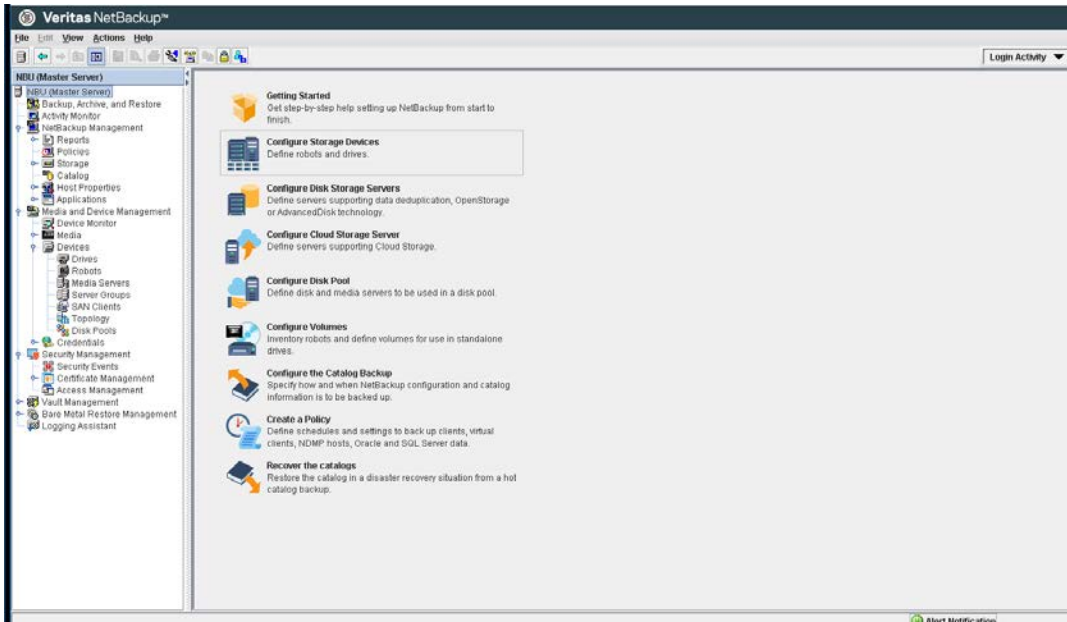
The IBM TS4300 Tape Library is now ready for use. Follow the Veeam documentation to configure the pools and policies for the new tape library.

Configuring Veritas NetBackup

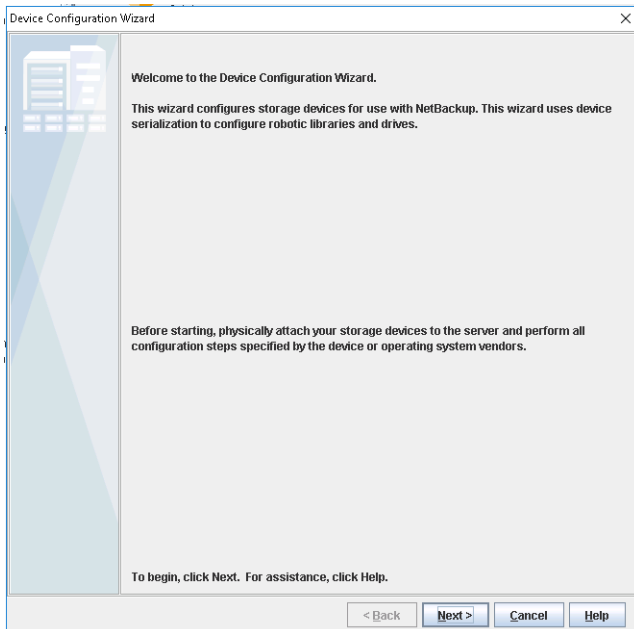
To configure the IBM TS4300 Tape Library with Veritas NetBackup, open the Veritas NetBackup Administrative Console and check the status of configured drives and robots.



