



Configuring SME Tapes

This chapter contains information about managing tapes that are encrypted using SME.

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Information About SME Tape Management

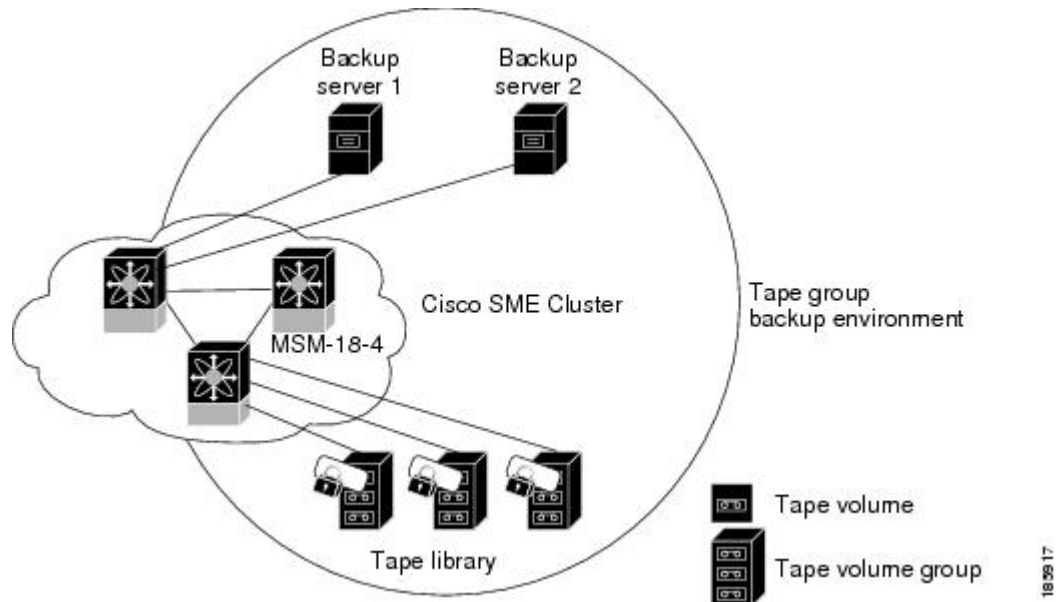
Once provisioned, SME provides transparency to hosts and targets. To manage the paths from a hosts to tape devices, SME uses the following:

- **Tape group** —A backup environment in the SAN. This consists of all the tape backup servers and the tape libraries that they access.
- **Tape device** —A tape drive that is configured for encryption.
- **Tape volume** —A physical tape cartridge identified by a barcode for a given use.
- **Tape volume group** —A logical set of tape volumes configured for a specific purpose. Using SME, a tape volume group can be configured using a barcode range or a specified regular expression. In an auto-volume group, a tape volume group can be the volume pool name configured at the backup application.

SME provides the capability to export a volume group with an encryption password. This file could later be imported to a volume group. Also, volume group filtering options provide mechanisms to specify what type of information will be included in a specific volume group. For example, you could filter information in a volume group by specifying a barcode range.

The following figure shows the SME tape backup environment.

Figure 1: SME Tape Backup Environment and Configuration



The following concepts are used in tape management procedures:

- Key management settings
- Auto-volume group
- Key-on-Tape
- Compression
- Configuring volume groups



Note If data is written to a partially non-SME encrypted tape, it is left in clear text. When a tape is recycled or relabeled, the tape will be encrypted by SME.

Configuring SME Tape Management Using the CLI

This section includes the following topics:

Enabling and Disabling Tape Compression

To enable tape compression, follow these steps:

Step 1 `switch# configure terminal`
Enters configuration mode.

- Step 2** `switch(config)# sme cluster clustername1`
Specifies the cluster and enters SME cluster configuration submode.
- Step 3** `switch(config-sme-cl)# tape-compression`
Enables tape compression.
- Step 4** `switch(config-sme-cl)# no tape-compression`
Disables tape compression.
-

Enabling and Disabling Key-on-Tape

SME provides the option to store the encrypted security keys on the backup tapes.

To enable the key-on-tape feature, follow these steps:

- Step 1** `switch# configure terminal`
Enters configuration mode.
- Step 2** `switch(config)# sme cluster clustername1`
Specifies the cluster and enters SME cluster configuration submode.
- Step 3** `switch(config-sme-cl)# key-ontape`
Enables the key-on-tape feature.
- Step 4** `switch(config-sme-cl)# no key-ontape`
Disables key-on-tape feature.
-

Configuring a Tape Volume Group

A tape volume group is a group of tapes that are categorized usually by function. For example, HR1 could be the designated tape volume group for all Human Resource backup tapes; EM1 could be the designated tape volume group for all e-mail backup tapes.

