



Collecting storage and host inventory information

ONTAP 7-Mode Transition

NetApp
May 31, 2021

This PDF was generated from https://docs.netapp.com/us-en/ontap-7mode-transition/inventory-collect/concept_ontap_target_releases_supported_by_7mtt.html on May 31, 2021. Always check docs.netapp.com for the latest.

Table of Contents

- Collecting storage and host inventory information 1
 - ONTAP target releases supported by the 7-Mode Transition Tool 1
 - System requirements for running the Inventory Collect Tool 2
 - Storage, host, and FC switches version requirements for inventory collection 3
 - Preparing the 7-Mode systems and hosts for inventory collection 3
 - Supported configurations for generating an FC zone plan 4
 - Syntax and options 5
- Collecting inventory and generating inventory report 7
- Generating the FC zone plan 9
- Collection and assessment commands 10
- Where to find information about transition assessment 16

Collecting storage and host inventory information

Inventory Collect Tool enables you to collect information about clustered Data ONTAP and 7-Mode systems, switches, hosts, and the applications running on these hosts and to create an inventory report. You can then import the inventory report to the 7-Mode Transition Tool for transition assessment.

The tool generates an inventory report workbook and an inventory report XML file that contain configuration details of the storage and host systems.

The Inventory Collect Tool uses TLS or SSL protocols for communicating with the 7-Mode storage systems and SSH or WMI for communicating with hosts. The tool communicates with the storage system using the TLS protocol if TLS is enabled on the storage system. If TLS is disabled and SSLv3 is enabled on a storage system, the tool uses SSLv3 to communicate with the storage system.



The best practice is to enable TLS and disable SSLv3 on the storage system in order to avoid SSLv3 security vulnerabilities (CVE-2014-3566).

If you cannot install the 7-Mode Transition Tool in your environment due to security reasons, then you can import the inventory report XML file generated by the Inventory Collect Tool to 7-Mode Transition Tool (installed outside your data center) for generating an assessment report. You can use the assessment report for assessing the features and functionalities of your systems and identify how these features and functionalities work in the clustered Data ONTAP version selected for transition.

Inventory Collect Tool is a stand-alone utility that does not require any installation.

Be sure to consult the current 7-Mode Transition Tool [Release Notes](#) for the latest information about supported target releases and known issues.

ONTAP target releases supported by the 7-Mode Transition Tool

Release support for ONTAP transition target clusters depends on the transition method you want to use, copy-based or copy-free, and on the version of the 7-Mode Transition Tool.

Be sure to consult the current 7-Mode Transition Tool [Release Notes](#) for the latest information about supported target releases and known issues.

Copy-based transitions are supported to these ONTAP target releases.

If your transition target is running ...	You must use this 7-Mode Transition Tool version ...
ONTAP 9.8 or earlier supported release	3.3.3

If your transition target is running ...	You must use this 7-Mode Transition Tool version ...
ONTAP 9.7P2 or later 9.7 P release  Earlier 9.7 releases are not supported.	3.3.2
ONTAP 9.6P7 or later 9.6 P release  Earlier 9.6 releases are not supported.	3.3.2
ONTAP 9.5 or earlier ONTAP 9 release	3.3.2 or 3.3.1
Clustered Data ONTAP 8.1.4P4 and later 8.x releases.	3.3.2 or 3.3.1

Copy-free transitions are supported to these ONTAP target releases using 7-Mode Transition Tool 3.3.1.

- ONTAP 9.4 and earlier ONTAP 9 releases.
- Clustered Data ONTAP 8.3.2 and later 8.x releases.



You cannot use the 7-Mode Transition Tool to transition to ONTAP 9.5 or later using the copy-free method. To do so, you must first transition to ONTAP 9.4 using 7-Mode Transition Tool 3.3.1 and then upgrade your cluster to ONTAP 9.5 or later. 7-Mode Transition Tool 3.3.2 does not support copy-free transitions.

System requirements for running the Inventory Collect Tool

You can download and run the Inventory Collect Tool on a Windows system. The Windows system must have the required configuration to run the Inventory Collect Tool.