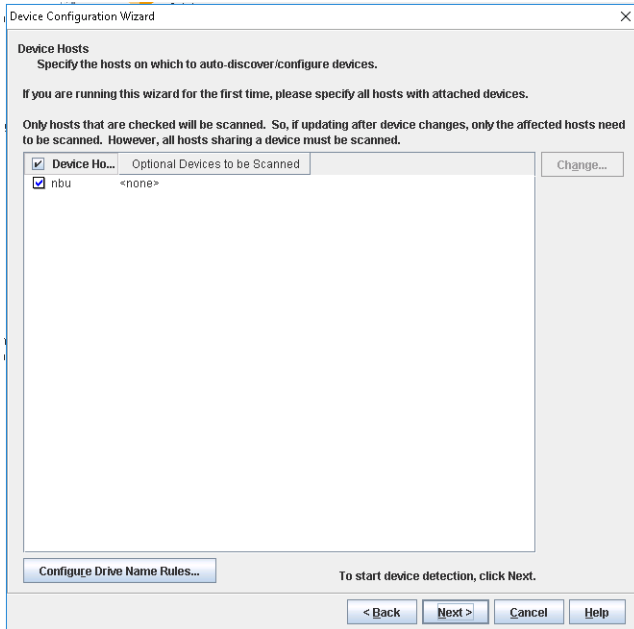
Return to the initial screen and click Configure Storage Devices.



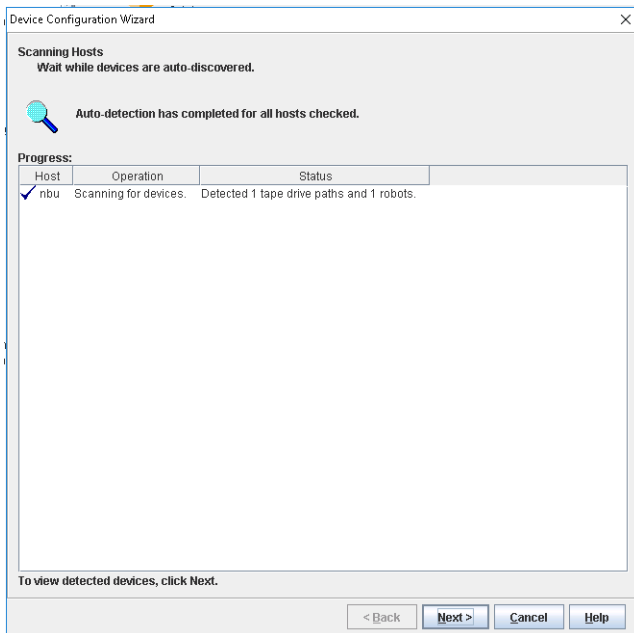
Click Next.



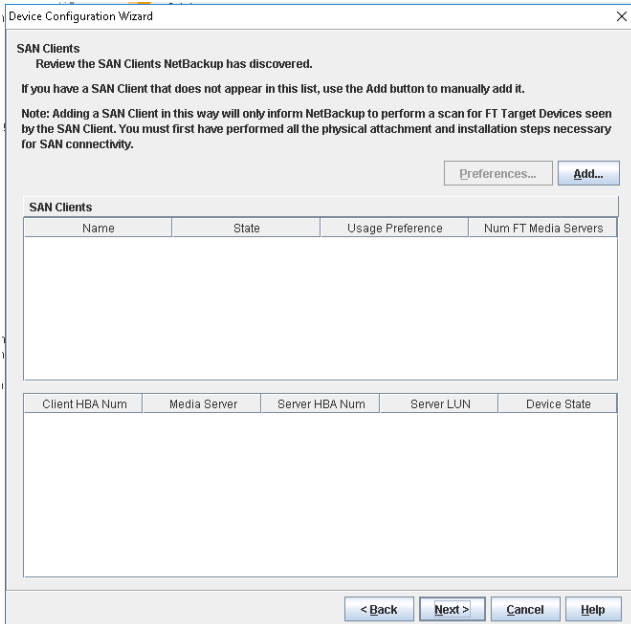
Select the media server with access to the tape library and click Next.



