



XCP v1.5

User Guide

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XCP Overview

NetApp XCP is a client-based software for any-to-NetApp and NetApp-to-NetApp data migrations and file system insights. XCP is designed to scale and achieve greater performance by utilizing all the available system resources to handle high-volume data sets and high-performance migrations. XCP helps you to get complete visibility into the file system with the option to generate customer reports.

NetApp XCP is command line software available in a single package supporting NFS and SMB protocols. For NFS data sets XCP is available as a Linux binary and for SMB, XCP is available as a windows executable.

NetApp XCP supports various command line options. See the protocol specific XCP command reference sections for more information:

[XCP NFS Command Reference](#)

[XCP SMB Command Reference](#)

Software and Licensing

This section outlines the minimum hardware and software requirements for installing NetApp XCP.

Software Download

You can download XCP from the [NetApp Support site](#). NetApp employees can download the software using Single Sign-On (SSO) logins. Partners and customers need a valid NetApp Support ID with login credentials to download the software.

License

NetApp offers a free 90-day XCP license. You can obtain the license file from <https://xcp.netapp.com>. Licensing portal offers different licensing options. Select the type of license to request the license. The license should be installed and configured in the source and target NetApp ONTAP® systems.

The Licensing types available on the portal are as follows:

PS project. This license type is for cases where XCP is used in a customer engagement based upon a PS delivery project. Always choose this type when a project exists, because it provides NetApp with better usage statistics to help with the future development of XCP.

For a customer. Choose this type when you are requesting a license on behalf of a customer to use XCP in a customer environment without a dedicated PS delivery project. Typical cases are for general file management activities by residencies or partners.

Sandbox. When you want to test XCP in a lab or a nonproduction environment, choose this license. Statistics may be sent back to NetApp but are excluded from the overall reporting.

Note: PS project license type is visible for NetApp account with SSO login only

XCP Host System Requirements

Table 1) XCP Host System Requirements.

	NFS	SMB
System	64-bit Intel or AMD server, minimum 4 cores and 8GB RAM	
Operating System & Software	<ul style="list-style-type: none">Recent Linux distribution (RHEL 5.11 or later or kernel 2.6.18-404 or later)	<ul style="list-style-type: none">Windows 2008 R2 or aboveMicrosoft Visual C++ 2017 redistributable must be installed on the XCP host.
Special Requirements	<ul style="list-style-type: none">Network connectivity and root level access to source and destination NFSv3 exportsNo other active applicationsAccess to log in as root or to run sudo commands	<ul style="list-style-type: none">The Source storage system, XCP host, and the target ONTAP system must be part of same Active Directory domain
Storage	<ul style="list-style-type: none">20MB of disk space for the XCP binary and at least 50MB of disk space for the logs that are stored in the /opt/NetApp/xFiles/xcp/ directory.	<ul style="list-style-type: none">20MB of disk space for the XCP binary and at least 50MB of disk space for the logs that are stored in the C:\NetApp\XCP directory
Supported Protocol Ver	NFSv3 and NFSv4 (over TCP only)	All SMB protocol versions

XCP NFS

XCP NFS uses Linux client host systems to generate parallel I/O streams and fully utilize available network and storage performance.

For the optimal performance and reliability, NetApp recommends setting the following Linux kernel TCP performance parameters in `/etc/sysctl.conf` on the XCP Linux client host. Run `sysctl -p` or the `reboot` command to commit the changes:

```
net.core.rmem_default = 1342177
net.core.rmem_max = 16777216
net.core.rmem_max = 16777216
net.core.wmem_default = 1342177
net.core.wmem_max = 16777216
net.ipv4.tcp_rmem = 4096 1342177 16777216
net.ipv4.tcp_wmem = 4096 1342177 16777216
net.core.netdev_max_backlog = 300000
net.ipv4.tcp_fin_timeout = 10
```

XCP NFS Catalog

XCP saves operation reports and metadata in an NFSv3 - accessible catalog directory. Provisioning the catalog is a one-time preinstallation task requiring:

- A NetApp NFSv3 export for security and reliability
- At least 10 disks or solid-state drives in the aggregate containing the export for performance
- Storage configured to allow root access to the catalog export for the IP addresses of all Linux clients used to run XCP (multiple XCP clients can share a catalog location)
- Approximately 1GB of space for every 10 million objects (directories + files + hard links) to be indexed; each copy that can be resumed or synched and each offline-searchable scan requires an index

Note: XCP catalogs should be stored separately. They should not be located on either the source or destination NFS export directory. XCP maintains metadata—reports in the catalog location specified during the initial setup. The location for storing the reports needs to be specified and updated before you run any operation with XCP. Edit the `xcp.ini` file using an appropriate Linux file editor at `/opt/NetApp/xFiles/xcp/`. For more information, refer to “XCP NFS Installation.”

XCP NFS Storage

XCP NFS transitions and migrations have the following source and target storage requirements:

- Source and target servers should have NFSv3 protocol service enabled. For NFSv4 ACL migration, the destination server must have NFSv4 protocol service enabled and NFSv4 ACL.
- Source and target volumes should be exported with root access to the XCP Linux client host.

- Configure the source for NFSv3 and NFSv4 exports as read-only so administrators cannot accidentally modify it.
- If the source file system is on SAN or DAS storage, add the file system to the Linux NFS exports giving root access and read-only permission to the host running XCP.

For example, on RHEL/OEL/CentOS systems, the following commands enable XCP to scan and copy from the source:

```
# echo '/export 10.45.45.100(ro,no_root_squash)' >> /etc/exports
# sudo service nfs restart
```

- If the target file system is on a NetApp LUN (FAS, E-Series, NetApp FlashRay® system), add the file system to the Linux NFS export giving root access and read-write permission to the host running XCP. Then add the async option for performance.

For example, on RHEL/OEL/CentOS systems, the following commands enable XCP to scan and copy to target:

```
# echo '/export 10.45.45.100(rw,no_root_squash, async)' >> /etc/exports
# sudo service nfs restart
```

XCP NFS Installation

This section details the procedure for the initial setup of XCP on a Linux client.

Task Table 1) XCP NFS initial setup procedure.

Step	Action
1.	Copy the XCP binary “xcp-nfs-v1.5.tgz” on a Linux client host.
2.	On the Linux client, extract the archive. [root@localhost /]# tar zxvf ./xcp-nfs-v1.5.tgz
3.	After extracting the archive, change the working directory to /linux. [root@localhost /]# cd /linux/ [root@localhost linux]#
4.	Display the list of files and subdirectories under the current working directory. Verify that the xcp file has read-write-execute permissions to the superuser (root). [root@localhost linux]# ls -alt total 20860 drwxr-xr-x 2 root root 17 Jan 11 2019 . drwxr-xr-x 3 root root 65 Jan 11 03:22 .. Note: -rwxr-xr-x 1 root root 21360432 Jan 8 17:29 xcp Modify the file permissions and make the file executable using the chmod 755 command and you may copy the xcp binary to “/”
5.	Run the xcp show or xcp help command. An error message appears indicating that the license is not activated.

Step	Action
	<pre>[root@localhost /]# ./xcp show localhost</pre> <p>This copy is not licensed.</p> <p>xcp: Host config directory not found. Creating at '/opt/NetApp/xFiles/xcp' xcp: Host config file not found. Creating sample at '/opt/NetApp/xFiles/xcp/xcp.ini' Command: show Paths: ['localhost']</p> <p>xcp: ERROR: License file /opt/NetApp/xFiles/xcp/license not found. Register for a license at https://xcp.netapp.com/ [root@localhost /]#</p> <p>Note: The XCP host configuration directory and files are created at /opt/NetApp/xFiles/xcp, when the xcp show command is run for the first time.</p>
6.	Copy the recently downloaded license file to the Linux host at /opt/NetApp/xFiles/xcp/.
7.	<p>Verify that the license file was copied at /opt/NetApp/xFiles/xcp/.</p> <pre>[root@localhost xcp]# ls -alt</pre> <pre>total 24</pre> <pre>-rw-r--r-- 1 root root 8459 Jun 3 08:36 xcp.log</pre> <pre>drwxr-xr-x 2 root root 59 Jun 3 08:27 .</pre> <pre>-rw-r--r-- 1 root root 65 Jun 3 08:27 xcp.ini</pre> <pre>-rw-r--r-- 1 root root 128 Jun 3 04:12 host</pre> <pre>drwxr-xr-x 3 root root 16 Jun 3 04:09 ..</pre> <pre>-rw-r--r-- 1 root root 208 Jun 3 02:48 license</pre>
8.	<p>Activate the XCP license on the Linux client.</p> <pre>[root@localhost /]# ./xcp activate</pre> <p>XCP activated</p>
9.	<p>Verify that the license error has disappeared.</p> <pre>[root@localhost /]# ./xcp show localhost</pre> <p>xcp: ERROR: Catalog inaccessible: Cannot mount nfs_server:/export[:subdirectory] Failed with 'socket connect to nfs_server tcp 111 pmap2 c0: [Errno -2] Name or service not known'</p> <p>xcp: HINT: Verify the settings in the host config file /opt/NetApp/xFiles/xcp/xcp.ini.</p> <p>Sending statistics...</p>

Step	Action
10.	<p>Add the catalog location for the XCP server in the host configuration file using the vi editor.</p> <p>Note: Catalog location should be exported before modifying the details in the xcp.ini XCP configuration file. Catalog location (NFSv3) should be mountable by the XCP Linux host but not necessarily be mounted.</p> <pre>[root@localhost /]# vi /opt/NetApp/xFiles/xcp/xcp.ini</pre>
11.	<p>Verify that the XCP Linux client host configuration file entries for the catalog were modified.</p> <pre>[root@localhost /]# cat /opt/NetApp/xFiles/xcp/xcp.ini # Sample xcp config [xcp] catalog = 10.61.82.210:/vol/xcpvol/</pre>
12.	<p>Run the ./xcp command and verify that no errors were reported for license and catalog configuration.</p> <pre>[root@localhost /]# ./xcp</pre> <p>USAGE</p> <pre>xcp [scan] [options] path xcp show [options] servers xcp copy/verify [options] source_path target_path</pre> <p>Path format</p> <pre>server:export[:subdirectory]</pre>

XCP NFS Command Reference

This section provides the list of available commands for XCP NFS. Each command has additional parameters and can be used alone or in combination as required.

Table 2) XCP NFS Command Reference.

Feature	Description
Core Engine Innovations	<ul style="list-style-type: none"> • Supports Linux, CLI only • Extreme performance (~25x comparable tools)

	<ul style="list-style-type: none"> • Multiple layers of granularity (qtrees, subdirectories, criteria-based filtering) • Easy deployment (64-bit Linux host-based software)
"help"	<p>Displays information about XCP commands and options to be used.</p> <p>Use "help info" to display documentation, examples and tuning recommendations.</p>
"show"	<p>Discovery of servers and file systems.</p> <p>-v: show more detailed information about servers</p>
"activate"	<p>Activates XCP license on Linux client host systems</p>
"scan"	<ul style="list-style-type: none"> • Scoping and dashboarding of the directories, files, and data in the file systems. • l, -q: File listing output formats • stats, -csv, -html: Tree statistics report formats • nonames: Do not look up user and group names for file listings or reports • newid <name>: Catalog name for a new index

	<ul style="list-style-type: none"> • <code>id <name></code>: Catalog name of a previous copy or scan index • <code>match <filter></code>: Only process files and directories that match the filter • <code>fmt <string expression></code>: formatted output • <code>du</code>: Summarize space usage of each directory including subdirectories • <code>md5</code>: Checksum the files (also save the checksums when indexing) (default: False) • <code>duk</code>: Same as <code>du</code>, with output in kilobytes • <code>depth <n></code>: limit the search depth • <code>dircount <n[k]></code>: Request size for reading directories (default: 64k) • <code>edupe</code>: Include dedupe estimate in reports (see documentation for details) • <code>bs <n[k]></code>: read/write block size for scans which read data with <code>-md5</code> or <code>-edupe</code> (default: 64k) • <code>parallel <n></code>: Maximum concurrent batch processes (default: 7)
--	--

	<ul style="list-style-type: none"> • nold: Disables the creation of a default index (default: False) • subdirs: return names of top level sub-dirs in a directory
"copy"	<ul style="list-style-type: none"> • Any to NetApp (third-party FSs, UNIX SAN/DAS/NAS to FAS, E-Series). • newid <name>: Catalog name for a new index • md5: Checksum the files (also save the checksums when indexing) (default: False) • edupe: Include dedupe estimate in reports (see documentation for details) • nonames: Do not look up user and group names for file listings or reports • bs <n[k]>: read/write block size (default: 64k) • -dircount <n[k]>: Request size for reading directories (default: 64k) • -parallel <n>: Maximum concurrent batch processes (default: 7) • -nold: Disables the creation of a default index (default: False)

	<ul style="list-style-type: none"> • -match <filter>: Only process files and directories that match the filter
"license"	Displays XCP license information.
"license update"	Retrieve the latest license from the XCP server
"resume"	<p>Fast log-based recovery of in-progress jobs.</p> <ul style="list-style-type: none"> • id <name>: Catalog name of a previous copy index • bs <n[k]>: read/write block size (default: 64k) • dircount <n[k]>: Request size for reading directories (default: 64k) • parallel <n>: Maximum concurrent batch processes (default: 7) • dircount <n[k]>: Request size for reading directories (default: 64k)
"sync"	<p>Differential incremental updates from source to target at the file level.</p> <ul style="list-style-type: none"> • id <name>: Catalog name of a previous copy index • snap <name or path>: Access a snapshot of the source tree

	<ul style="list-style-type: none"> • nonames: Do not look up user and group names for file listings or reports • bs <n[k]>: read/write block size (default: 64k) • dircount <n[k]>: Request size for reading directories (default: 64k) • parallel <n>: Maximum concurrent batch processes (default: 7) • match <filter>: Only process files and directories that match the filter
"sync dry-run"	<p>Find source changes but don't apply them to the target.</p> <ul style="list-style-type: none"> • id <name>: Catalog name of a previous copy index • snap <name or path>: Access a snapshot of the source tree • stats: deep scan the modified directories and report on everything that's new • nonames: Do not look up user and group names for file listings or reports • v, -l, -q: File listing output formats • dircount <n[k]>: Request size for reading directories (default: 64k)

	<ul style="list-style-type: none"> • parallel <n>: Maximum concurrent batch processes (default: 7) • target: Check that the target files match the index
"verify"	<ul style="list-style-type: none"> • Three levels of assurance: statistics, structure, and full data bit by bit. • stats, -csv: Scan source and target trees in parallel and compare tree statistics • nodata: Do not check data • noattrs: Do not check attributes • nomods: Do not check file modification times • mtimewindow <s>: Acceptable modification time difference for verification • newid <name>: Catalog name for a new index • v, -l: Output formats to list any differences found • nonames: Do not look up user and group names for file listings or reports • match <filter>: Only process files and directories that match the filter

	<ul style="list-style-type: none"> • <code>bs <n[k]></code>: read/write blocksize (default: 64k) • <code>parallel <n></code>: Maximum concurrent batch processes (default: 7) • <code>dircount <n[k]></code>: Request size for reading directories (default: 64k) • <code>newdata <id name></code>: Verify full structure + names + attributes plus new data from the last sync • <code>nold</code>: Disables the creation of a default index (default: False)
"delete"	Delete everything in given path.
License Management Portal	Several types of renewable free licenses are available with options for connected and offline environments
Logging and Reporting	Events, sources, targets, files, data, and performance

help

The help command displays a list of commands, command parameters, and a brief description of each. The command is very useful for beginners who are new to XCP.