- The Windows system must be one of the following:
 - 64-bit Windows 7 Enterprise
 - Windows Server 2008 R2 Enterprise with SP1 or later
 - Windows Server 2012 R2 Standard



You can use a Windows virtual machine that meets the required software and hardware requirements to install the Inventory Collect Tool.

- Dual-core x64 processor (1.0 GHz or more)
- 4-GB RAM
- 40-GB HDD

Storage, host, and FC switches version requirements for inventory collection

You must be aware of the versions of Data ONTAP operating in 7-Mode, hosts, and FC switches from which you can collect inventory information.

For the list of 7-Mode versions, hosts, and FC switches that are supported for assessment by the Inventory Collect Tool, see the Interoperability Matrix.

[NetApp Interoperability Matrix Tool](#)

Preparing the 7-Mode systems and hosts for inventory collection

You must ensure that the 7-Mode systems and hosts meet certain network and protocol requirements for successfully generating an inventory report.

Steps

1. Enable HTTPS on the 7-Mode system:

```
options httpd.admin.ssl.enable on
```

2. Enable TLS on the 7-Mode system:

```
options tls.enable on
```



The best practice is to enable TLS because of the security vulnerabilities in SSLv3.

3. Enable SSL and disable SSLv2 and SSLv3 on the 7-Mode system:

- a. Set up and start SSL:

```
secureadmin setup ssl
```

- b. Enable SSL:

```
options ssl.enable on
```

- c. Disable SSLv2 and SSLv3:

```
options ssl.v2.enable off
```

```
options ssl.v3.enable off
```



The best practice is to disable SSLv2 and SSLv3 to avoid security vulnerabilities.

4. Enable SSH on the 7-Mode system:

- a. Set up SSH on the 7-Mode system:

```
secureadmin setup -f ssh
```

The -f option forces the setup to run even if the SSH server is already configured.

b. Enable SSH:

```
secureadmin enable ssh2
```

c. Enable password authentication on the SSH server:

```
options ssh.passwd_auth.enable
```

d. Enable SSH access to the host:

```
options ssh.access
```

5. Prepare your Windows host systems:

- Enable WMI access.

For more information about enabling WMI access, see the host documentation.

- If you have Windows Server 2003, verify that you have installed the Microsoft Fibre Channel Information Tool (fcinfo) package and run the tool once on your Windows host system.

This tool enables you to collect the HBA configuration information of the host.

6. Enable SSH on the Linux or ESXi host.

For more information about enabling SSH, see the host documentation.

7. Verify that you have installed the latest NetApp Host Utilities software for each host.

For information about downloading and installing the NetApp Host Utilities software, see the NetApp Support Site.

8. Verify that all the hosts and storage systems can be reached by the Windows system from which the Inventory Collect Tool is run.