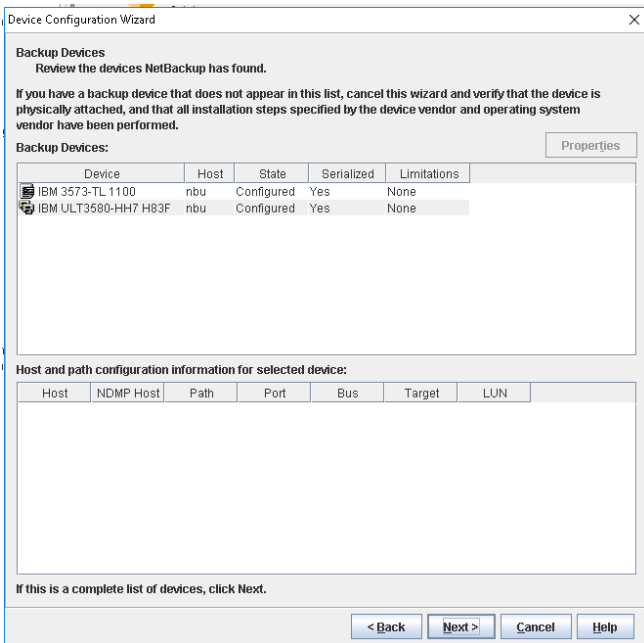
Click Next.



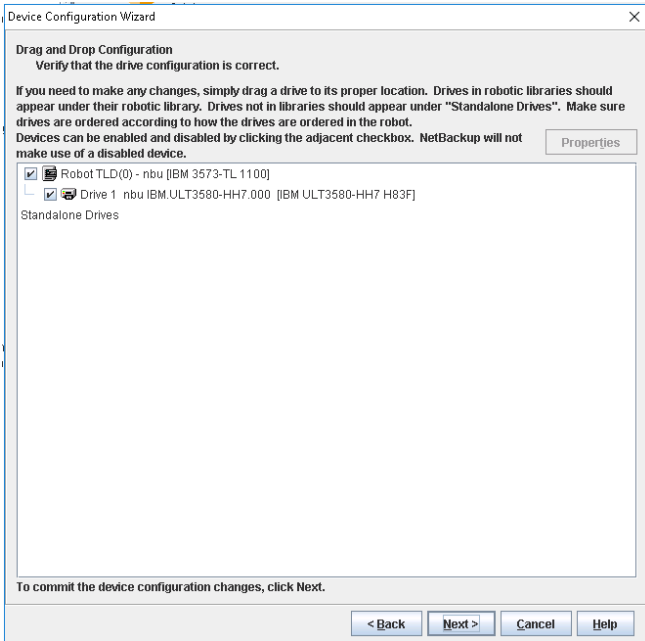
Click Next.



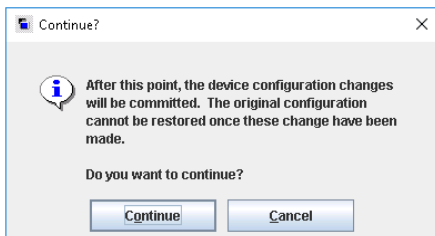
Review the list of discovered devices and click Next.



Select the robot and drive and click Next.