Syntax

```
[root@localhost /]# ./xcp help
```

Example

```
[root@localhost /]# ./xcp help
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
help: Display information about commands and options
```


help info: Display documentation, examples and tuning recommendations

show: Request information from hosts about NFS and other RPC services

- v: show more detailed information about servers

scan: Read all the directories in a file tree or a saved index

- l, -q: File listing output formats
- stats, -csv, -html: Tree statistics report formats
- nonames: Do not look up user and group names for file listings or reports
- newid <name>: Catalog name for a new index
- id <name>: Catalog name of a previous copy or scan index
- match <filter>: Only process files and directories that match the filter
- fmt <string expression>: formatted output
- du: Summarize space usage of each directory including subdirectories
- md5: Checksum the files (also save the checksums when indexing) (default: False)
- duk: Same as du, with output in kilobytes
- depth <n>: limit the search depth
- dircount <n[k]>: Request size for reading directories (default: 64k)
- edupe: Include dedupe estimate in reports (see documentation for details)
- bs <n[k]>: read/write blocksize for scans which read data with -md5 or -edupe (default: 64k)
- parallel <n>: Maximum concurrent batch processes (default: 7)
- noId: Disables the creation of a default index (default: False)
- subdir-names: return names of top level sub-dirs in a directory

copy: Recursively copy everything from source to target

- newid <name>: Catalog name for a new index
- md5: Checksum the files (also save the checksums when indexing) (default: False)
- edupe: Include dedupe estimate in reports (see documentation for details)
- nonames: Do not look up user and group names for file listings or reports
- bs <n[k]>: read/write blocksize (default: 64k)
- dircount <n[k]>: Request size for reading directories (default: 64k)
- parallel <n>: Maximum concurrent batch processes (default: 7)
- noId: Disables the creation of a default index (default: False)

-match <filter>: Only process files and directories that match the filter

verify: Verify that the target is the same as the source

[no options]: Full verification of target structure, names, attributes and data

-stats, -csv: Scan source and target trees in parallel and compare tree statistics

-nodata: Do not check data

-noattrs: Do not check attributes

-nomods: Do not check file modification times

-mtimewindow <s>: Acceptable modification time difference for verification

-newid <name>: Catalog name for a new index

-v, -l: Output formats to list any differences found

-nonames: Do not look up user and group names for file listings or reports

-match <filter>: Only process files and directories that match the filter

-bs <n[k]>: read/write blocksize (default: 64k)

-parallel <n>: Maximum concurrent batch processes (default: 7)

-dircount <n[k]>: Request size for reading directories (default: 64k)

-newdata <id name>: Verify full structure + names + attributes plus new data from the last sync

-noId: Disables the creation of a default index (default: False)

sync: Find all source changes and apply them to the target

-id <name>: Catalog name of a previous copy index

-snap <name or path>: Access a snapshot of the source tree

-nonames: Do not look up user and group names for file listings or reports

-bs <n[k]>: read/write blocksize (default: 64k)

-dircount <n[k]>: Request size for reading directories (default: 64k)

-parallel <n>: Maximum concurrent batch processes (default: 7)

-match <filter>: Only process files and directories that match the filter

sync dry-run: Find source changes but don't apply them to the target

-id <name>: Catalog name of a previous copy index

-snap <name or path>: Access a snapshot of the source tree

-stats: deep scan the modified directories and report on everything that's new

-nonames: Do not look up user and group names for file listings or reports

-v, -l, -q: File listing output formats

```

    -dircount <n[k]>: Request size for reading directories
(default: 64k)
    -parallel <n>: Maximum concurrent batch processes (default: 7)
    -target: Check that the target files match the index

resume: Restart an interrupted copy
    -id <name>: Catalog name of a previous copy index
    -bs <n[k]>: read/write blocksize (default: 64k)
    -dircount <n[k]>: Request size for reading directories
(default: 64k)
    -parallel <n>: Maximum concurrent batch processes (default: 7)
    -parallel <n>: Maximum concurrent batch processes (default: 7)
    -dircount <n[k]>: Request size for reading directories
(default: 64k)

activate: Activate a license on the current host

license: Show xcp license info

```

license update: Retrieve the latest license from the XCP server

Parameters

The following table describes the help parameters.

Feature	Description
help info	Display documentation, examples, and tuning recommendations.

help info

Display documentation, examples, and tuning recommendations.

```

[root@localhost /]# ./xcp help info
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
One file to rule them all

USAGE
    xcp show [options] hosts
    xcp [scan] [options] path
    xcp copy/verify [options] source_path target_path
    xcp sync/resume [options] -id name

Path format
    server:export[:subdirectory]

Multipath format
    server1addr1,server1addr2,...:export[:subdirectory]

Documentation

```

commands and options: xcp help [command]
features, performance tuning, examples: xcp help info
(no options): scan and list a file tree

EXAMPLES

Query a server to see its RPC services and NFS exports;
print a human-readable tree report for one of the NFS exports;
and list all the files from the root of a subdirectory:

```
xcp show server.abc.com
xcp scan -stats server.abc.com:/tmp
xcp scan -l server.abc.com:/tmp:/test
```

Copy from a local SAN or DAS filesystem (requires local NFS service):

```
sudo xcp copy localhost:/home/smith cdot:/target
```

Three-level verification: compare stats, attributes, and full data:

```
sudo xcp verify -stats localhost:/home/smith cdot:/target
sudo xcp verify -nodata localhost:/home/smith cdot:/target
sudo xcp verify localhost:/home/smith cdot:/target
```

Please run "xcp help" to see the commands and options

Please run "xcp help info" to see the user guide, including more examples...

DESCRIPTION

When run as "xcp <path>", without any options, xcp recursively scans the tree rooted at the

path and prints the list of all the files. Options such as -l can change the format; option

-md5 makes xcp read each file and print the checksums in the output. Filters (see below)

can select which directories to enter and which files to process.

If -newid is used, the reports and logs and metadata index of searches and copies are

saved in the catalog tree. Using a new id also allows xcp to resume an interrupted job,

such as a copy or a scan. Each index requires about 1GB of space for every 10 million files.

If -md5 (or another option which enables checksumming such as -edupe) is used during the

copy, the index will also contain the data checksums of each file. Note that checksums are

not used by xcp for anything; the verify feature uses a full byte-by-byte data comparison.

Recommended use is to put the source in read-only mode during scan/copy/sync.

All file IO (except for the local diagnostic output) is done using the NFS engine in xcp which bypasses the local OS client.

When run as root, the program uses reserved source ports for the NFS3 and MNT3 sockets.

Although xcp is many times faster than find, du, cp or rsync; xcp uses much more CPU and memory.

To boost the performance of crawls use faster CPUs, and to boost performance of other tasks

(filtering, copying, etc) use a multi-core system with a lot of memory; copying a large,

deep tree with millions of files may require a few gigabytes of RAM on the system where xcp is running.

To migrate an entire multiuser file tree at once, it usually works best to export the source

to a host with read-only and root access, and then from that host run xcp as root.

For non-NFS filesystems (SAN + DAS) use the Unix/Linux host as the NFS server so that xcp

can stream requests at the filesystem

For example; to access a SAN filesystem mounted on /local on Linux just add the following to

/etc/exports and restart the Linux NFS services (typically "sudo service nfs restart"):

```
/localsrc localhost(ro,no_root_squash)
/localdest localhost(rw,no_root_squash,async)
```

The xcp path to scan /localsrc would then be "localhost:/localsrc".

NOTE: to copy files to a filesystem through the Linux NFS server, the async option improves

performance tremendously and setting RPCNFSDCOUNT=128 in /etc/sysconfig/nfs and restarting

nfs services may improve write performance (for RHEL/CentOS; other distros may vary)

OUTPUT

In the `-l` output the size, space used, and modification time are all shown in human-readable format. Time is relative to the current time so it is timezone-independent. E.g. "14dlh" means the file was modified 14 days and one hour ago. Note: "current time" is actually the time when xcp started. The timestamp is saved in the index metadata (catalog:/xFiles/indexes/*.json) and will be used for reports against the index.

The `-stats` option prints a human-readable report to the console; other report format options are `-html` or `-csv`. The csv format has exact values. Csv and html reports are automatically saved in the catalog if there is one.

The histograms for modified, accessed, and changed only count regular files.

FILTERS

A filter expression should evaluate to True or False in Python.

See below for some examples with the `-match` filters.

Variables and file attributes currently available to use in a filter:

modified, accessed, changed: floats representing age in hours
depth, size, used, uid, gid, type, nlinks, mode, fileid: integers
name, base, ext: strings (if name is "demo.sql" then base=="demo" and ext==".sql")
owner, group: strings
size units: k, m, g, t, p = K, M, G, T, P = 1024, 1048576, 2**30, 2**40, 2**50
file types: f, d, b, c, l, s, q = F, D, B, C, L, S, Q = 1, 2, 3, 4, 5, 6, 7

Functions available to use in a filter:

rxm(pattern): regular expression match for each file name
fnm(pattern): unix-style wildcard match for each file name
load(path): a list of lines from a local (external) file
rand(N): match 1 out of every N files at random
path(pattern): wildcard match for the full path
Note: unlike most shell wildcards, pattern `"/a/*"` will match path `/a/b/c`

The rxm() function only runs `python re.compile(pattern)` once
Similarly, load() only reads its file once

Filter examples:

Match files modified less than half an hour ago

```
-match "type == f and modified < .5"
```

Find anything with 'core' in the name ("in" is a python operator)

```
-match "'core' in name"
```

Same match using regular expressions:

```
-match "rxm('.*core.*')"
```

Same match using wildcards:

```
-match "fnm('*core*')"
```

Match files that are not regular files, directories, or links:

```
-match "type not in (f,d,l)"
```

Find jpg files over 500 Megabytes (note M is a variable)

```
-match "fnm('*.*jpg') and size > 500*M"
```

Find files with "/demo/smith" in the path (x is the file; str(x) is its full path)

```
-match "'/demo/smith' in str(x)"
```

Xcp prints size units according to the international standard, i.e. it shows a base 2 kilobyte

as "1 KiB", a megabyte as "1 MiB", etc; however for easier typing in filters the variable

names for size units are K = 1KiB, M = 1MiB, etc. In both cases the values represented are

powers of 2. File counts are shown with abbreviations of powers of 10, e.g. 1.1M = 1.1 million.

PERFORMANCE

On Linux please set the following in /etc/sysctl.conf and run "sysctl -p":

```
net.core.rmem_default = 1342177
net.core.rmem_max = 16777216
net.core.wmem_default = 1342177
net.core.wmem_max = 16777216
net.ipv4.tcp_rmem = 4096 1342177 16777216
net.ipv4.tcp_wmem = 4096 1342177 16777216
net.core.netdev_max_backlog = 300000
net.ipv4.tcp_fin_timeout = 10
```

Make sure your system has multiple CPU's and at least a few GB of free memory.

Searching/checksumming/copying hundreds of thousands or millions of files should usually be many times faster with xcp than with standard tools such cp, find, du, rsync, or OS drag-and-drop.

For the case of a single file, reading/copying with xcp will be usually go faster with a faster host CPU. When processing many files, reading/copying will go faster with more cores/CPUs. The following options control when xcp will dedicate a parallel process to a batch:

- batchlen: approximate files per batch (default 5000 for copying, 50000 for searching)
- batchsize: when copying, a size threshold for the amount of data per batch (default 500M)
- giant: single-batch file threshold; giant files will get their own batch (default 900M)

Larger batch sizes will usually consume less cpu and more memory than smaller ones. The size of the index will be smaller with larger batches. These tunables are for mainly for testing purposes; usually the defaults work best.

The main performance throttle option is -parallel for the maximum number of concurrent processes as the number of concurrent directories being read and files being processed.

For small numbers of files and/or when there is a network qos limiter, you may also be able to increase performance by opening multiple channels. The usage section above shows how to use multiple host target addresses and the same syntax also opens more channels to a single target.

For example: "host1,host1:/vol/src" makes each xcp process open 2 channels to host1. In some

WAN environments this can improve performance. Within a datacenter, if there are only 1GbE NICs

on the host with XCP it usually helps to use the multipath syntax to leverage more than one NIC.