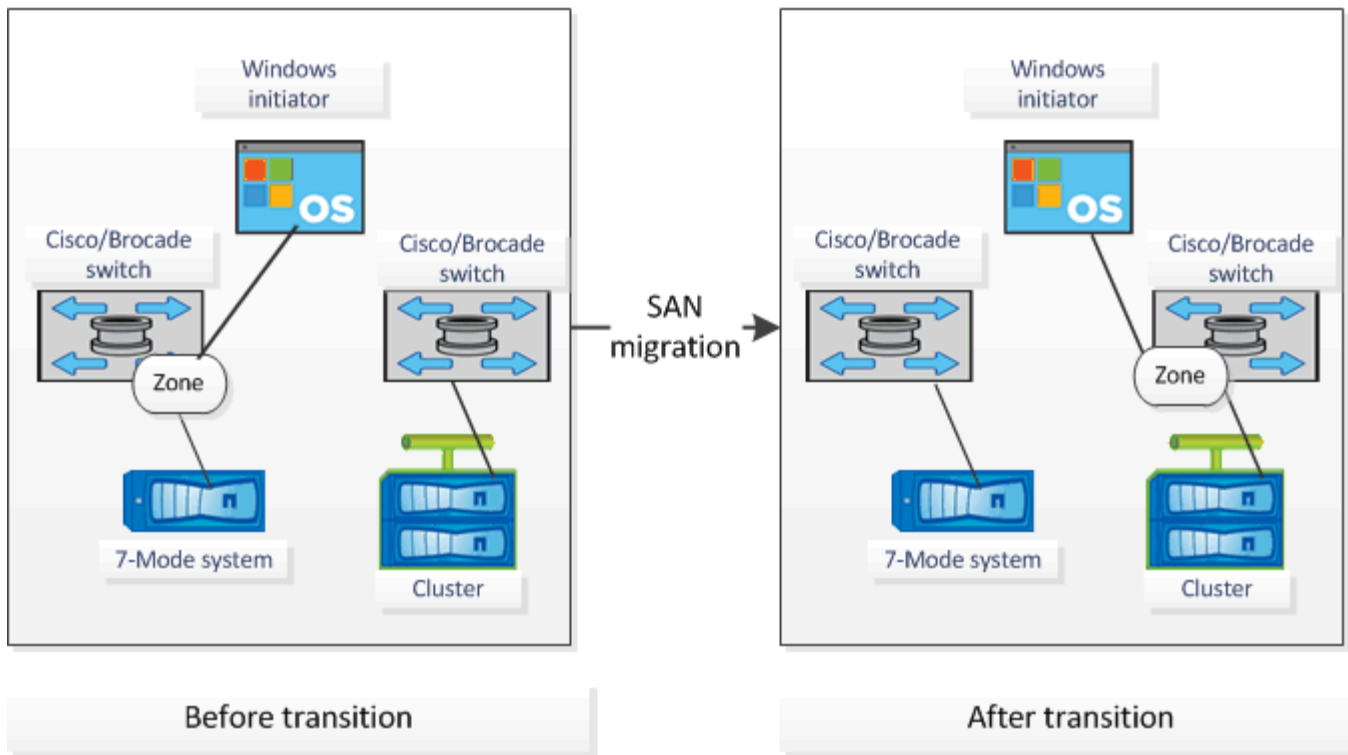
Supported configurations for generating an FC zone plan

You must be aware of the supported configurations of 7-Mode systems, hosts, FC switches, and the cluster to generate the FC zone plan. You should use the plan to configure zones for the cluster after migration.

The 7-Mode systems (single controller or an HA pair), hosts, and cluster can be connected either to the switches in the same fabric or different fabrics, depending on the data center requirements.

The following figure illustrates a configuration in which the 7-Mode systems, hosts, and cluster are connected to the switches in the same fabric:

The following figure illustrates a configuration in which the 7-Mode systems and cluster are connected to switches in different fabrics:



Syntax and options

Inventory Collection Tool (ICT) commands collect configuration and inventory information from controllers and hosts that are specified either in the command-line interface (CLI) or in a text file that contains system details. You can use syntax and options with the ICT commands.

Syntax

- `ict --cmd collect [--output <inventory.xml>] <uri> [<uri> ...]`
- `ict --cmd collect [--output <inventory.xml>] --input <credential_file.txt>`
- `ict --cmd generate-fc-zones --source-filers <filer-ip>[,<filer-ip>] --dest-svm <cluster-name:svm-name> --fc-switches <switch-ip>[:<vsan-id>][,<switch-ip>[:<vsan-id>] ...] <inventory_xml> [<inventory_xml> ...]`
- `ict --cmd generate-fc-zones --source-filers <filer-ip>[<filer-ip>] --dest-svm <cluster-name:svm-name> --fc-switches <switch-ip>[:<vsan-id>][,<switch-ip>[:<vsan-id>] ...] --fc-switches-target <switch-ip>[:<vsan-id>][,<switch-ip>[:<vsan-id>] ...] <inventory_xml> [<inventory_xml> ...]`
- `ict --help`
- `ict --version`

Options

The text file must contain system details of each system in a separate line:

- uri1

- uri2
- uri3

If a password is * or omitted either in the CLI or text file, then the user is prompted to enter a password in the CLI. The following options are available to run the ICT:

- `--help`

Shows the help message and exits.

- `--version`

Prints the tool version and exits.

- `--cmd [collect|generate-fc-zones]`

collect: Collects configuration and inventory information from controllers and hosts.

generate-fc-zones: Generates FC Zone planner document on a given inventory.