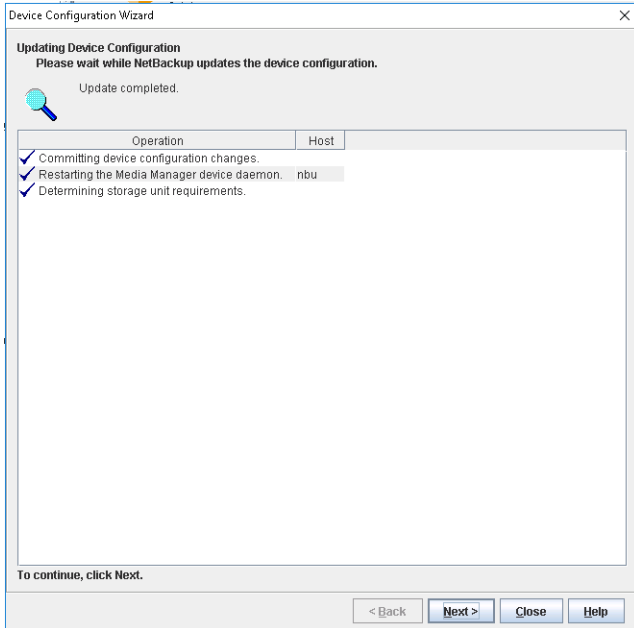


Click Continue.



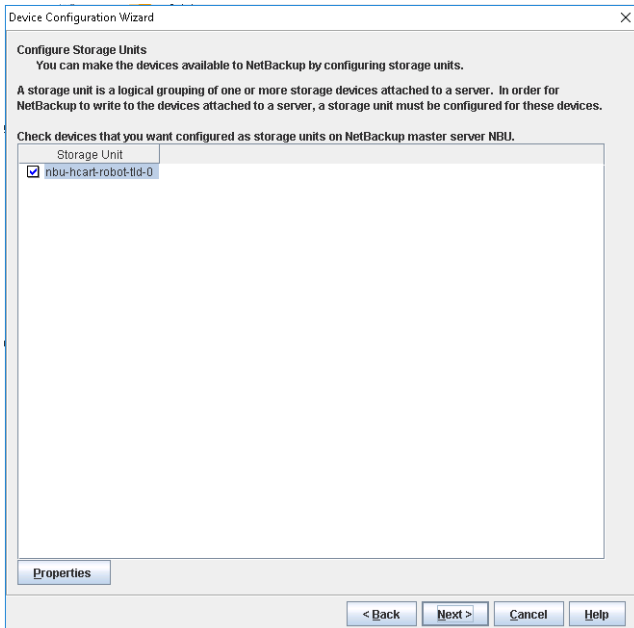
NetBackup now configures the media server to use the tape library.

When the process finishes, click Next.

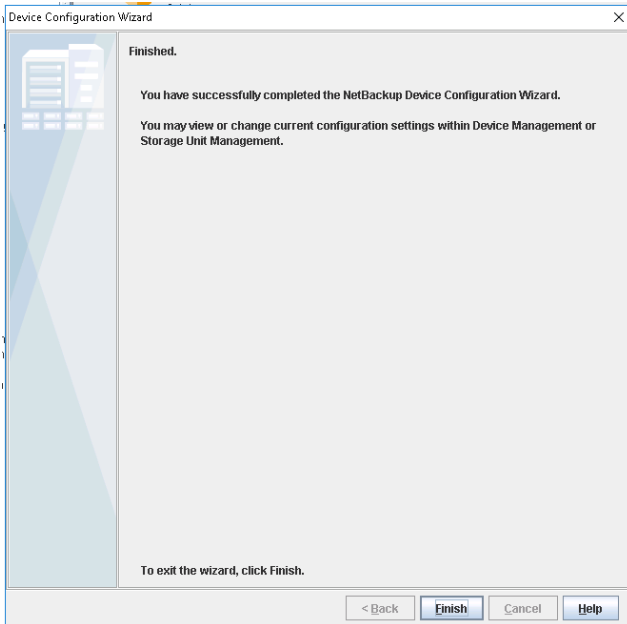


NetBackup now configures the storage unit for this tape library.