To validate that you are actually running IO over multiple paths, use OS tools to

monitor network IO. For example, on Linux try "sar -n DEV 2 200"

VERIFICATION, CHANGES, UPDATES

The verify command will compare any two file trees without using a catalog index. Verify

scans the source tree and looks up every file and directory on the target. It will also

check modification times and other file attributes including permissions and it will read

the files on both sides and compare the data. Options:

-nodata: do not verify data

-nomods: do not verify modification times

-noattrs: do not verify other attributes (type, size, permissions, uid, gid, nlinks)

The verify method is useful when trees are identical but if a source directory moved or

if its name changed, verify will not find any files under that directory even though they

are still in the target tree. In these situations a "sync dry-run" will be more effective.

Verify has one option which helps to detect and analyze trees with differences; with -stats

or -csv it will do a scan of each tree and check that the statistics of the two trees match,

such as the total number of files and directories, the number of files in the size bins (empty,

<1k, 1-8K, etc) the tree depth bins, etc. When using a catalog, all the reports will be saved.

With -l, all files with differences are listed in human-readable format with an asterisk in

front of whichever fields actually differ; in these examples the modification time of 'a' is

different and the permissions, setuid, setgid, uid, and gid of abc are all different:

```
      d rwxr-xr-x  ---  pete      pete      4KiB      4KiB  *31d4h
wave:/export/xf:src4/a                                     12m5s

      *rw-rwxr-- *ug- *pete      *pete          0          0 *1y248d
wave:/export/xf:src4/abc
      rw-rwxrw-  ---   bin       bin                                     1m24s
```

Each difference is shown with the source file on one line followed by a line with the

target side values that differ.

Differences which are not included in the output, such as number of hard links, will cause

the file to be listed without any asterisks.

The "sync dry-run" command uses the index to look for changes. In addition to detecting changes and modifications, the dry-run can also detect files that moved, were deleted, or were renamed. The first pass of the change scan reviews the index and checks every file and directory at the source for changes. This stage also detects files which no longer exist.

With -l the files are listed in the same human-readable format as verify. Note that if an attribute changed and then changed again back to its original value, the change time will be different and the file will be listed without any asterisks.

Files which were removed are shown with a '#' in front:

```
#   rw-rw-r--  ---  pete  pete      4 4KiB  1y229d
wave:/export/xf:src4/hi.txt
```

Note the following special case for modification times: the nfs3 file attributes have two values for the mtime, seconds and nanoseconds but target files copied with rsync may have the nanoseconds set to 0 and some Unix filesystem targets such as Mac OSX may also set the nanoseconds to 0. In this case, xcp will consider the mtimes the same and will print just one warning at the end that says "Found [n] files with same source + target mtime seconds but target mtime's nanosecond value is 0". To change this behavior, use the "mtimewindow" option.

The second stage reviews the index one more time and then rescans the modified directories and lists the files and directories which are new, were renamed, or were moved (or both renamed and moved). Examples:

```
+ wave:/export/xf:src4/new
+d wave:/export/xf:src4/new2
 *wave:/export/xf:src4/renamed
   wave:/export/xf:src4/f -> wave:/export/xf:src4/new/f
 *wave:/export/xf:src4/f2 ->
wave:/export/xf:src4/new/f2.renamed
```

TODO: Hard links that were removed or added should also be displayed in this stage

Note that the attributes (including modification and change times) saved in the index are scanned before copying and indexing, so all post-scan source changes can be detected.

The sync command does the same scan as sync dry-run, then makes the changes required to sync up the target with the source, and finally replaces the old index with a new one.

During the sync, modified files are recopied.

VIRTUAL FILESYSTEMS

Every xcp process serves a virtual filesystem for control, diagnostics and testing.

This capability is work in progress.

For now, the service port is 62049. If that is taken then 62050 is used, and so on.

ENVIRONMENT VARIABLES

XCP_CONFIG_DIR - Override the default location, /opt/NetApp/xFiles/xcp.

If set, the value should be an OS filesystem path; possibly to a mounted NFS dir.

When a custom config dir is set, the log file will be named xcp.hostname.log instead of the default, xcp.log.

XCP_LOG_DIR - Override the default, which is to store the xcp log in the config dir.

If set, the value should be an OS filesystem path; possibly to a mounted NFS dir.

When a custom log dir is set, the log file will be named xcp.hostname.log instead of the default, xcp.log.

XCP_CATALOG_PATH - Override the setting in xcp.ini. If set, the value should be in the xcp path format, server:export[:subdirectory].

SECURITY

All the files and directories in the catalog are world readable except for the index

files which have a ".index" suffix and are located in subdirectories under the top-level catalog "indexes" directory.

Because each index file is essentially an archive of metadata of an entire file tree,

the catalog should be stored on a NetApp volume with export permissions matching the

the actual sources and targets. Note that file data is NOT stored in the index; just metadata.

The virtual file service ports accept connections from localhost only. Connections from root are always allowed.

NOTES

- Xcp can fully utilize available network, storage, and local host resources, so it will affect other applications that need those resources.
- Copying/scanning a filesystem may cause the server to update the access times of its files and/or directories. Copying from a snapshot or a read-only export should preserve the access time information; however that is server-dependent and should be tested in an environment where access time preservation is required.
- When there are multiple hard links to a file xcp anoints the first one it finds as the "real" file and will copy it and count it in all the histograms, while the other links to the file are not counted as regular files anymore, and not copied or summed (however they will all be listed with the same checksum value as the original file, and copied by creating a link).
- Copying a set of hard links to another directory within the *same* filesystem will result in a new set of hard links because the first file will be copied in full and the rest will be links to that one.
- Most NFS errors from the source are just logged and printed and xcp will continue processing. Most errors from the target server will cause xcp to stop.
- Error messages are printed right away; however sometimes it can take a second before the most recent errors are counted in the console status line.
- ".", "..", and ".snapshot" directory entries are ignored

- A subdirectory with a new filesystem id (AKA a filesystem junction) will not be scanned.

- When using a filter, xcp's du only prints directories which have matches under them

- Blocks that are all zero are not copied so the target files will be sparse.

Both the zero-block and dedupe calculations use the default blocksize (typically 64k)

Use "-bs 4k" to get a more accurate calculation (this may be slower and use more memory)

The dedupe estimate uses checksums rather than comparing actual block data. Collisions

(different blocks with same checksum) occur very rarely with negligible effect on the result.

Dedupe estimation (-edupe) can use a lot of memory and can slow down processing

LICENSES, COPYRIGHTS

Full license and copyright information is in the accompanying NOTICES.pdf file

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MORE EXAMPLES

Recursively list all files in a subdirectory within an export:
xcp -l localhost:/usr:share

Crawl an export and save a report in html:

xcp -html jelly.corp.netapp.com:/tmp > report.html

Crawl a local filesystem print a human-readable report:

(NFS services have to be enabled on the local unix OS; see notes above)

xcp -stats localhost:/usr

List a single directory but do not enter its subdirectories

xcp -l -depth 0 server1:/vol/home:/smith/work

Find and list a file with a specific fileid (inode) number:

xcp -l -match 'fileid==671907' server1:/export

Print a report to the console for files owned by root that are over 100MB:

```
xcp -stats -match 'owner == "root" and size > 100*M'
fsl:/export
```

List regular files with ntap in the name and modified in the last half hour:

```
xcp -l -match 'modified < .5 and "ntap" in name and type==f'
server:/export
```

Scan and log a subtree on fas6280a using "ntap1" as its catalog tag:

(Look for the csv and html reports in the catalog after you run this)

```
xcp -newid ntap1 fas6280a:/vol/home:ntap
```

List the files in the catalog:

```
xcp -l `grep "catalog = " /opt/NetApp/xFiles/xcp/xcp.ini |
sed "s/. * = //"g`
```

Check every file on the source for changes (compare current metadata to

the indexed metadata that was stored in the catalog when the copy was made):

```
xcp sync dry-run -id ntap1
```

Run an html report using the index (no access to source tree is required):

```
xcp -id ntap1 -html > rpt.html
```

Copy subtree 'src' in volume 'dir1' on fas3050a to 'dst' on fas6280b:

```
xcp -copy fas3050b:/vol/dir1:src fas6280a:/vol/dir2:dst
```

List subdir 'big-files' with checksums (xcp will read and sum all files):

(For a read IO performance test, redirect output to /dev/null or use -q)

```
xcp -md5 lab6040b-data:/vol/pete1/big-files
```

Checksum 1 out of every 20 regular files at random:

```
xcp verify -match "type==f and rand(20)" server1:/src
server2:/dst
```

List an export's directory structure:

```
xcp -match "type==d" server:/fs
```

show

The show command queries the RPC services and NFS exports of one or more storage servers. The command also lists the available services and exports with the used and free capacity of each export, followed by the attributes of the root of each export.

Syntax

The show command requires the host name or IP address of the NFSv3 exported system.

```
[root@localhost /]# ./xcp show <IP address or hostname of NFS server>
```

Example

```
[root@localhost /]# ./xcp show 10.63.5.56
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

getting pmap dump from 10.63.5.56 port 111...
getting export list from 10.63.5.56...
sending 6 mounts and 24 nfs requests to 10.63.5.56...

== RPC Services ==
'10.63.5.56': UDP rpc services: MNT v1/2/3, NFS v2/3, NLM
v1/3/4, PMAP v2, RQUOTA v1, STATUS v1
'10.63.5.56': TCP rpc services: MNT v1/2/3, NFS v2/3, NLM
v1/3/4, PMAP v2, STATUS v1

== NFS Exports ==
Mounts  Errors  Server
      6      0  10.63.5.56

      Space      Files      Space      Files
      Free      Free      Used      Used Export
973 MiB  31,026  256 KiB      96 10.63.5.56:/vol/vt01
973 MiB  31,021  268 KiB     101 10.63.5.56:/vol/vs01
757 MiB  25,214  216 MiB   5,908 10.63.5.56:/vol/ex_s01
473 MiB  22,459  499 MiB   8,663 10.63.5.56:/vol/ex_s02
903 MiB  37,362  549 MiB   9,102
10.63.5.56:/vol/vol0/home
903 MiB  37,362  549 MiB   9,102 10.63.5.56:/vol/vol0

== Attributes of NFS Exports ==
drwxr-xr-x --- root root 4KiB 4KiB 213d10h 10.63.5.56:/vol/vt01
drwxr-xr-x --- root root 4KiB 4KiB 149d14h 10.63.5.56:/vol/vs01
drwxr-xr-x --- root root 4KiB 4KiB 256d13h
10.63.5.56:/vol/ex_s01
drwxr-xr-x --- root root 4KiB 4KiB 256d13h
10.63.5.56:/vol/ex_s02
drwxrwxrwx --t root root 4KiB 4KiB 256d13h
10.63.5.56:/vol/vol0/home
```

```
drwxr-xr-x --- root root 4KiB 4KiB 256d13h 10.63.5.56:/vol/vol0
5.99 KiB in (7.57 KiB/s), 11.0 KiB out (13.9 KiB/s), 0s.
```

Parameters

Feature	Description
show -v	Print verbose details about NFS servers using the IP address or host name.

License

The license command displays XCP license information. Before running this command, verify that the license file is downloaded and copied on the /opt/NetApp/xFiles/xcp/ directory on the XCP server.

Syntax

```
[root@localhost /]# ./xcp license
```

Example

```
[root@localhost /]# ./xcp license
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

Licensed to "XXX, NetApp Inc, XXX@netapp.com" until Sun Mar 31
00:00:00 2019
License type: SANDBOX
License status: ACTIVE
Customer name: N/A
Project number: N/A
Offline Host: Yes
Send statistics: No
Host activation date: N/A
License management URL: https://xcp.netapp.com
```

Parameters

Feature	Description
license update	Retrieve the latest license from the XCP server.

license update

Retrieve the latest license from the XCP server.

```
[root@localhost /]# ./xcp license update

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

License updated
```


activate

The activate command activates the XCP license. Before running this command, verify that the license file is downloaded and copied on the /opt/NetApp/xFiles/xcp/ directory on the XCP server.

Syntax

```
[root@localhost /]# ./xcp activate
```

Example

```
[root@localhost /]# ./xcp activate
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
XCP already activated
```

scan

The scan command recursively scans the entire source NFSv3 exported paths and prints the statistics of file structure at the end of the scan command. NetApp recommends that you put the source NFS export mounts in read-only mode during the scan operation.

Syntax

```
[root@localhost /]# ./xcp scan <source NFS export path>
```

Example

```
[root@localhost /]# ./xcp scan 10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (6.52 KiB/s), 740 out (1.31 KiB/s), 0s.
```

Parameters

The following table lists scan parameters and their description.

Feature	Description
scan -l	File listing output formats
scan -q	File listing output formats

Feature	Description
scan -stats	Tree statistics report formats
scan -csv	Tree statistics report formats
scan -html	Tree statistics report formats
scan -nonames	Do not look up user and group names for file listings or reports
scan -newid <name>	Catalog name for a new index
scan -id <name>	Catalog name of a previous copy or scan index
scan -match <filter>	Only process files and directories that match the filter
scan -fmt <string expression>	Formatted output
scan -du	Summarize space usage of each directory including subdirectories
scan -md5	Checksum the files (also save the checksums when indexing) (default: False)
scan -depth <n>	Limit the search depth
scan -dircount <n[k]>	Request size for reading directories (default: 64k)
scan -edupe	Include dedupe estimate in reports (see documentation for details)
scan -bs <n[k]>	Read/write block size for scans that read data with -md5 or -edupe (default: 64k)
scan -parallel <n>	Maximum concurrent batch processes (default: 7)
scan -nold	Disables the creation of a default index (default: False)
scan -subdir-names	Return names of top level sub-directories in a directory
scan -acl4	Process NFS4 ACLs

scan -l

File listing output formats.

```
[root@localhost /]# ./xcp scan -l
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

drwxr-xr-x --- root root 4KiB 4KiB 260d9h keymgr
rw-r--r-- --- root root    0    0 162d6h
keymgr/csr/secureadmin.pem
rw-r--r-- --- root root    0    0 162d6h
keymgr/cert/secureadmin.pem
```

```

rw-r--r-- --- root root      0      0 162d6h
keymgr/key/secureadmin.pem
drwxr-xr-x --- root root 4KiB 4KiB 260d9h keymgr/root
drwxr-xr-x --- root root 4KiB 4KiB 260d9h keymgr/csr
drwxr-xr-x --- root root 4KiB 4KiB 260d9h keymgr/cert
drwxr-xr-x --- root root 4KiB 4KiB 260d9h keymgr/key
  r--r--r-- --- root root      0      0 162d6h keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (3.70 KiB/s), 740 out (759/s), 0s.