- `--output <filename[.xml[.gz]]>`

Specifies the location where the files are generated. If the file name is suffixed with “.gz” , then the file is compressed. This option generates two files (reports): Inventory Report and Inventory Report Workbook.

- `--input <credentials_file.txt>`

Specifies the location where the file with system credentials is saved. This option is not used in `--cmd generate-fc-zones`.



Only ASCII encoded text file is supported.

- uri

`format(ontap|windows|vmware|linux|cisco|brocade)://[(user|<domain_user>][:(<password>|*)]@](<hostname>|<ip>)`

Specifies the system type, IP address, and credentials of the controller or host. If the password provided is *, or if no passwords are provided, then the user is prompted to enter a password in the command line.

- `--source-filers`

Specifies comma-separated IP address of the source controllers to be used in generating the FC Zone Plan.

- `--dest-svm`

Specifies the destination clustered Data ONTAP SVM formatted as `cluster-name:svm-name` to be used in generating the FC Zone Plan.

- `--fc-switches`

Lists the FC switches for which the FC Zone Plan has to be generated. It is a comma-separated list of switch identifiers. For Cisco, FC switches should be formatted as `switch-ip:vsan-id` and for Brocade,

FC switches should be formatted as *switch-ip*. For example, 10.61.187.6:200,10.61.187.7:200 (Cisco) or 10.61.187.4,10.61.187.5 (Brocade)

- *--fc-switches-target*

Specifies the list of FC switches (connected to the cluster) for which the FC Zone Plan has to be generated. It is a comma-separated list of target switch identifiers that are listed in the same sequence as origin FC switches (*--fc-switches*). The FC zoning script is generated for each origin switch added to the *fc-switches* parameter list. This is an optional parameter.

For FC Zone Planner, input inventory XMLs are given as unnamed arguments.

Collecting inventory and generating inventory report

You can collect information about the Data ONTAP systems (7-Mode systems and nodes of the cluster), switches, hosts, and host applications. By using this information, you can generate inventory report that contains detailed information about the 7-Mode systems, hosts, and host applications for transition assessment.

- You must have downloaded the *ict.exe* file from the NetApp Support Site.
- You must have the user name, password, and IP addresses of the storage systems and hosts for which the inventory report is required.
- The user name for the storage system and hosts must have sufficient privileges to execute the commands.
- If you are adding multiple systems for inventory collection, you must have created a text file that is encoded in ASCII or UTF-8 format and contains the system details, one system per line.

Each system detail must be in the following format:

```
(ontap|windows|vmware|linux|cisco|brocade)://[(domain_user\|user):[password]@]  
(host_name|ip)
```

If you provide *** as the password, you are prompted to enter the password at the command line.

- All features must be configured and their licenses must be enabled so that the workbook can contain the inventory information about the features.
- All storage system configurations, such as CIFS share names, user names, and group names, must be in the UTF-8 format.
- For the FC zone plan, the 7-Mode systems and hosts must be connected to the switch.

The cluster can be connected either to the same switch as the 7-Mode system or to a new switch in the same fabric.

The Inventory Collect Tool can collect configuration information from a maximum of four controllers and 20 hosts simultaneously. However, for scaled configurations with quotas, qtrees, exports, or UNIX users and groups, it might take a significantly longer time for the inventory report to be generated.



You should avoid performing inventory collection operations on active storage controllers during peak hours.

1. In the Windows command prompt, navigate to the path where the Inventory Collect Tool is downloaded.
2. Generate the inventory report by running the `ict` command with the system IP address and credentials:

If you want to provide information...	Enter the following command...
<p>For each system by using the command-line interface</p>	<pre data-bbox="841 279 1484 380">`ict --cmd collect --output filename (ontap windows vmware linux cisco brocade)://[user domain_user]:(password*)]@[hostname)</pre> <p data-bbox="841 394 873 415">...</p> <ul data-bbox="865 453 1484 930" style="list-style-type: none"> • <code>filename</code> is the name you want to provide for the inventory report. • <code>ontap windows vmware linux</code> is the system type. <p data-bbox="889 642 1484 741">For example, for a 7-Mode storage system, the system type is <code>ontap</code> and for a Linux host, the system type is <code>linux</code>.</p> <ul data-bbox="865 779 1484 930" style="list-style-type: none"> • <code>cisco brocade</code> are the supported FC switches. • <code>user domain_user</code> and <code>password</code> are the system credentials. <p data-bbox="889 968 1484 1031">If the controller has no password, you can enter the characters <code>\"\"</code> as the password.</p> <ul data-bbox="865 1073 1484 1136" style="list-style-type: none"> • <code>hostname</code> is the IP address or host name of the controller, host, or switch.
<p>For multiple systems in a text file</p>	<pre data-bbox="841 1188 1484 1255">ict --cmd collect --output filename --input credentials_file.txt</pre> <p data-bbox="841 1293 1484 1392"><code>credentials_file.txt</code> is the text file that contains the system details and credentials for multiple systems:</p> <ul data-bbox="865 1430 1484 1703" style="list-style-type: none"> • Only text files encoded in ASCII format are supported. • If you provide <code>*</code> as the password, you are prompted to enter the password at the command line. • If the controller has no password, then you can enter <code>""</code> as the password.



If your storage system is running Windows 7 or later and you have restricted privileges to the folder where the output XML file for the inventory report will be stored, the output files are automatically stored in the `VirtualStore` directory and the application runs as usual.

The inventory report is created for a storage system and a Linux host. The reports generated are `collected_data.xml` and `collected_data_InventoryWorkbook.xml`:

```
ict --cmd collect --output collected_data ontap://root:test123@hostname1
linux://root@hostname2
```

The estimated time required for collecting inventory information per controller is displayed.

The inventory workbook and inventory report are generated in XML format.

3. View the inventory workbook in Microsoft Excel by using Microsoft Office 2007 or later versions.

You are ready to import the inventory report XML to the 7-Mode Transition Tool to assess the features and functionalities of the 7-Mode controller and hosts, and to identify how the features and functionalities work in the clustered Data ONTAP version selected for transition.

Generating the FC zone plan

After collecting information about the Data ONTAP systems, hosts, and FC switches, you can generate the FC zone plan, which is used to configure the switches in the cluster after migration.

- The 7-Mode systems, hosts, and the cluster must be connected to the switch.
- Information about the cluster, SVMs, FCP LIFs, and switches must be collected.

The cluster can be connected either to the same switch as the 7-Mode system or to a new switch in the same fabric.

[Supported configurations for generating an FC zone plan](#)

Steps

1. In the CLI, navigate to the ICT directory.
2. From the CLI, generate the FC zone plan:

```
ict --cmd generate-fc-zones --source-filers 7-mode-ip1,7mode-ip2 --dest-svm
cluster-name:vserver-name --fc-switches switch-name:vsan-id1,vsan-id2
7mode_cdot_switch_inventory.xml
```

You must enter the VSAN ID for the Cisco switches.

```
...bin\ict>ict --cmd generate-fc-zones --source-filers system1,system2
--dest-svm vs1:fc_zone1
--fc-switches brocade-1,brocade-2 7mode_cdot_switch_inventory.xml
```

The FC zone plan contains zones created per the igroup configurations on the 7-Mode systems. Each zone contains a single initiator WWPN and multiple SVM target WWPNs.

In a copy-based transition, you can use the FC zone plan to configure the zones either during the precutover read/write mode to verify the cluster configuration by using the test hosts, or after the cutover phase to provide data access to the initiator hosts from the cluster.

In a copy-free transition, you must use the FC zone plan to configure the zones to group the initiator hosts and targets for providing data access from the cluster during apply configuration phase.

Collection and assessment commands

The Inventory Collect Tool (ICT) collects inventory information from controllers, hosts, and FC switches by using a list of commands to generate an inventory XML report; assesses the features and functionalities of these systems; and identifies how these features and functionalities work in the clustered Data ONTAP version that is selected for transition.