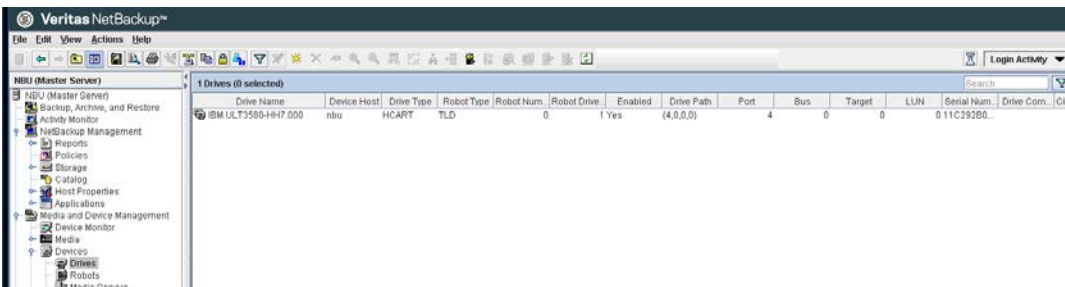
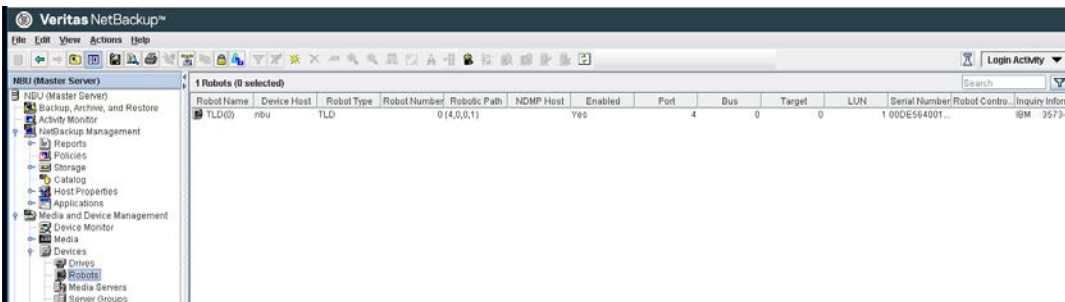
Click Next.



Click Finish.

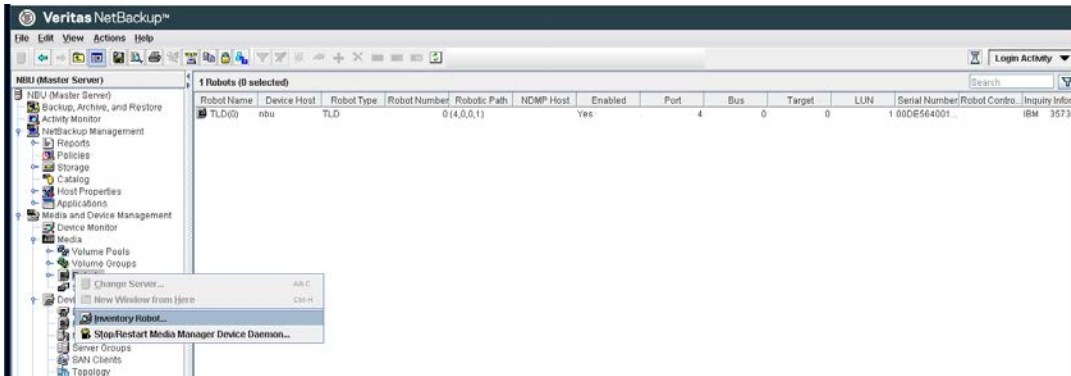


The Medium Changer is now available under Robots, and the tape drive is available under Drives.