```

scan -q

File listing output formats.

```

[root@localhost /]# ./xcp scan -q
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
9 scanned, 3.61 KiB in (3.60 KiB/s), 740 out (737/s), 1s.

```

scan -stats

Tree statistics report formats.

```

[root@localhost /]# ./xcp scan -stats
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

== Maximum Values ==
      Size      Used      Depth      Namelen      Dirsize
        0         0         2         15         4

== Average Values ==
      Namelen      Size      Depth      Dirsize
        8         0         1         1

== Top Space Users ==
      root
    20 KiB

== Top File Owners ==
      root
        9

== Top File Extensions ==
      .pem
        4

== Number of files ==
      empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB      >100MiB

```

```

4

== Space used ==
      empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB      >100MiB

== Directory entries ==
      empty      1-10      10-100 100-1,000      1K-10K
>10K
                        5

== Depth ==
      0-5      6-10      11-15      16-20      21-100
>100
      9

== Accessed ==
      >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
                        4

== Modified ==
      >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
                        4

== Changed ==
      >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
                        4

Total count: 9
Directories: 5
Regular files: 4
Symbolic links: None
Special files: None
Hard links: None, multilink files: None, saved: 0
Zero data: N/A
Dedupe estimate: N/A
Total space for regular files: size: 0, used: 0
Total space for symlinks: size: 0, used: 0
Total space for directories: size: 20 KiB, used: 20 KiB
Total space used: 20 KiB
9 scanned, 3.61 KiB in (3.61 KiB/s), 740 out (741/s), 0s.

```

scan -csv

Tree statistics report formats.

Note: XCP reports (.csv, .html) are saved in the catalog location specified in the xcp.ini file. The files are stored in the <catalog path>/catalog/indexes/1/reports folder. You can see sample reports in the appendix.

```
[root@localhost /]# ./xcp scan -csv
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

XCP 1.5;
date,08-Jan-2019 11:11 AM EST
scan 10.63.5.56:/vol/ex_s01/etc/keymgr
options,"{'-csv': True}"
summary,"9 scanned, 3.61 KiB in (10.7 KiB/s), 740 out (2.15
KiB/s), 0s."

Maximum Values,Size,Used,Depth,Namelen,Dirsize
Maximum Values,0,0,2,15,4
Average Values,Namelen,Size,Depth,Dirsize
Average Values,8,0,1,1
Top Space Users,root
Top Space Users,20480
Top File Owners,root
Top File Owners,9
Top File Extensions,.pem
Top File Extensions,4
Number of files,empty,<8KiB,8-64KiB,64KiB-1MiB,1-10MiB,10-
100MiB,>100MiB
Number of files,4,0,0,0,0,0,0
Space used,empty,<8KiB,8-64KiB,64KiB-1MiB,1-10MiB,10-
100MiB,>100MiB
Space used,0,0,0,0,0,0,0
Directory entries,empty,1-10,10-100,100-1,000,1K-10K,>10K
Directory entries,0,5,0,0,0,0
Depth,0-5,6-10,11-15,16-20,21-100,>100
Depth,9,0,0,0,0,0
Accessed,>1 year,>1 month,1-31 days,1-24 hrs,<1 hour,<15
mins,future
Accessed,0,4,0,0,0,0,0
Modified,>1 year,>1 month,1-31 days,1-24 hrs,<1 hour,<15
mins,future
Modified,0,4,0,0,0,0,0
Changed,>1 year,>1 month,1-31 days,1-24 hrs,<1 hour,<15
mins,future
Changed,0,4,0,0,0,0,0
Total count,9
Directories,5
Regular files,4
Symbolic links,0
Special files,0
```

```
Hard links,0,multilink files,0,saved,0
Zero data,N/A
Dedupe estimate,N/A
Total space for regular files,size,0,used,0
Total space for symlinks,size,0,used,0
Total space for directories,size,20480,used,20480
Total space used,20480
9 scanned, 3.61 KiB in (10.7 KiB/s), 740 out (2.15 KiB/s), 0s.
```

scan -html

Tree statistics report formats.

```
[root@localhost /]# ./xcp -html
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN"
"http://www.w3.org/TR/html4/strict.dtd">
<html><head>

[redacted HTML contents]

</body></html>
9 scanned, 3.61 KiB in (41.7 KiB/s), 740 out (8.34 KiB/s), 0s.
```

scan -nonames

Do not look up user and group names for file listings or reports.

Note: The -nonames option only applies to file listings with -l option in the scan command.

```
[root@localhost /]# ./xcp scan -nonames
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (7.34 KiB/s), 740 out (1.47 KiB/s), 0s.
```

scan -newid <name>

Catalog name for a new index.

```
[root@localhost /]# ./xcp scan -newid 3
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
9 scanned, 9 indexed, 13.6 KiB in (17.1 KiB/s), 52.6 KiB out
(66.1 KiB/s), 0s.
```

scan -id <name>

Catalog name of a previous copy or scan index.

```
[root@localhost /]# ./xcp scan -id 3
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/keymgr, target:
None}

keymgr/root/cacert.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/csr/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/key
keymgr/cert
keymgr

9 reviewed, 11.4 KiB in (11.7 KiB/s), 1.33 KiB out (1.37 KiB/s),
0s.
```

scan -match <filter>

Only process files and directories that match the filter.

```
[root@localhost /]# ./xcp scan -match bin
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
```

```
keymgr/root/cacert.pem
```

```
Filtered: 0 did not match
```

```
9 scanned, 9 matched, 3.61 KiB in (4.04 KiB/s), 740 out (827/s), 0s.
```

scan -fmt <string expression>

Only process files and directories that match the format.

```
[root@localhost /]# ./xcp scan -fmt "'{ }, { }, { }, { },
{ }'.format(name, x, ctime, atime, mtime)"
10.63.5.56:/vol/ex_s01/etc/raid
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

raid, 10.63.5.56:/vol/ex_s01/etc/raid, 1532934587.27,
1547211917.9, 1395438752.0
raid_lm, 10.63.5.56:/vol/ex_s01/etc/raid/raid_lm, 1532934587.27,
1547211917.9, 1395438752.0
raid_lm_config.xml,
10.63.5.56:/vol/ex_s01/etc/raid/raid_lm/raid_lm_config.xml,
1532934585.66, 1546251427.31, 1395438752.0
raid_lm_policy.xml,
10.63.5.56:/vol/ex_s01/etc/raid/raid_lm/raid_lm_policy.xml,
1532934585.67, 1546251427.31, 1395438752.0
4 scanned, 1.53 KiB in (6.39 KiB/s), 296 out (1.21 KiB/s), 0s.
```

scan -du

Summarize space usage of each directory, including subdirectories.

```
[root@localhost /]# ./xcp scan -du
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

    4KiB keymgr/csr
    4KiB keymgr/key
    4KiB keymgr/cert
    4KiB keymgr/root
   20KiB keymgr
9 scanned, 3.61 KiB in (17.1 KiB/s), 740 out (3.42 KiB/s), 0s.
```

scan -md5

Checksum the files (also save the checksums when indexing) (default: False).

Note: The checksums are not used for file verification; they are used only for file listings during scan operations.

```
[root@localhost /]# ./xcp scan -md5
10.63.5.56:/vol/ex_s01/etc/keymgr
```



```
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
d41d8cd98f00b204e9800998ecf8427e keymgr/csr/secureadmin.pem
d41d8cd98f00b204e9800998ecf8427e keymgr/cert/secureadmin.pem
d41d8cd98f00b204e9800998ecf8427e keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
d41d8cd98f00b204e9800998ecf8427e keymgr/root/cacert.pem
9 scanned, 4 summed, 3.61 KiB in (3.67 KiB/s), 740 out (753/s),
0s.
```

scan -depth <n>

Limit the search depth.

Note: This `-depth` option specifies how deep XCP can scan the files into the subdirectories.

```
[root@localhost]# ./xcp scan -depth 2
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (6.28 KiB/s), 740 out (1.26 KiB/s), 0s.
```

scan -dircount <n[k]>

Request size for reading directories (default: 64k).

```
[root@localhost /]# ./xcp scan -dircount 64k
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
```

```
keymgr/key
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (11.2 KiB/s), 740 out (2.24 KiB/s), 0s.
```

scan -edupe

Include dedupe estimate in reports.

```
[root@localhost /]# ./xcp scan -edupe
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

== Maximum Values ==

Size	Used	Depth	Namelen	Dirsize
0	0	2	15	4

== Average Values ==

Namelen	Size	Depth	Dirsize
8	0	1	1

== Top Space Users ==

```
root
20 KiB
```

== Top File Owners ==

```
root
9
```

== Top File Extensions ==

```
.pem
4
```

== Number of files ==

empty	<8KiB	8-64KiB	64KiB-1MiB	1-10MiB	10-100MiB	>100MiB
4						

== Space used ==

empty	<8KiB	8-64KiB	64KiB-1MiB	1-10MiB	10-100MiB	>100MiB

== Directory entries ==

empty	1-10	10-100	100-1,000	1K-10K	>10K
					5

== Depth ==

	0-5	6-10	11-15	16-20	21-100
>100					
	9				
== Accessed ==					
>1 year	>1 month	1-31 days	1-24 hrs	<1 hour	<15 mins
future					
		4			
== Modified ==					
>1 year	>1 month	1-31 days	1-24 hrs	<1 hour	<15 mins
future					
		4			
== Changed ==					
>1 year	>1 month	1-31 days	1-24 hrs	<1 hour	<15 mins
future					
		4			
Total count: 9					
Directories: 5					
Regular files: 4					
Symbolic links: None					
Special files: None					
Hard links: None, multilink files: None, saved: 0					
Zero data: None					
Dedupe estimate: N/A					
Total space for regular files: size: 0, used: 0					
Total space for symlinks: size: 0, used: 0					
Total space for directories: size: 20 KiB, used: 20 KiB					
Total space used: 20 KiB					
9 scanned, 4 summed, 3.61 KiB in (4.49 KiB/s), 740 out (920/s), 0s.					

scan -bs<n[k]>

Read/write block size for scans that read data with -md5 or -edupe (default: 64k).

```
[root@localhost /]# ./xcp scan -bs 32
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
```

```
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (3.64 KiB/s), 740 out (747/s), 0s.
```

scan -parallel

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp
  scan -parallel 4 10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (7.57 KiB/s), 740 out (1.52 KiB/s), 0s.
```

scan -noid

Disables the creation of a default index (default: False).

```
[root@localhost /]# ./xcp scan -noId
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

keymgr
keymgr/csr/secureadmin.pem
keymgr/cert/secureadmin.pem
keymgr/key/secureadmin.pem
keymgr/root
keymgr/csr
keymgr/cert
keymgr/key
keymgr/root/cacert.pem
9 scanned, 3.61 KiB in (22.2 KiB/s), 740 out (4.45 KiB/s), 0s.
```

scan -subdir-names

Returns the names of top level sub-directories in a directory.

```
[root@localhost /]# ./xcp scan -subdir-names
10.63.5.56:/vol/ex_s01/etc/keymgr
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun
Mar 31 00:00:00 2019

Keymgr
```

```
8 scanned, 1.21 KiB in (4.84 KiB/s), 148 out (593/s), 0s.
```

scan -acl4

Process NFS4 ACLs.

```
[root@localhost]# ./xcp scan -acl4 10.63.5.56:/vol1
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon
Dec 31 00:00:00 2029

vol1
vol1/test/fl
vol1/test

3 scanned, 3 getacls, 3 v3perms, 1.59 KiB in (1.72 KiB/s), 696 out
(753/s), 0s.
```

copy

The copy command scans and copies the entire source directory structure to a destination NFSv3 export. The copy command requires having source and destination paths as variables. The scanned and copied files, throughput/speed, and elapsed time details are displayed at the end of the copy operation.

Notes:

- The run-time log file is stored under /opt/NetApp/xFiles/xcp/xcp.log. This path is configurable. Additional logging is stored in the catalog after each command is executed.
- If the source is a 7-Mode system, you can use Snapshot as a source. For example, 10.63.5.36:/vol/ex_s01/.snapshot/<snapshot name>

Syntax

```
[root@localhost /]# ./xcp copy <source NFS export path>
<destination NFS export path>
```

Example

```
[root@localhost /]# ./xcp copy 10.63.5.56:/vol/ex_s01/etc/http
10.63.5.78:/vol/vt01

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.28.33.581277
277 scanned, 276 copied, 277 indexed, 1.85 MiB in (2.13 MiB/s),
1.85 MiB out (2.13 MiB/s), 0s.
```

Parameters

- The following table provides a list of copy parameters and their description.