Adding tape groups allows you to select the VSANs, hosts, storage devices, and paths that SME will use for encrypted data. For example, adding a tape group for HR data sets the mapping for SME to transfer data from the HR hosts to the dedicated HR backup tapes.

To configure a tape volume group, follow these steps:

- Step 1** `switch# configure terminal`
Enters configuration mode.
- Step 2** `switch(config)# sme cluster clustername1`

Specifies the cluster and enters SME cluster configuration submode.

Step 3 switch(config-sme-cl)# **tape-bkgrp** *groupname1*

Specifies the tape volume group and enters the SME tape volume group submode.

Step 4 switch(config-sme-cl-tape-bkgrp)# **tape-device** *devicename1*

Specifies the tape device name and enters the SME tape device submode.

Step 5 switch(config-sme-cl-tape-bkgrp-tapedevice)# **tape-device** *devicename1 D*

Specifies the tape cartridge identifier.

Step 6 switch(config-sme-cl-tape-bkgrp-tapedevice)# **host** *10:00:00:00:c9:4e:19:ed target 2f:ff:00:06:2b:10:c2:e2 vsan 4093 lun 0 fabric f1*

Specifies the host and target, the VSAN, LUN and the fabric (f1) for the tape volume group.

Step 7 switch(config-sme-cl-tape-bkgrp-tapedevice)# **enable**

Enables the tape device.

Enabling and Disabling Automatic Volume Groups

When SME recognizes that a tape barcode does not belong to an exiting volume group, then SME creates a new volume group when automatic volume grouping is enabled.

Automatic volume grouping is disabled by default.

To enable or disable automatic volume grouping, follow these steps:

Step 1 switch# **configure terminal**

Enters configuration mode.

Step 2 switch(config)# **sme cluster** *clustername1*

Specifies the cluster and enters SME cluster configuration submode.

Step 3 switch(config-sme-cl)# **auto-volgrp**

Specifies automatic volume grouping.

Step 4 switch(config-sme-cl)# **no auto-volgrp**

Specifies no automatic volume grouping.

Adding a Tape Device to the Tape Group

A tape device is specified as part of a tape group and is identified using a name as an alias.

To add a tape device to the tape group, follow these steps:

-
- Step 1** switch# **configure terminal**
Enters configuration mode.
- Step 2** switch(config)# **sme cluster** *clustername1*
Specifies the cluster and enters SME cluster configuration submode.
- Step 3** switch(config-sme-cl)# **tape-bkgrp** *groupname1*
Specifies the tape volume group and enters the SME tape volume group submode.
- Step 4** switch(config-sme-cl-tape-bkgrp)# **tape-device** *devicename1*
Specifies the tape device name and enters the SME tape device submode.
- Step 5** switch(config-sme-cl-tape-bkgrp-tapedevice)# **tape-device** *devicename1* **D**
Specifies the tape cartridge identifier.
-

Adding Paths to the Tape Device



Caution All IT-nexuses that host paths between the server and storage must be added to the configuration or else the data integrity is at risk.

A tape device is specified as part of a tape group and is identified using a name as an alias. All the paths to the tape device in the cluster must be specified using the host, target, LUN, VSAN, and fabric.

To add a path to a tape device in the cluster, follow these steps:

-
- Step 1** switch# **configure terminal**
Enters configuration mode.
- Step 2** switch(config)# **sme cluster** *clustername1*
Specifies the cluster and enters SME cluster configuration submode.
- Step 3** switch(config-sme-cl)# **tape-bkgrp** *groupname1*
Specifies the tape volume group and enters the SME tape volume group submode.
- Step 4** switch(config-sme-cl-tape-bkgrp)# **tape-device** *devicename1*
Specifies the tape device name and enters the SME tape device submode.
- Step 5** switch(config-sme-cl-tape-bkgrp-tapedevice)# **tape-device** *devicename1* **D**
Specifies the tape cartridge identifier.
- Step 6** switch(config-sme-cl-tape-bkgrp-tapedevice)# **host** *10:00:00:00:c9:4e:19:ed* **target** *2f:ff:00:06:2b:10:c2:e2* **vsan** *4093*
lun *0* **fabric** *f1*

Specifies the host and target, the VSAN, LUN and the fabric (f1) for the tape volume group.

Step 7 `switch(config-sme-cl-tape-bkgrp-tapedevice)# no host 10:00:00:00:c9:4e:19:ed target 2f:ff:00:06:2b:10:c2:e2 vsan 4093 lun 0`

Removes the specified path from the tape device.