ONTAP 7-Mode APIs

- `aggr-list-info`
- `cf-status`
- `cifs-homedir-paths-get`
- `cifs-list-config`
- `cifs-nbalias-names-get`
- `cifs-share-acl-list-iter-start`
- `cifs-share-list-iter-start`
- `cifs-status`
- `disk-list-info`
- `fc-adapter-list-info`
- `fpolicy-list-info`
- `igroup-list-info`
- `iscsi-interface-list-info`
- `iscsi-node-get-name`
- `license-list-info`
- `license-v2-list-info`
- `lun-get-comment`
- `lun-list-info`
- `lun-map-list-info`
- `net-config-get-active`
- `nfs-exportfs-list-rules`
- `nfs-exportfs-list-rules-2`
- `nfs-exportfs-list-rules-2`

- nfs-status
- options-get
- options-list-info
- qtree-list-iter-start
- quota-list-entries-iter-start
- quota-report-iter-start
- registry-list-info-iter-start
- sis-status
- snapmirror-get-status
- snapmirror-list-schedule
- snapmirror-list-sync-schedule
- snapshot-get-schedule
- snapshot-list-info
- snapshot-volume-info
- snapvault-primary-relationship-status-list-iter-start
- snapvault-secondary-relationship-status-list-iter-start
- snmp-status
- storage-disk-get-iter
- system-available-replication-transfers
- system-get-info
- system-get-ontapi-version
- system-get-version
- useradmin-group-list
- useradmin-role-list
- useradmin-user-list
- vfiler-get-allowed-protocols
- vfiler-get-status
- vfiler-list-info
- volume-charmap-get
- volume-get-filer-info
- volume-get-language
- volume-list-info-iter-start
- volume-options-list-info

ONTAP 7-Mode CLI

- `cifs shares`
- `ic primary show`
- `ifconfig -a`
- `ifconfig vip`
- `ifgrp status`
- `ls $volumes_path/metadir/slag/`
- `printflag wapl_metadata_visible`
- `rdfile $root_vol/etc/cifsconfig_share.cfg`
- `rdfile $root_vol/etc/group`
- `rdfile $root_vol/etc/hosts`
- `rdfile $root_vol/etc/krb5auto.conf`
- `rdfile $root_vol/etc/mcrc`
- `rdfile $root_vol/etc/netgroup`
- `rdfile $root_vol/etc/nsswitch.conf`
- `rdfile $root_vol/etc/passwd`
- `rdfile $root_vol/etc/resolv.conf`
- `rdfile $root_vol/etc/snapmirror.conf`
- `rdfile $root_vol/etc/symlink.translations`
- `rdfile $root_vol/etc/usermap.cfg`
- `rdfile $vfiler_roots/etc/cifsconfig_share.cfg`
- `rdfile $vfiler_roots/etc/group`
- `rdfile $vfiler_roots/etc/hosts`
- `rdfile $vfiler_roots/etc/krb5auto.conf`
- `rdfile $vfiler_roots/etc/mcrc`
- `rdfile $vfiler_roots/etc/netgroup`
- `rdfile $vfiler_roots/etc/nsswitch.conf`
- `rdfile $vfiler_roots/etc/passwd`
- `rdfile $vfiler_roots/etc/resolv.conf`
- `rdfile $vfiler_roots/etc/snapmirror.conf`
- `rdfile $vfiler_roots/etc/symlink.translations`
- `rdfile $vfiler_roots/etc/usermap.cfg`
- `rlm status`

- `routed status`
- `route -sn`
- `setflag wafl_metadata_visible 0`
- `setflag wafl_metadata_visible 1`
- `snapvault status -l`
- `sysconfig -A`
- `uptime`
- `vfiler status -a`
- `vlan stat`

ONTAP 7-Mode NetApp Manageability SDK

- `cluster-identity-get`
- `cluster-node-get-iter`
- `fcg-adapter-get-iter`
- `fcg-initiator-get-iter`
- `fcg-interface-get-iter`
- `lun-get-iter`
- `lun-map-get-iter`
- `net-interface-get-iter`
- `system-get-node-info-iter`
- `system-get-version`
- `volume-get-iter`
- `vserver-get-iter`