Feature	Description
copy -md5	Checksum the files (also save the checksums when indexing) (default: False).
copy -edupe	Include deduplication estimate in reports (see documentation for details).
copy -nonames	Do not look up user and group names for file listings or reports.
copy -bs <n[k]>	Read/write block size (default: 64k).
copy -dircount <n[k]>	Request size for reading directories (default: 64k).
copy -parallel <n>	Maximum concurrent batch processes (default: 7).
copy -match <filter>	Only process files and directories that match the filter
Copy -acl4	Process NFS4 ACLs

copy -md5

Checksum the files (also save the checksums when indexing) (default: False).

```
[root@localhost /]# ./xcp copy -md5
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.30.01.038287
277 scanned, 270 summed, 276 copied, 277 indexed, 1.86 MiB in
(5.79 MiB/s), 1.86 MiB out (5.80 MiB/s), 0s.
```

copy -edupe

Include deduplication estimate in reports.

```
[root@localhost /]# ./xcp copy -edupe
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.33.44.665410

== Maximum Values ==
      Size      Used      Depth      Namelen      Dirsize
    231 KiB    236 KiB         3         39        198

== Average Values ==
      Namelen      Size      Depth      Dirsize
```

18	6.17 KiB	2	39
----	----------	---	----

```

== Top Space Users ==
    20041
    2.06 MiB

== Top File Owners ==
    20041      root
    276        1

== Top File Extensions ==
    .html      .gif      .dtd
    267        2        1

== Number of files ==
    empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB      >100MiB
    81        144        43        2

== Space used ==
    empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB      >100MiB
           776 KiB      960 KiB      340 KiB

== Directory entries ==
    empty      1-10      10-100 100-1,000      1K-10K
>10K
           4        2        1

== Depth ==
    0-5      6-10      11-15      16-20      21-100
>100
    277

== Accessed ==
    >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
           81        189

== Modified ==
    >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
    189        81

== Changed ==
    >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
           270

Total count: 277

```

```
Directories: 7
Regular files: 270
Symbolic links: None
Special files: None
Hard links: None, multilink files: None, saved: 0
Zero data: None
Dedupe estimate (using 64 KiB blocks and excluding zero blocks):
0
Total space for regular files: size: 1.63 MiB, used: 2.03 MiB
Total space for symlinks: size: 0, used: 0
Total space for directories: size: 32 KiB, used: 32 KiB
Total space used: 2.06 MiB
277 scanned, 270 summed, 276 copied, 277 indexed, 1.86 MiB in
(1.92 MiB/s), 1.86 MiB out (1.92 MiB/s), 0s.
```

copy -nonames

Do not look up user and group names for file listings or reports.

```
[root@localhost /]# ./xcp copy -nonames
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.35.07.113811
277 scanned, 276 copied, 277 indexed, 1.86 MiB in (4.79 MiB/s),
1.86 MiB out (4.79 MiB/s), 0s.
```

copy -bs <n[k]>

Read/write block size (default: 64k).

```
[root@localhost /]# ./xcp copy -bs 32k
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.38.49.746595
277 scanned, 276 copied, 277 indexed, 1.86 MiB in (1.82 MiB/s),
1.86 MiB out (1.82 MiB/s), 1s.
```

copy -dircount <n[k]>

Request size for reading directories (default: 64k).

```
[root@localhost /]# ./xcp copy -dircount 32k
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
```



```
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

```
xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.39.58.785116
277 scanned, 276 copied, 277 indexed, 1.86 MiB in (1.72 MiB/s),
1.86 MiB out (1.72 MiB/s), 1s.
```

copy -parallel <n>

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp copy -parallel 4
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
```

```
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

```
xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.41.49.941471
277 scanned, 276 copied, 277 indexed, 1.86 MiB in (7.69 MiB/s),
1.86 MiB out (7.69 MiB/s), 0s.
```

copy -match <n>

Only process files and directories that match the filter.

```
[root@localhost /]# ./xcp copy -match bin
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
```

```
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

```
xcp: WARNING: No index name has been specified, creating one
with name: autaname_copy_2019-01-04_16.48.45.509814
277 scanned, 277 matched, 276 copied, 277 indexed, 1.86 MiB in
(2.35 MiB/s), 1.86 MiB out (2.35 MiB/s), 0s.
```

copy -acl4

Process NFS4 ACLs.

```
[root@localhost]# ./xcp copy -acl4 -newid id1 10.63.5.56:/vol1
10.63.5.56:/vol2
```

```
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to Xxx [NetApp Inc]
until Mon Dec 31 00:00:00 2029
```

```
3 scanned, 2 copied, 3 indexed, 3 getacls, 3 v3perms, 1 setacl,
14.7 KiB in (11.7 KiB/s), 61 KiB out (48.4 KiB/s), 1s.
```

sync

The sync command scans for changes and modifications performed on a source NFS directory using a catalog index tag name or the number of a previous copy operation. Source incremental changes are copied and applied to the target directory. The old catalog index numbers are replaced with a new one after the sync operation.

Note: During the sync operation, modified files and directories are copied again to the destination NFSv3 export.

Syntax

```
[root@localhost /]# ./xcp sync -id <catalog index name>
```

Example

```
[root@localhost /]# ./xcp sync -id autoname_copy_2019-01-04_16.48.45.509814
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:
10.63.5.78:/vol/vt01}

277 reviewed, 277 matched, 277 checked at source, no changes,
277 reindexed, 79.6 KiB in (74.0 KiB/s), 69.3 KiB out (64.4
KiB/s), 1s.
```

Parameters

The following table lists the sync parameters and their description.

Feature	Description
sync -id <name>	Catalog name of a previous copy index
sync -stats	Tree statistics report formats
sync -csv	Tree statistics report formats
sync -html	Tree statistics report formats
sync -nonames	Do not look up user and group names for file listings or reports
sync -bs <n[k]>	Read/write block size (default: 64k)
sync -dircount <n[k]>	Request size for reading directories (default: 64k)
sync -parallel <n>	Maximum concurrent batch processes (default: 7)
sync -snap <snapshot path>	Provide a new snapshot path for sync

sync -id and sync -stats

Tree statistics report formats.

```
[root@localhost /]# ./xcp sync -id 3 -stats

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}

xcp: new sync for id '3': WARNING: Catalog id 3-sync.1 already
exists but the index
'10.61.82.215:/vol/nfsvol/catalog/indexes/3/3-sync.1/3-
sync.1.index' is empty; removing and proceeding...
64 reviewed, 64 checked at source, 6 changes, 6 modifications,
51.1 KiB in (55.2 KiB/s), 21.8 KiB out (23.6 KiB/s), 0s.
xcp: sync '3': Starting search pass for 1 modified directory...
xcp: sync '3': Found 6 indexed files in the 1 changed directory
xcp: sync '3': Rereading the 1 modified directory to find what's
new...
xcp: sync '3': Deep scanning the 1 directory that changed...

Total count: 15
Directories: 2
Regular files: 13
Symbolic links: None
Special files: None
Hard links: None, multilink files: None, saved: 0
Zero data: None
Dedupe estimate: N/A
Total space for regular files: size: 2.26 KiB, used: 12 KiB
Total space for symlinks: size: 0, used: 0
Total space for directories: size: 8 KiB, used: 8 KiB
Total space used: 20 KiB

15 scanned, 15 copied, 15.3 KiB in (13.4 KiB/s), 11.8 KiB out
(10.3 KiB/s), 1s.
```

sync -id and sync -csv

Tree statistics report formats.

```
[root@localhost /]# ./xcp sync -id 3 -csv

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}

xcp: new sync for id '3': WARNING: Catalog id 3-sync.1 already
exists but the index
'10.61.82.215:/vol/nfsvol/catalog/indexes/3/3-sync.1/3-
sync.1.index' is empty; removing and proceeding...
```

```

64 reviewed, 64 checked at source, 6 changes, 6 modifications,
51.1 KiB in (42.0 KiB/s), 21.8 KiB out (17.9 KiB/s), 1s.
xcp: sync '3': Starting search pass for 1 modified directory...
xcp: sync '3': Found 6 indexed files in the 1 changed directory
xcp: sync '3': Rereading the 1 modified directory to find what's
new...
xcp: sync '3': Deep scanning the 1 directory that changed...
xcp,1.0-c4ccf9c
date,08-Jun-2015 03:31 AM EDT
sync 10.61.82.215:/vol/nfsvol
options,"{'-id': '3', '-csv': True}"
summary,"19 scanned, 19 copied, 17.8 KiB in (12.3 KiB/s), 13.7
KiB out (9.47 KiB/s), 1s."

19 scanned, 19 copied, 17.8 KiB in (12.3 KiB/s), 13.7 KiB out
(9.46 KiB/s), 1s.

```

sync -id and sync -html

Tree statistics report formats.

```

[root@localhost /]# ./xcp sync -id 3 -html

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}
Sending statistics...

+

23 scanned, 23 copied, 20.2 KiB in (16.1 KiB/s), 15.6 KiB out
(12.4 KiB/s), 1s.

```

sync -id and sync -nonames

Do not look up user and group names for file listings or reports.

```

[root@localhost /]# ./xcp sync -id 3 -nonames

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}

xcp: new sync for id '3': WARNING: Catalog id 3-sync.1 already
exists but the index
'10.61.82.215:/vol/nfsvol/catalog/indexes/3/3-sync.1/3-
sync.1.index' is empty; removing and proceeding...
64 reviewed, 64 checked at source, 6 changes, 6 modifications,
51.1 KiB in (94.2 KiB/s), 21.8 KiB out (40.2 KiB/s), 0s.
xcp: sync '3': Starting search pass for 1 modified directory...
xcp: sync '3': Found 6 indexed files in the 1 changed directory
xcp: sync '3': Rereading the 1 modified directory to find what's
new...
xcp: sync '3': Deep scanning the 1 directory that changed...

```

```
Sending statistics...
```

```
31 scanned, 31 copied, 25.2 KiB in (14.0 KiB/s), 19.4 KiB out  
(10.8 KiB/s), 1s.
```

sync -id and sync -bs

Read/write block size (default: 64k).

```
[root@localhost /]# ./xcp sync -id 3 -bs 32k

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}

xcp: new sync for id '3': WARNING: Catalog id 3-sync.1 already
exists but the index
'10.61.82.215:/vol/nfsvol/catalog/indexes/3/3-sync.1/3-
sync.1.index' is empty; removing and proceeding...
64 reviewed, 64 checked at source, 6 changes, 6 modifications,
51.1 KiB in (29.1 KiB/s), 21.8 KiB out (12.4 KiB/s), 1s.
xcp: sync '3': Starting search pass for 1 modified directory...
xcp: sync '3': Found 6 indexed files in the 1 changed directory
xcp: sync '3': Rereading the 1 modified directory to find what's
new...
xcp: sync '3': Deep scanning the 1 directory that changed...
Sending statistics...

39 scanned, 39 copied, 30.1 KiB in (14.9 KiB/s), 23.2 KiB out
(11.5 KiB/s), 2s.
```

sync -id and sync -dircount

Request size for reading directories (default: 64k).

```
[root@localhost /]# ./xcp sync -id 3 -dircount 32k

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}

xcp: new sync for id '3': WARNING: Catalog id 3-sync.1 already
exists but the index
'10.61.82.215:/vol/nfsvol/catalog/indexes/3/3-sync.1/3-
sync.1.index' is empty; removing and proceeding...
64 reviewed, 64 checked at source, 6 changes, 6 modifications,
51.1 KiB in (49.2 KiB/s), 21.8 KiB out (21.0 KiB/s), 1s.
xcp: sync '3': Starting search pass for 1 modified directory...
xcp: sync '3': Found 6 indexed files in the 1 changed directory
xcp: sync '3': Rereading the 1 modified directory to find what's
new...
xcp: sync '3': Deep scanning the 1 directory that changed...
Sending statistics...
```

```
43 scanned, 43 copied, 32.6 KiB in (13.9 KiB/s), 25.1 KiB out  
(10.7 KiB/s), 2s.
```

sync -id and sync -parallel

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp sync -id 3 -parallel 4  
  
Index: {source: '10.61.82.215:/vol/nfsvol', target:  
'10.61.73.115:/dest_nfs1'}  
  
xcp: new sync for id '3': WARNING: Catalog id 3-sync.1 already  
exists but the index  
'10.61.82.215:/vol/nfsvol/catalog/indexes/3/3-sync.1/3-  
sync.1.index' is empty; removing and proceeding...  
64 reviewed, 64 checked at source, 6 changes, 6 modifications,  
51.1 KiB in (81.3 KiB/s), 21.8 KiB out (34.7 KiB/s), 0s.  
xcp: sync '3': Starting search pass for 1 modified directory...  
xcp: sync '3': Found 6 indexed files in the 1 changed directory  
xcp: sync '3': Rereading the 1 modified directory to find what's  
new...  
xcp: sync '3': Deep scanning the 1 directory that changed...  
Sending statistics...  
  
47 scanned, 47 copied, 35 KiB in (18.8 KiB/s), 27.0 KiB out  
(14.5 KiB/s), 1s.
```

sync dry-run

The sync dry-run command looks for changes or modifications made to the source NFS directory using a previous catalog index number of copy operation. This command also detects files and directories that are new or moved, deleted, or renamed since the previous copy operation. The command reports the source changes but does not apply them to the target.

Syntax

```
[root@localhost /]# ./xcp sync dry-run -id <catalog index  
number>
```

Example

```
[root@localhost /]# ./xcp sync dry-run -id 2  
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]  
until Sun Mar 31 00:00:00 2019  
  
xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:  
None}  
  
277 reviewed, 277 checked at source, no changes, 59.6 KiB in  
(186 KiB/s), 35.7 KiB out (111 KiB/s), 0s.
```

Parameters

The following table lists the sync dry-run parameters and their description.

Feature	Description
sync dry-run -id <name>	Catalog name of a previous copy index
sync dry-run -stats	Deep scan the modified directories and report on everything that is new
sync dry-run -l	Print details about files and directories that changed
sync -nonames	Do not look up user and group names for file listings or reports
sync -dircount <n[k]>	Request size for reading directories (default: 64k)
sync -parallel <n>	Maximum concurrent batch processes (default: 7)

sync dry-run -id

Catalog name of a previous copy index.

```
[root@localhost /]# ./xcp sync dry-run -id 2
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:
None}

277 reviewed, 277 checked at source, no changes, 59.6 KiB in
(186 KiB/s), 35.7 KiB out (111 KiB/s), 0s.
```

sync dry-run -id and sync dry-run -stats

Deep scan the modified directories and report on everything that is new.