Example



Note If the IT-nexus specified in the path above is not configured in SME, SME will also trigger a discovery of the IT-nexus along with adding the configured path to the specified tape device. In a scripted environment, when adding paths, it is always advisable to give a delay of one minute to allow the IT-nexus discovery to complete.

Bypassing Tape Encryption

You can enable or disable the bypass feature once you create the tape device.



Note By default, bypass encryption is disabled. Writes fails when a clear text tape is loaded.

To enable or disable bypass tape encryption, follow these steps:

Step 1 `switch# configure terminal`

Enters configuration mode.

Step 2 `switch(config)# sme cluster clustername1`

Specifies the cluster and enters SME cluster configuration submode.

Step 3 `switch(config-sme-cl)# tape-bkgrp groupname1`

Specifies the tape volume group and enters the SME tape volume group submode.

Step 4 `switch(config-sme-cl-tape-bkgrp)# tape-device tapename1`

Specifies the tape that has clear text data.

Step 5 `switch(config-sme-cl-tape-bkgrp-tape device)# no by pass`

Specifies the bypass policy for the tape device, which rejects writes when a clear text tape is used.

Step 6 `switch(config-sme-cl-tape-bkgrp-tape device)# by pass`

Specifies the bypass policy for the tape device, which allows data to pass in clear text.

Example

Caution All IT-nexuses that host paths between the server and storage must be added to the configuration or else the data integrity is at risk.

Verifying SME Tape Management Configuration

To display SME Tape management configuration information, perform one of the following tasks:

Command	Purpose
show sme cluster tape	Displays summary or detailed information about tapes.
show sme cluster tape detail	Displays information about tape cartridges.
show sme cluster tape-bkgrp	Displays information about all tape volume groups or about a specific group.

For detailed information about the fields in the output from these commands, refer to the *Cisco MDS 9000 Family NX-OS Command Reference*.

Monitoring SME Tape Management

This section includes the following topics:

Viewing Host Details

You can view detailed information about hosts in a SME cluster. Information for a specific host includes the tape group membership, paths from the host to the target, VSAN, fabric, status, and the tape device.

Viewing Tape Device Details

You can view detailed information about tape devices in a SME cluster. Information for a specific tape device includes the tape group membership, device description, serial number, and the host and target PWWN.

Viewing SME Tape Information Using the CLI

Use the **show sme cluster tape** command to view summary or detailed information about tapes.

```
switch# show sme cluster clusternam1 tape summary
```

```
-----
Host WWN                Description                Crypto-Tape
                        Backup Group                Status
```

```
-----
10:00:00:00:c9:4e:19:ed HP Ultrium 2-SCSI HR1 online
```

Viewing Tape Cartridge Information

Use the **show sme cluster tape detail** to view information about tape cartridges.

```
switch# show sme cluster clusternam1 tape detail
Tape 1 is online
Is a Tape Drive
HP Ultrium 2-SCSI
Serial Number is 2b10c2e22f
Is a member of HR1
Paths
Host 10:00:00:00:c9:4e:19:ed Target 2f:ff:00:06:2b:10:c2:e2 LUN 0x0000
```

Viewing Tape Volume Group Information

Use the **show sme cluster tape-bkgrp** command to view information about all tape volume groups or about a specific group.

```
switch# show sme cluster clusternam1 tape-bkgrp
-----
Name          Tape Devices      Volume Groups
-----
HR1           1                  1
switch# show sme cluster clusternam1 tape-bkgrp HR1
Tape Backupgroup HR1
Compression is Disabled
Number of tape devices is 1
Number of volume groups is 1
Tape device tdl is online
Is a tape drive
Description is HP Ultrium 2-SCSI
Serial number is 2b10c2e22f
Paths
Host 10:00:00:00:c9:4e:19:ed Target 2f:ff:00:06:2b:10:c2:e2 Lun 0x0000 vsan 4093[f1]
```

Viewing the Status of the Tape Device

Use the **show sme internal info cluster <cname> tape-all** command to view tape information.

```
switch# show sme internal info cluster tie1 tape-all
Tape Backup Groups : 1
Last Seq Id : 1

Tape Backup Group : tb2
Memory Address : 0x10788854
Seq Id : 1
Compression : Enabled
Key on Tape : Disabled
Tape Key Recycle : Enabled
Shared Key Mode : Disabled
Auto Volume Group : Disabled
Tape Devices : 1
Last Device Seq Id : 4
Tape Volgrps : 1
Last Volgrp Seq Id : 1

Tape Devices : 1
```



```

Last Seq Id : 4

Tape Device : td0
Memory Address : 0x107ba054
Seq ID : 4
SME (Encryption) : Enabled
Compression : Enabled
Bypass-Policy : BYPASS DISABLED
Cached Lun Path : (nil)
FSM State : SME_CTAPE_DEVICE_G_ST_STABLE
ITL Count : 1
Tape Drive : 0x107d123c
LUN FSM State : SME_LUN_ST_STABLE

Lun Path :0x107d185c
IT :V 3 I 40:00:00:00:00:00:00:01 T 40:00:00:00:00:00:00:02
LUN :0x0000
Is Configured
Status :2
Error :0x0
Flags :0x1
    
```