Windows

- ``HKEY_LOCAL_MACHINE\SOFTWARE\NetApp*`
- `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\Windows\CurrentVersion\Uninstall`
- `select * from MPIO_Registered_DSM`
- `select * from MScluster_Cluster`
- `select * from MScluster_Disk`
- `select * from MScluster_Node`
- `select * from MScluster_NodeToActiveResource`
- `select * from MScluster_Resource`
- `select * from MScluster_ResourceToDisk`

- `select * from MSFC_FCAdapterHBAAttributes`
- `select * from MSFC_FibrePortHBAAttributes`
- `select * from MSiSCSI_HBAInformation`
- `select * from MSiSCSIInitiator_MethodClass`
- `select * from Win32_ComputerSystem`
- `select * from Win32_DiskDrive`
- `select * from Win32_OperatingSystem`
- `select * from Win32_PnPSignedDriver where DeviceClass = "SCSIADAPTER"`
- `select * from Win32_Product`

Linux CLI

- `blkid`
- `cat /boot/grub/device.map`
- `cat /etc/grub.conf`
- `cat /etc/iscsi/initiatorname.iscsi`
- `cman_tool nodes`
- `cman_tool status`
- `df -h`
- `dmidecode -t system`
- `find /etc -maxdepth 1 -name *-release -type f -print -exec cat -v {} \;`
- `for file in /sys/block/sd***; do echo ${file/#\}/sys; scsi_id -p 0x80 -g -x -a -s ${file/#\}/sys; done`
- `for file in /sys/class/scsi_host/*; do echo -n "$ent: "; if [-f "${ent}"]; then if [-r "${ent}"]; then cat -v -s ${ent} 2>/dev/null; if ["$?" != "0"]; then echo; fi; fi; else echo; fi; done; done`
- `for file in /sys/class/fc_host/*; do echo -n "$ent: "; if [-f "${ent}"]; then if [-r "${ent}"]; then cat -v -s ${ent} 2>/dev/null; if ["$?" != "0"]; then echo; fi; fi; else echo; fi; done; done`
- `iscsiadm -m node`
- `lsb_release -a`
- `lvdisplay -m`
- `mount`
- `rpm -qa --qf "%{NAME} %{SUMMARY} %{VENDOR} ____ %{PROVIDEVERSION} \n"`
- `sanlun fcp show adapter -v`
- `sanlun lun show -pv`
- `sanlun lun show -v`

- `sanlun version`
- `san_version`
- `sfdisk -uS -l`
- `uname -a`
- `vxclustadm nidmap`
- `vxclustadm -v nodestate`

VMware CLI

- `esxcfg-info -a -F xml`
- `esxcfg-mpath -l`
- `esxcfg-scsidevs -a`
- `esxcfg-scsidevs -l`
- `esxcli software vib get`
- `find /proc/scsi -type f | while read line; do echo $line; cat $line; done`
- `san_version`
- `uname -m`
- `uname -n`
- `/usr/lib/vmware/vmkmgmt_keyval/vmkmgmt_keyval -a`
- `/usr/lib/vmware/vm-support/bin/dump-vmdk-rdm-info.sh $vmx_paths`
- `vim-cmd /vmsvc/getallvms`
- `vim-cmd vmsvc/snapshot.get $vm_ids`
- `vmkload_mod -s nmp`
- `vmware -l`
- `vmware -v`

Cisco CLI

- `show fcdomain domain-list`
- `show flogi database`
- `show switchname`
- `show version`
- `show vsan`
- `show zoneset`
- `show zoneset active`
- `uname -m`

- `nsshow`
- `switchshow`
- `version`
- `zoneshow`
- `vim-cmd vmsvc/snapshot.get $vm_ids`
- `vmkload_mod -s nmp`
- `vmware -l`
- `vmware -v`

Brocade CLI

- `nsshow`
- `switchshow`
- `version`
- `zoneshow`

Where to find information about transition assessment

You can find information about assessing storage systems, hosts, and host applications to verify that they are ready for transition in the [7-Mode Transition Tool Copy-Based Transition Guide](#). The guide provides details about how to import the inventory report you created for controllers and hosts and how to assess these controllers and hosts to verify that they are ready for transition.

Copyright Information

Copyright © 2021 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.