```
[root@localhost /]# ./xcp sync dry-run -id 3 -stats

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs1'}

64 reviewed, 64 checked at source, 6 changes, 6 modifications,
43.4 KiB in (9.81 KiB/s), 12.2 KiB out (2.75 KiB/s), 4s.
xcp: dry-run (dry run) '3': Starting search pass for 1 modified
directory...
xcp: dry-run (dry run) '3': Found 6 indexed files in the 1
changed directory
xcp: dry-run (dry run) '3': Rereading the 1 modified directory
to find what's new...
xcp: dry-run (dry run) '3': Deep scanning the 1 directory that
changed...
```

```
Total count: 47
Directories: 2
Regular files: 45
Symbolic links: None
Special files: None
Hard links: None, multilink files: None, saved: 0
Zero data: N/A
Dedupe estimate: N/A
Total space for regular files: size: 2.26 KiB, used: 12 KiB
Total space for symlinks: size: 0, used: 0
Total space for directories: size: 8 KiB, used: 8 KiB
Total space used: 20 KiB

47 scanned, 11.1 KiB in (2.47 KiB/s), 516 out (115/s), 4s.
```

sync dry-run -id and sync dry-run -l

Print details about files and directories that changed.

```
[root@localhost /]# ./xcp sync dry-run -id 2 -l
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:
None}

277 reviewed, 277 checked at source, no changes, 59.6 KiB in
(65.7 KiB/s), 35.7 KiB out (39.4 KiB/s), 0s.
```

sync dry-run -id and sync dry-run -nonames

Do not look up user and group names for file listings or reports.

```
[root@localhost /]# ./xcp sync dry-run -id 2 -nonames
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:
None}

277 reviewed, 277 checked at source, no changes, 59.6 KiB in
(85.1 KiB/s), 35.7 KiB out (51.0 KiB/s), 0s.
```

sync dry-run -id and sync dry-run -dircount

Request size for reading directories (default: 64k).

```
[root@localhost /]# ./xcp sync dry-run -id 2 -dircount 32k
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```



```
xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:
None}
```

```
277 reviewed, 277 checked at source, no changes, 59.6 KiB in
(69.7 KiB/s), 35.7 KiB out (41.8 KiB/s), 0s.
```

sync dry-run -id and sync dry-run -parallel

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp sync dry-run -id 2 -parallel 4
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

```
xcp: Index: {source: 10.63.5.56:/vol/ex_s01/etc/http, target:
None}
```

```
277 reviewed, 277 checked at source, no changes, 59.6 KiB in
(383 KiB/s), 35.7 KiB out (230 KiB/s), 0s.
```

resume

The resume command restarts a previously interrupted copy operation by specifying the catalog index name or number. The catalog index name or number of the previous copy operation is stored at the <catalog path>:/catalog/indexes directory.

Syntax

```
[root@localhost /]# ./xcp resume -id <catalog index number>
```

Example

```
[root@localhost /]# ./xcp resume -id 4
```

```
Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs7'}
```

```
xcp: resume '4': WARNING: Incomplete index.
```

```
xcp: resume '4': Found 18 completed directories and 1 in
progress
```

```
106 reviewed, 24.2 KiB in (30.3 KiB/s), 7.23 KiB out (9.06
KiB/s), 0s.
```

```
xcp: resume '4': Starting second pass for the in-progress
directory...
```

```
xcp: resume '4': Found 3 indexed directories and 0 indexed files
in the 1 in-progress directory
```

```
xcp: resume '4': In progress dirs: unindexed 1, indexed 0
```

```
xcp: resume '4': Resuming the 1 in-progress directory...
```

```
20 scanned, 7 copied, 205 MiB in (39.6 MiB/s), 205 MiB out
(39.6 MiB/s), 5s
```

```
20 scanned, 14 copied, 425 MiB in (42.1 MiB/s), 423 MiB out
(41.8 MiB/s), 11s
```

```

20 scanned, 14 copied, 540 MiB in (23.0 MiB/s), 538 MiB out
(23.0 MiB/s), 16s
20 scanned, 14 copied, 721 MiB in (35.6 MiB/s), 720 MiB out
(35.6 MiB/s), 21s
20 scanned, 15 copied, 835 MiB in (22.7 MiB/s), 833 MiB out
(22.7 MiB/s), 26s
20 scanned, 16 copied, 1007 MiB in (34.3 MiB/s), 1005 MiB out
(34.3 MiB/s), 31s
20 scanned, 17 copied, 1.15 GiB in (33.9 MiB/s), 1.15 GiB out
(33.9 MiB/s), 36s
20 scanned, 17 copied, 1.27 GiB in (25.5 MiB/s), 1.27 GiB out
(25.5 MiB/s), 41s
20 scanned, 17 copied, 1.45 GiB in (36.1 MiB/s), 1.45 GiB out
(36.1 MiB/s), 46s
20 scanned, 17 copied, 1.69 GiB in (48.7 MiB/s), 1.69 GiB out
(48.7 MiB/s), 51s
Sending statistics...

20 scanned, 20 copied, 21 indexed, 1.77 GiB in (33.5 MiB/s),
1.77 GiB out (33.4 MiB/s), 54s.

```

Parameters

The following table lists the resume parameters and their description.

Feature	Description
resume -id <name>	Catalog name of a previous copy index
resume -bs <n[k]>	Read/write block size (default: 64k)
resume -dircount <n[k]>	Request size for reading directories (default: 64k)
resume -parallel <n>	Maximum concurrent batch processes (default: 7)
resume -activate	Activate a license on the current host

resume -id<name> and resume -bs

Read/write block size (default: 64k).

```

[root@localhost /]# ./xcp resume -id 5 -bs 32k

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs8'}

xcp: resume '5': WARNING: Incomplete index.
xcp: resume '5': Found 20 completed directories and 1 in
progress
117 reviewed, 24.2 KiB in (25.4 KiB/s), 7.23 KiB out (7.59
KiB/s), 0s.
xcp: resume '5': Starting second pass for the in-progress
directory...

```

```
xcp: resume '5': Found 3 indexed directories and 0 indexed files
in the 1 in-progress directory
xcp: resume '5': In progress dirs: unindexed 1, indexed 0
xcp: resume '5': Resuming the 1 in-progress directory...
 20 scanned, 9 copied, 247 MiB in (47.8 MiB/s), 247 MiB out
(47.8 MiB/s), 6s
 20 scanned, 14 copied, 547 MiB in (60.1 MiB/s), 546 MiB out
(59.8 MiB/s), 11s
 20 scanned, 14 copied, 760 MiB in (42.4 MiB/s), 758 MiB out
(42.4 MiB/s), 16s
 20 scanned, 15 copied, 890 MiB in (24.4 MiB/s), 889 MiB out
(24.4 MiB/s), 21s
 20 scanned, 17 copied, 1.05 GiB in (34.6 MiB/s), 1.04 GiB out
(34.6 MiB/s), 26s
 20 scanned, 17 copied, 1.31 GiB in (54.2 MiB/s), 1.31 GiB out
(54.3 MiB/s), 31s
 20 scanned, 17 copied, 1.60 GiB in (59.5 MiB/s), 1.60 GiB out
(59.6 MiB/s), 36s
Sending statistics...

20 scanned, 20 copied, 21 indexed, 1.78 GiB in (45.4 MiB/s),
1.78 GiB out (45.4 MiB/s), 40s
```

resume -id and resume -dircount

Request size for reading directories (default: 64k).

```
[root@localhost /]# ./xcp resume -id 6 -dircount 32k

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs9'}

xcp: resume '6': WARNING: Incomplete index.
xcp: resume '6': Found 22 completed directories and 1 in
progress
128 reviewed, 24.2 KiB in (17.8 KiB/s), 7.23 KiB out (5.33
KiB/s), 1s.
xcp: resume '6': Starting second pass for the in-progress
directory...
xcp: resume '6': Found 3 indexed directories and 0 indexed files
in the 1 in-progress directory
xcp: resume '6': In progress dirs: unindexed 1, indexed 0
xcp: resume '6': Resuming the 1 in-progress directory...
 20 scanned, 3 copied, 58.1 MiB in (10.6 MiB/s), 58.1 MiB out
(10.6 MiB/s), 6s
 20 scanned, 7 copied, 159 MiB in (17.9 MiB/s), 159 MiB out
(17.9 MiB/s), 12s
 20 scanned, 14 copied, 349 MiB in (34.7 MiB/s), 347 MiB out
(34.3 MiB/s), 17s
 20 scanned, 14 copied, 424 MiB in (13.0 MiB/s), 422 MiB out
(13.0 MiB/s), 23s
```

```

20 scanned, 14 copied, 526 MiB in (19.2 MiB/s), 524 MiB out
(19.2 MiB/s), 28s
20 scanned, 14 copied, 636 MiB in (20.2 MiB/s), 634 MiB out
(20.2 MiB/s), 34s
20 scanned, 14 copied, 722 MiB in (16.7 MiB/s), 720 MiB out
(16.7 MiB/s), 39s
20 scanned, 15 copied, 787 MiB in (13.0 MiB/s), 786 MiB out
(13.0 MiB/s), 44s
20 scanned, 15 copied, 883 MiB in (17.9 MiB/s), 882 MiB out
(17.9 MiB/s), 49s
20 scanned, 16 copied, 975 MiB in (17.7 MiB/s), 973 MiB out
(17.7 MiB/s), 55s
20 scanned, 16 copied, 1.01 GiB in (11.2 MiB/s), 1.01 GiB out
(11.2 MiB/s), 1m0s
20 scanned, 17 copied, 1.16 GiB in (27.8 MiB/s), 1.16 GiB out
(27.8 MiB/s), 1m5s
20 scanned, 17 copied, 1.23 GiB in (13.2 MiB/s), 1.23 GiB out
(13.2 MiB/s), 1m11s
20 scanned, 17 copied, 1.30 GiB in (14.1 MiB/s), 1.30 GiB out
(14.1 MiB/s), 1m16s
20 scanned, 17 copied, 1.42 GiB in (22.3 MiB/s), 1.42 GiB out
(22.3 MiB/s), 1m22s
20 scanned, 17 copied, 1.48 GiB in (12.4 MiB/s), 1.48 GiB out
(12.4 MiB/s), 1m27s
20 scanned, 17 copied, 1.67 GiB in (33.2 MiB/s), 1.67 GiB out
(33.2 MiB/s), 1m33s
Sending statistics...

20 scanned, 20 copied, 21 indexed, 1.77 GiB in (18.8 MiB/s),
1.77 GiB out (18.8 MiB/s), 1m36s.

```

resume -id and resume -parallel

Maximum concurrent batch processes (default: 7).

```

[root@localhost /]# ./xcp resume -id 7 -parallel 3

Index: {source: '10.61.82.215:/vol/nfsvol', target:
'10.61.73.115:/dest_nfs9'}

xcp: resume '7': WARNING: Incomplete index.
xcp: resume '7': Found 24 completed directories and 1 in
progress
139 reviewed, 32.2 KiB in (23.8 KiB/s), 7.23 KiB out (5.34
KiB/s), 1s.
xcp: resume '7': Starting second pass for the in-progress
directory...
xcp: resume '7': Found 3 indexed directories and 0 indexed files
in the 1 in-progress directory
xcp: resume '7': In progress dirs: unindexed 1, indexed 0
xcp: resume '7': Resuming the 1 in-progress directory...

```

```
20 scanned, 3 copied, 83.0 MiB in (14.4 MiB/s), 83.0 MiB out
(14.4 MiB/s), 6s
20 scanned, 7 copied, 169 MiB in (15.5 MiB/s), 169 MiB out
(15.5 MiB/s), 12s
20 scanned, 7 copied, 207 MiB in (6.60 MiB/s), 207 MiB out
(6.60 MiB/s), 18s
20 scanned, 13 copied, 308 MiB in (19.3 MiB/s), 307 MiB out
(19.0 MiB/s), 23s
20 scanned, 14 copied, 363 MiB in (10.5 MiB/s), 362 MiB out
(10.3 MiB/s), 28s
20 scanned, 14 copied, 501 MiB in (26.1 MiB/s), 499 MiB out
(26.1 MiB/s), 34s
20 scanned, 14 copied, 663 MiB in (27.6 MiB/s), 661 MiB out
(27.6 MiB/s), 39s
20 scanned, 15 copied, 820 MiB in (26.7 MiB/s), 818 MiB out
(26.7 MiB/s), 45s
20 scanned, 16 copied, 963 MiB in (28.5 MiB/s), 961 MiB out
(28.5 MiB/s), 50s
20 scanned, 16 copied, 1.01 GiB in (13.7 MiB/s), 1.01 GiB out
(13.7 MiB/s), 56s
20 scanned, 17 copied, 1.06 GiB in (8.96 MiB/s), 1.06 GiB out
(8.96 MiB/s), 1m1s
20 scanned, 17 copied, 1.23 GiB in (30.8 MiB/s), 1.23 GiB out
(30.9 MiB/s), 1m7s
20 scanned, 17 copied, 1.41 GiB in (32.3 MiB/s), 1.41 GiB out
(32.4 MiB/s), 1m13s
20 scanned, 17 copied, 1.55 GiB in (24.8 MiB/s), 1.54 GiB out
(24.8 MiB/s), 1m18s
20 scanned, 17 copied, 1.64 GiB in (16.7 MiB/s), 1.64 GiB out
(16.8 MiB/s), 1m24s
20 scanned, 19 copied, 1.76 GiB in (21.3 MiB/s), 1.76 GiB out
(21.3 MiB/s), 1m30s
Sending statistics...

20 scanned, 20 copied, 21 indexed, 1.77 GiB in (20.0 MiB/s),
1.77 GiB out (20.0 MiB/s), 1m30s.
```

verify

The `verify` command uses a full byte-by-byte data comparison between source and target directories after the copy operation without using a catalog index number. The command checks for modification times and other file or directory attributes including permissions. The command also reads the files on both sides and compares the data.

Note: The `verify` command is useful when source and target directory trees are identical. However, if a source directory is moved or renamed, `verify` will not find any files under that directory even though they are still in the target tree.