Use the `sh sme internal info cluster tie1 tape-bkgrp tb2 tape-device td0` to view the information about a particular Tape Device in a particular Tape Backup Group.

```

switch# sh sme internal info cluster tie1 tape-bkgrp tb2 tape-device td0
Tape Device : td0
Memory Address : 0x107ba054
Seq ID : 4
SME (Encryption) : Enabled
Compression : Enabled
Bypass-Policy : BYPASS DISABLED
Cached Lun Path : (nil)
FSM State : SME_CTAPE_DEVICE_G_ST_STABLE
ITL Count : 1
Tape Drive : 0x107d123c
LUN FSM State : SME_LUN_ST_STABLE

Lun Path :0x107d185c
IT :V 3 I 40:00:00:00:00:00:00:01 T 40:00:00:00:00:00:00:02
LUN :0x0000
Is Configured
Status :2
Error :0x0
Flags :0x1
    
```

Use the `Show Interface smex/y` to view statistical information about the SME interface configured for Encryption.

```

Switch# sh int sme1/1
sme1/1 is up
  In fabric Fabric_sw119
  Member of cluster tie1
    SME
    -----
    Host Reads          0          0          0      0.00 B/s
    Host Writes         0          0          0      0.00 B/s
    Host Total           0          0          0      0.00 B/s
    Tgt Reads           0          0          0      0.00 B/s
    Tgt Writes           0          0          0      0.00 B/s
    Tgt Total            0          0          0      0.00 B/s
    
```

```

Clear          IOs          IO/s          Bytes          Rate
-----
Host Reads      0            0            0            0.00 B/s
Host Writes     0            0            0            0.00 B/s
Host Total      0            0            0            0.00 B/s
Tgt Reads       0            0            0            0.00 B/s
Tgt Writes      0            0            0            0.00 B/s
Tgt Total       0            0            0            0.00 B/s
Compression Ratio      0 : 0
SME to Clear          0.00 %
Read to Write         0.00 %
Clear Luns 1, Encrypted Luns 0
Error Statistics
  0 CTH, 0 Authentication 0 Compression
  0 Key Generation, 0 Incorrect Read Size
  0 Overlap Commands, 0 Stale Key Accesses
  0 Overload Condition, 0 Incompressible
  0 XIPC Task Lookup, 0 Invalid CDB
  0 Ili, 0 Eom, 0 Filemark, 0 Other
  2 FAILED WRITE Count - BYPASS DISABLED by USER =====> If write fails for clear text
tape
      last error at Tue Jun 26 13:39:49 2012

```

Use the module Commands to view LUN specific information.

```

show sme internal info crypto-node 1 lun all
module-1# sh sme internal info crypto-node 1 lun all
TAPE LUN TREE
LUN
---
cpp_lun_ndx          0x5
serial no.           0003-0000-00000000:0000000000000000
type                 sequential
sme_enabled          1
crypto_status        0
vendor_id            SONY
product_id           SDZ-130
asl_id
prod_rev_level       0201
vendor_specific
cluster_name         tie1
enable_pad           False
pad to               0x0
bkgrp_name           tb2
device_name          td0
flags                0
granularity          2
max_block_len_lim    1000
min_block_len_lim    4
block_length         512
compression          1
key_ontape           0
Bypass_Policy        BYPASS DISABLED
has tape             yes
position             200
has cth              no
bypass enc           no
wrap guid            0000000000000000-0000000000000000
media guid           0000000000000000-0000000000000000
total itl count      1
active itl count     1
cmd_send_err         0
Not locked

```

Feature History for SME Tape Management

The below table lists the release history for this feature.

Table 1: Feature History for SME Tape Configuration

Feature Name	Releases	Feature Information
Added a new SME tape command	5.2(6)	Added a new SME tape command.
Software change	5.2(1)	In Release 5.2(1), Fabric Manager is changed to DCNM for SAN (DCNM-SAN).
	4.1(1c)	In Release 4.1(1b) and later, the MDS SAN-OS software is changed to MDS NX-OS software. The earlier releases are unchanged and all references are retained.