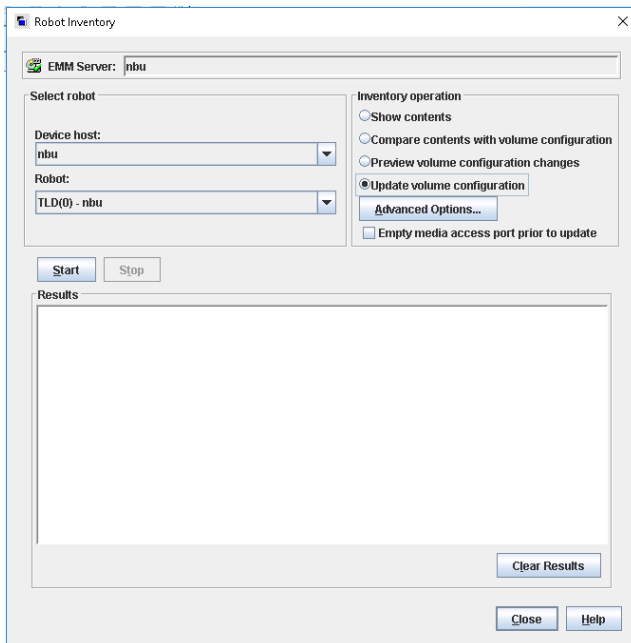


Go to Media and Device Management > Media.

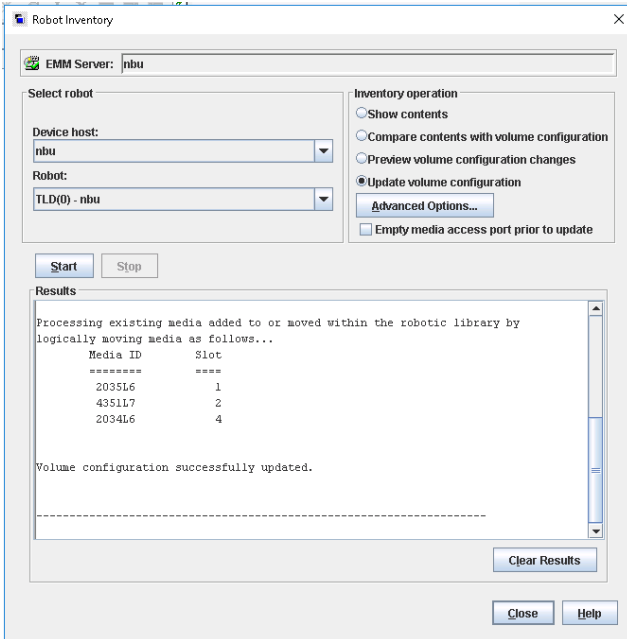
Right-click any entry and select Inventory Robot.



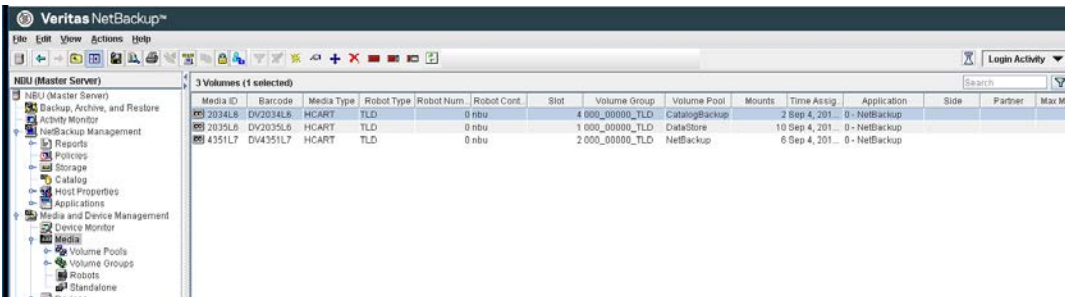
Choose the device host and robot for the inventory on the left side, and select “Update volume configuration” on the right side. Click Start.



After the inventory process finishes, click Close.



The tape media added to the default scratch pool.



Follow the Veritas NetBackup documentation to configure the volume pools, retention levels, and policies for the new tape library.

For more information

For additional information, see the following:

- [Cisco UCS S3260 Storage Server](#)
- [Cisco UCS 6000 Series Fabric Interconnects](#)
- [Cisco UCS Manager](#)
- [Cisco white paper—Achieve Optimal Network Throughput on the Cisco UCS S3260 Storage Server](#)
- [Commvault](#)
- [IBM Spectrum Protect](#)
- [Veeam Availability Platform](#)
- [Veritas NetBackup](#)

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