Syntax

```
[root@localhost /]# ./xcp verify <source NFS export path>  
<destination NFS export path>
```

Example

```
[root@localhost]# ./xcp verify 10.63.5.56:/vol/ex_s01/etc/http  
10.63.5.78:/vol/vt01  
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]  
until Sun Mar 31 00:00:00 2019  
  
xcp: WARNING: No index name has been specified, creating one  
with name: autaname_verify_2019-01-09_09.19.19.990837  
277 scanned, 277 indexed, 100% found (189 have data), 189  
compared, 100% verified (data, attrs, mods), 3.43 MiB in (12.1  
MiB/s), 163 KiB out (576 KiB/s), 0s.
```

The following table lists the verify parameters and their description.

Feature	Description
verify -stats	Scan source and target trees in parallel and compare tree statistics.
verify -csv	Scan source and target trees in parallel and compare tree statistics.
verify -nodata	Do not check data.
verify -noattrs	Do not check attributes.
verify -nomods	Do not check file modification times.
verify -mtimewindow <s>	Acceptable modification time difference for verification.
verify -v	Output formats to list any differences found.
verify -l	Output formats to list any differences found.
verify -nonames	Do not look up user and group names for file listings or reports.
verify -match <filter>	Only process files and directories that match the filter.
verify -bs <n[k]>	Read/write blocksize (default: 64k).
verify -parallel <n>	Maximum concurrent batch processes (default: 7).
verify -dircount <n[k]>	Request size for reading directories (default: 64k).
verify -newdata <id name>	Verify full structure, names, and attributes plus new data from the last sync
verify -nold	Disable the creation of a default index (default: False)
Verify -acl4	Process NFS4 ACLs

verify -stats

Scan source and target trees in parallel and compare tree statistics.

```

[root@localhost]# ./xcp verify -stats
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

== Number of files ==
      empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB      >100MiB
      81          144          43          2
      +175      +3,231      +979      +62      +29
+12

== Directory entries ==
      empty      1-10      10-100 100-1,000      1K-10K
>10K
      4          2          1
      +14      +869      +83      +4

== Depth ==
      0-5      6-10      11-15      16-20      21-100
>100
      277
      +2,160      +3,873

== Modified ==
      >1 year  >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
      189      81
      +3,735      +752      +1

Total count: 277 / +6,033
Directories: 7 / +970
Regular files: 270 / +4,488
Symbolic links: None / +354
Special files: None / same
Hard links: None / +221, Multilink files: None / +140

6,587 scanned, 1.46 MiB in (1.42 MiB/s), 146 KiB out (142
KiB/s), 1s.

```

verify -csv

Scan source and target trees in parallel and compare tree statistics.

```

[root@localhost]# ./xcp verify -csv
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

== Number of files ==

```

```

empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB     >100MiB
      81      144      43      2
      +175     +3,231      +979      +62      +29
+12

== Directory entries ==
empty      1-10      10-100 100-1,000      1K-10K
>10K
      4      2      1
      +14     +869      +83      +4

== Depth ==
0-5      6-10      11-15      16-20      21-100
>100
      277
      +2,160     +3,873

== Modified ==
>1 year   >1 month 1-31 days 1-24 hrs <1 hour <15
mins      future
      189      81
      +3,735     +752      +1

Total count: 277 / +6,033
Directories: 7 / +970
Regular files: 270 / +4,488
Symbolic links: None / +354
Special files: None / same
Hard links: None / +221, Multilink files: None / +140

6,587 scanned, 1.46 MiB in (4.57 MiB/s), 146 KiB out (457
KiB/s), 0s.

```

verify -stats and verify -csv

Scan source and target trees in parallel and compare tree statistics.

```

[root@localhost /]# ./xcp verify -stats -csv
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

== Number of files ==
empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-
100MiB     >100MiB
      81      144      43      2
      +175     +3,231      +979      +62      +29
+12

== Directory entries ==

```


	empty	1-10	10-100	100-1,000	1K-10K	>10K
		4	2	1		
	+14	+869	+83	+4		

== Depth ==

	0-5	6-10	11-15	16-20	21-100
>100					
	277				
	+2,160	+3,873			

== Modified ==

	>1 year	>1 month	1-31 days	1-24 hrs	<1 hour	<15 mins
	future					
	189	81				
	+3,735	+752	+1			

Total count: 277 / +6,033
 Directories: 7 / +970
 Regular files: 270 / +4,488
 Symbolic links: None / +354
 Special files: None / same
 Hard links: None / +221, Multilink files: None / +140

6,587 scanned, 1.46 MiB in (1.51 MiB/s), 146 KiB out (151 KiB/s), 0s.

verify -nodata

Do not check data.

```
[root@localhost]# ./xcp verify -nodata
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_09.36.21.071956
277 scanned, 277 indexed, 100% found (189 have data), 100%
verified (attrs, mods), 127 KiB in (393 KiB/s), 112 KiB out (346
KiB/s), 0s.
```

verify -noattrs

Do not check attributes.

```
[root@localhost]# ./xcp verify -noattrs
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

```
xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_09.41.02.966589
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, mods), 3.43 MiB in (13.3 MiB/s),
164 KiB out (635 KiB/s), 0s.
```

verify -nomods

Do not check file modification times.

```
[root@localhost]# ./xcp verify -nomods
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_09.42.34.290858
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs), 3.43 MiB in (5.94 MiB/s),
163 KiB out (283 KiB/s), 0s.
```

verify -mtimewindow <s>

Acceptable modification time difference for verification.

```
[root@localhost]# ./xcp verify -mtimewindow 2
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-10_16.19.11.250605
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (6.18
MiB/s), 164 KiB out (295 KiB/s), 0s.
```

verify -v

Output formats to list any differences found.

```
[root@localhost linux]# ./xcp verify -v
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.18.56.300188
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (5.80
MiB/s), 163 KiB out (277 KiB/s), 0s.
```

verify -l

Output formats to list any differences found.

```
[root@localhost]# ./xcp verify -l
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.19.52.500015
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (4.21
MiB/s), 163 KiB out (201 KiB/s), 0s.
```

verify -v and verify -l

Output formats to list any differences found.

```
[root@localhost]# ./xcp verify -v -l
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.20.49.087706
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (8.65
MiB/s), 164 KiB out (413 KiB/s), 0s.
```

verify -nonames

Do not look up user and group names for file listings or reports.

```
[root@localhost]# ./xcp verify -nonames
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.21.52.450685
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (4.62
MiB/s), 163 KiB out (220 KiB/s), 0s.
```

verify -match <filter>

Only process files and directories that match the filter.

```
[root@localhost]# ./xcp verify -match bin
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019
```

```
xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.22.44.899649
277 scanned, 277 matched, 277 indexed, 100% found (189 have
data), 189 compared, 100% verified (data, attrs, mods), 3.43 MiB
in (17.6 MiB/s), 164 KiB out (838 KiB/s), 0s.
```

verify -bs <n[k]>

Read/write block size (default: 64k).

```
[root@localhost]# ./xcp verify -bs 32k
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.23.32.564397
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (3.99
MiB/s), 167 KiB out (194 KiB/s), 0s.
```

verify -dircount <n[k]>

Request size for reading directories (default: 64k).

```
[root@localhost]# ./xcp verify -dircount 32k
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.24.30.471993
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (4.45
MiB/s), 164 KiB out (212 KiB/s), 0s.
```

verify -parallel <n>

Maximum concurrent batch processes (default: 7).

```
[root@localhost]# ./xcp verify -parallel 2
10.63.5.56:/vol/ex_s01/etc/http 10.63.5.78:/vol/vt01
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: WARNING: No index name has been specified, creating one
with name: autaname_verify_2019-01-09_10.25.47.018718
277 scanned, 277 indexed, 100% found (189 have data), 189
compared, 100% verified (data, attrs, mods), 3.43 MiB in (10.4
MiB/s), 164 KiB out (497 KiB/s), 0s.
```

verify -acl4

Process NFS4 ACLs .

```
[root@localhost]# ./xcp verify -acl4 -noid 10.63.5.56:/vol1
10.63.5.56:/vol2
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc]
until Mon Dec 31 00:00:00 2029

3 scanned, 100% found (0 have data), 100% verified (data, attrs,
mods, acls), 6 getacls, 6 v3perms, 2.90 KiB in (4.16 KiB/s),
2.94 KiB out (4.22 KiB/s), 0s.
```

delete

The **delete** command deletes everything in a given path.

Syntax

```
[root@localhost /]# ./xcp delete <NFS export path>
```

Example

```
[root@localhost]# ./xcp delete 10.63.5.56:/vol2
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xyz [NetApp Inc]
until Mon Dec 31 00:00:00 2029

WARNING: You have selected 10.63.5.56:/vol1 for removing data.
Entire data in this path /vol1 will be deleted.
Are you sure you want to delete (yes/no): yes
Recursively removing everything in 10.63.5.56:/vol1 ...

3 scanned, 1 remove, 1 rmdir, 2.74 KiB in (833/s), 2.00 KiB out
(607/s), 3s.
```

XCP NFS Use Cases

This section provides the most common XCP NFS migration use cases.

How to Transition 7-Mode NFSv3 Storage to ONTAP

This section covers the step-by-step procedure for transitioning a source 7-Mode NFSv3 export to an ONTAP system.

Note: NetApp assumes that the source 7-Mode NFSv3 volume is exported and mounted on the client system and that XCP is already installed on a Linux system.

Task Table 2) Transitioning 7-Mode NFSv3 export to ONTAP.

✓	Step	Description
	1.	Verify that the target ONTAP system is healthy.
		CLUSTER::> cluster show

✓	Step	Description
		<div>Node Health Eligibility</div> <div>-----</div> <div>CLUSTER-01 true true</div> <div>CLUSTER-02 true true</div> <div>2 entries were displayed.</div> <div>CLUSTER::> node show</div> <div>Node Health Eligibility Uptime Model Owner Location</div> <div>-----</div> <div>CLUSTER-01</div> <div>true true 78 days 21:01 FAS8060 RTP</div> <div>CLUSTER-02</div> <div>true true 78 days 20:50 FAS8060 RTP</div> <div>2 entries were displayed.</div> <div>CLUSTER::> storage failover show</div> <div>Takeover</div> <div>Node Partner Possible State Description</div> <div>-----</div> <div>CLUSTER-01 CLUSTER-02 true Connected to CLUSTER-02</div> <div>CLUSTER-02 CLUSTER-01 true Connected to CLUSTER-01</div> <div>2 entries were displayed.</div>
	2.	<div>Verify that at least one non-root aggregate exists on the target system. The aggregate is normal.</div> <div>CLUSTER::> storage aggregate show</div> <div>Aggregate Size Available Used% State #Vols Nodes RAID Status</div> <div>-----</div> <div>aggr0 368.4GB 17.85GB 95% online 1 CLUSTER-01 raid_dp,</div> <div>normal</div> <div>aggr0_CLUSTER_02_0</div> <div>368.4GB 17.85GB 95% online 1 CLUSTER-02 raid_dp,</div> <div>normal</div> <div>source 1.23TB 1.10TB 11% online 6 CLUSTER-01 raid_dp,</div> <div>normal</div> <div>3 entries were displayed.</div> <div>Note: If there is no data aggregate, create a new one using the storage aggr create command.</div>
	3.	<div>Create an SVM on the target cluster system.</div> <div>CLUSTER::> vserver create -vserver dest -rootvolume dest_root -aggregate poc -rootvolume-security-style mixed</div> <div>[Job 647] Job succeeded:</div>

✓	Step	Description
		<p>Vserver creation completed</p> <p>Verify the security style and language settings of the source</p>
		Verify the SVM was created
		<p>CLUSTER::> vserver show -vserver dest</p> <p>Vserver: dest</p> <p>Vserver Type: data</p> <p>Vserver Subtype: default</p> <p>Vserver UUID: 91f6d786-0063-11e5-b114-00a09853a969</p> <p>Root Volume: dest_root</p> <p>Aggregate: poc</p> <p>NIS Domain: -</p> <p>Root Volume Security Style: mixed</p> <p>LDAP Client: -</p> <p>Default Volume Language Code: C.UTF-8</p> <p>Snapshot Policy: default</p> <p>Comment:</p> <p>Quota Policy: default</p> <p>List of Aggregates Assigned: -</p> <p>Limit on Maximum Number of Volumes allowed: unlimited</p> <p>Vserver Admin State: running</p> <p>Vserver Operational State: running</p> <p>Vserver Operational State Stopped Reason: -</p> <p>Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp</p> <p>Disallowed Protocols: -</p> <p>Is Vserver with Infinite Volume: false</p> <p>QoS Policy Group: -</p> <p>Config Lock: false</p> <p>IPspace Name: Default</p>
	4.	<p>Remove the fcp, iscsi, ndmp, and cifs protocols from the target SVM.</p> <p>CLUSTER::> vserver remove-protocols -vserver dest -protocols fcp,iscsi,ndmp,cifs</p>
		Verify nfs is the allowed protocol for this SVM
		<p>CLUSTER::> vserver show -vserver dest -fields allowed-protocols</p> <p>vserver allowed-protocols</p> <p>-----</p> <p>dest nfs</p>

✓	Step	Description
	5.	<p>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</p> <pre>CLUSTER::> vol create -vserver dest -volume dest_nfs -aggregate poc -size 150g -type RW -state online -security-style mixed [Job 648] Job succeeded: Successful</pre>
	6.	<p>Create a data LIF to serve NFS client requests.</p> <pre>CLUSTER::> network interface create -vserver dest -lif dest_lif -address 10.61.73.115 -netmask 255.255.255.0 -role data -data-protocol nfs -home-node CLUSTER-01 -home-port e0i</pre> <p>Verify the LIF is successfully created.</p> <pre>CLUSTER::> network interface show -vserver dest Logical Status Network Current Current Is Vserver Interface Admin/Oper Address/Mask Node Port Home ----- dest dest_lif up/up 10.61.73.113/24 CLUSTER-01 e0i true</pre>
	7.	<p>Create a static route with the SVM if required</p> <pre>CLUSTER::> network route create -vserver dest -destination 0.0.0.0/0 -gateway 192.168.100.111</pre> <p>Verify the route is created</p> <pre>CLUSTER::> network route show -vserver source Vserver Destination Gateway Metric ----- dest 0.0.0.0/0 10.61.73.1 20</pre>
	8.	<p>Mount the target NFS data volume in the SVM namespace.</p> <pre>CLUSTER::> volume mount -vserver dest -volume dest_nfs -junction-path /dest_nfs -active true</pre> <p>Verify the volume is successfully mounted</p> <pre>CLUSTER::> volume show -vserver dest -fields junction-path vserver volume junction-path ----- dest dest_nfs /dest_nfs dest dest_root</pre>

✓	Step	Description						
		<p>/</p> <p>2 entries were displayed.</p> <p>Note: You can also specify volume mount options (junction path) with the volume create command.</p>						
	9.	<p>Start the NFS service on the target SVM.</p> <p>CLUSTER::> vserver nfs start -vserver dest</p> <p>Verify the service is started and running</p> <p>CLUSTER::> vserver nfs status</p> <p>The NFS server is running on Vserver "dest".</p> <p>CLUSTER::> nfs show</p> <p>Vserver: dest</p> <p>General Access: true</p> <p>v3: enabled</p> <p>v4.0: disabled</p> <p>4.1: disabled</p> <p>UDP: enabled</p> <p>TCP: enabled</p> <p>Default Windows User: -</p> <p>Default Windows Group: -</p>						
	10.	<p>Check that the default NFS export policy is applied to the target SVM.</p> <p>CLUSTER::> vserver export-policy show -vserver dest</p> <table><thead><tr><th>Vserver</th><th>Policy Name</th></tr></thead><tbody><tr><td>dest</td><td>default</td></tr></tbody></table>	Vserver	Policy Name	dest	default		
Vserver	Policy Name							
dest	default							
	11.	<p>If required, create a new custom export policy for the target SVM.</p> <p>CLUSTER::> vserver export-policy create -vserver dest -policyname xcpexportpolicy</p> <p>Verify the new custom export-policy is created</p> <p>CLUSTER::> vserver export-policy show -vserver dest</p> <table><thead><tr><th>Vserver</th><th>Policy Name</th></tr></thead><tbody><tr><td>dest</td><td>default</td></tr><tr><td>dest</td><td>xcpexportpolicy</td></tr></tbody></table> <p>2 entries were displayed.</p>	Vserver	Policy Name	dest	default	dest	xcpexportpolicy
Vserver	Policy Name							
dest	default							
dest	xcpexportpolicy							

✓	Step	Description																					
	12.	<p>Modify the export policy rules to allow access to NFS client(s).</p> <pre>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</pre> <p>Verify the policy rules have modified</p> <pre>CLUSTER::> export-policy rule show -instance</pre> <pre> Vserver: dest Policy Name: xcpexportpolicy Rule Index: 1 Access Protocol: nfs3 Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0 RO Access Rule: none RW Access Rule: none User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: none Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true</pre>																					
	13.	<p>Verify that the client is allowed access to the volume.</p> <pre>CLUSTER::> export-policy check-access -vserver dest -volume dest_nfs -client-ip 10.61.82.215 -authentication-method none -protocol nfs3 -access-type read-write</pre> <table><thead><tr><th>Path</th><th>Policy</th><th>Policy Owner</th><th>Rule Owner</th><th>Type</th><th>Index</th><th>Access</th></tr></thead><tbody><tr><td>/</td><td>xcpexportpolicy</td><td>dest_root</td><td>volume</td><td>1</td><td>read</td><td></td></tr><tr><td>/dest_nfs</td><td>xcpexportpolicy</td><td>dest_nfs</td><td>volume</td><td>1</td><td>read-write</td><td></td></tr></tbody></table> <p>2 entries were displayed.</p>	Path	Policy	Policy Owner	Rule Owner	Type	Index	Access	/	xcpexportpolicy	dest_root	volume	1	read		/dest_nfs	xcpexportpolicy	dest_nfs	volume	1	read-write	
Path	Policy	Policy Owner	Rule Owner	Type	Index	Access																	
/	xcpexportpolicy	dest_root	volume	1	read																		
/dest_nfs	xcpexportpolicy	dest_nfs	volume	1	read-write																		
	14.	<p>Connect to the Linux NFS server. Create a mount point for the NFS exported volume.</p> <pre>[root@localhost /]# cd /mnt [root@localhost mnt]# mkdir dest</pre>																					
	15.	<p>Mount the target NFSv3 exported volume at this mount point.</p> <p>Note: The NFSv3 volumes should be exported but not necessarily be mounted by the NFS server. The XCP Linux host client mounts these volumes if they can be mounted.</p> <pre>[root@localhost mnt]# mount -t nfs 10.61.73.115:/dest_nfs /mnt/dest</pre> <p>Verify the mount point is successfully created.</p>																					

✓	Step	Description
		<pre>[root@localhost /]# mount grep nfs 10.61.73.115:/dest_nfs on /mnt/dest type nfs (rw,relatime,vers=3,rsize=65536,wsiz=65536,namlen=255,hard,proto=tcp,timeo =600,retrans=2,sec=sys,mountaddr=10.61.82.215,mountvers=3,mountport=4046, mountproto=udp,local_lock=none,addr=10.61.73.115)</pre>
	16.	<p>Create a test file on the NFS exported mount point to enable read-write access.</p> <pre>[root@localhost dest]# touch test.txt</pre> <p>Verify the file is created</p> <pre>[root@localhost dest]# ls -l total 0 -rw-r--r-- 1 root bin 0 Jun 2 03:16 test.txt</pre> <p>Note: Once the read-write test is complete, delete the file from the target NFS mount point.</p>
	17.	<p>Connect to the Linux client system in which XCP is installed. Browse to the XCP install path.</p> <pre>[root@localhost ~]# cd /linux/ [root@localhost linux]#</pre>
	18.	<p>Query the source 7-Mode NFSv3 exports by running the xcp show command on the XCP Linux client host system.</p> <pre>[root@localhost]# ./xcp show 10.61.82.215</pre> <pre>== NFS Exports == Mounts Errors Server 4 0 10.61.82.215 Space Files Space Files Free Free Used Used Export 23.7 GiB 778,134 356 KiB 96 10.61.82.215:/vol/nfsvol1 17.5 GiB 622,463 1.46 GiB 117 10.61.82.215:/vol/nfsvol 328 GiB 10.8M 2.86 GiB 7,904 10.61.82.215:/vol/vol0/home 328 GiB 10.8M 2.86 GiB 7,904 10.61.82.215:/vol/vol0 == Attributes of NFS Exports == drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol1 drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol drwxrwxrwx --t root wheel 4KiB 4KiB 9d22h 10.61.82.215:/vol/vol0/home drwxr-xr-x --- root wheel 4KiB 4KiB 4d0h 10.61.82.215:/vol/vol0 3.89 KiB in (5.70 KiB/s), 7.96 KiB out (11.7 KiB/s), 0s.</pre>

✓	Step	Description
	19.	<p>Scan the source NFSv3 exported paths and print the statistics of their file structure.</p> <p>Note: NetApp recommends putting the source NFSv3 exports in read-only mode during xcp scan, copy, and sync operations.</p> <pre>[root@localhost /]# ./xcp scan 10.61.82.215:/vol/nfsvol</pre> <p>nfsvol</p> <p>nfsvol/n5000-uk9.5.2.1.N1.1.bin nfsvol/821_q_image.tgz nfsvol/822RC2_q_image.tgz nfsvol/NX5010_12_node_RCF_v1.3.txt nfsvol/n5000-uk9-kickstart.5.2.1.N1.1.bin nfsvol/NetApp_CN1610_1.1.0.5.stk nfsvol/glibc-common-2.7-2.x86_64.rpm nfsvol/glibc-2.7-2.x86_64.rpm nfsvol/rhel-server-5.6-x86_64-dvd.iso.filepart nfsvol/xcp nfsvol/xcp_source nfsvol/catalog</p> <p>23 scanned, 7.79 KiB in (5.52 KiB/s), 1.51 KiB out (1.07 KiB/s), 1s.</p>
	20.	<p>Copy source 7-Mode NFSv3 exports to NFSv3 exports on the target ONTAP system.</p> <pre>[root@localhost /]# ./xcp copy 10.61.82.215:/vol/nfsvol 10.61.73.115:/dest_nfs</pre> <p>44 scanned, 39 copied, 264 MiB in (51.9 MiB/s), 262 MiB out (51.5 MiB/s), 5s 44 scanned, 39 copied, 481 MiB in (43.3 MiB/s), 479 MiB out (43.4 MiB/s), 10s 44 scanned, 40 copied, 748 MiB in (51.2 MiB/s), 747 MiB out (51.3 MiB/s), 16s 44 scanned, 40 copied, 1.00 GiB in (55.9 MiB/s), 1.00 GiB out (55.9 MiB/s), 21s 44 scanned, 40 copied, 1.21 GiB in (42.8 MiB/s), 1.21 GiB out (42.8 MiB/s), 26s Sending statistics... 44 scanned, 43 copied, 1.46 GiB in (47.6 MiB/s), 1.45 GiB out (47.6 MiB/s), 31s.</p>
	21.	<p>After copy is finished, verify that source and destination NFSv3 exports have identical data. Run the xcp verify command.</p> <pre>[root@localhost /]# ./xcp verify 10.61.82.215:/vol/nfsvol 10.61.73.115:/dest_nfs</pre> <p>44 scanned, 44 found, 28 compared, 27 same data, 2.41 GiB in (98.4 MiB/s), 6.25 MiB out (255 KiB/s), 26s 44 scanned, 44 found, 30 compared, 29 same data, 2.88 GiB in (96.4 MiB/s), 7.46 MiB out (249 KiB/s), 31s</p>

✓	Step	Description
		<p>44 scanned, 100% found (43 have data), 43 compared, 100% verified (data, attrs, mods), 2.90 GiB in (92.6 MiB/s), 7.53 MiB out (240 KiB/s), 32s.</p> <p>Note: If verify finds differences between source and destination data, then the error no such file or directory is reported in the summary. To fix that issue, run the xcp sync command to copy the source changes to the destination.</p>
	22.	<p>Before and during the cutover, run verify again. If the source has new or updated data, then perform incremental updates. Run the xcp sync command.</p> <p>Note: For this operation, the previous copy index name or number is required.</p> <pre>[root@localhost /]# ./xcp sync -id 3</pre> <p>Index: {source: '10.61.82.215:/vol/nfsvol', target: '10.61.73.115:/dest_nfs1'}</p> <p>64 reviewed, 64 checked at source, 6 changes, 6 modifications, 51.7 KiB in (62.5 KiB/s), 22.7 KiB out (27.5 KiB/s), 0s.</p> <p>xcp: sync '3': Starting search pass for 1 modified directory...</p> <p>xcp: sync '3': Found 6 indexed files in the 1 changed directory</p> <p>xcp: sync '3': Rereading the 1 modified directory to find what's new...</p> <p>xcp: sync '3': Deep scanning the 1 directory that changed...</p> <p>Note: 11 scanned, 11 copied, 12.6 KiB in (6.19 KiB/s), 9.50 KiB out (4.66 KiB/s), 2s.</p>
	23.	<p>To resume a previously interrupted copy operation, run the xcp resume command.</p> <pre>[root@localhost /]# ./xcp resume -id 4</pre> <p>Index: {source: '10.61.82.215:/vol/nfsvol', target: '10.61.73.115:/dest_nfs7'}</p> <p>xcp: resume '4': WARNING: Incomplete index.</p> <p>xcp: resume '4': Found 18 completed directories and 1 in progress</p> <p>106 reviewed, 24.2 KiB in (30.3 KiB/s), 7.23 KiB out (9.06 KiB/s), 0s.</p> <p>xcp: resume '4': Starting second pass for the in-progress directory...</p> <p>xcp: resume '4': Found 3 indexed directories and 0 indexed files in the 1 in-progress directory</p> <p>xcp: resume '4': In progress dirs: unindexed 1, indexed 0</p> <p>xcp: resume '4': Resuming the 1 in-progress directory...</p> <p>20 scanned, 7 copied, 205 MiB in (39.6 MiB/s), 205 MiB out (39.6 MiB/s), 5s</p> <p>20 scanned, 14 copied, 425 MiB in (42.1 MiB/s), 423 MiB out (41.8 MiB/s), 11s</p> <p>20 scanned, 14 copied, 540 MiB in (23.0 MiB/s), 538 MiB out (23.0 MiB/s), 16s</p> <p>20 scanned, 14 copied, 721 MiB in (35.6 MiB/s), 720 MiB out (35.6 MiB/s), 21s</p> <p>20 scanned, 15 copied, 835 MiB in (22.7 MiB/s), 833 MiB out (22.7 MiB/s), 26s</p> <p>20 scanned, 16 copied, 1007 MiB in (34.3 MiB/s), 1005 MiB out (34.3 MiB/s), 31s</p> <p>20 scanned, 17 copied, 1.15 GiB in (33.9 MiB/s), 1.15 GiB out (33.9 MiB/s), 36s</p> <p>20 scanned, 17 copied, 1.27 GiB in (25.5 MiB/s), 1.27 GiB out (25.5 MiB/s), 41s</p>

✓	Step	Description
		<p>20 scanned, 17 copied, 1.45 GiB in (36.1 MiB/s), 1.45 GiB out (36.1 MiB/s), 46s 20 scanned, 17 copied, 1.69 GiB in (48.7 MiB/s), 1.69 GiB out (48.7 MiB/s), 51s Sending statistics...</p> <p>20 scanned, 20 copied, 21 indexed, 1.77 GiB in (33.5 MiB/s), 1.77 GiB out (33.4 MiB/s), 54s.</p> <p>After resume finishes copying files, run verify again so that the source and destination storage have identical data.</p>
	24	The NFSv3 client host needs to unmount the source NFSv3 exports provisioned from the 7-Mode storage and mounts the target NFSv3 exports from clustered Data ONTAP. Cutover requires an outage.

How to Transition 7-Mode Volume Snapshot Copies to ONTAP

This section covers the step-by-step procedure for transitioning a source 7-Mode volume Snapshot copy to ONTAP.

Note: NetApp assumes that the source 7-Mode volume is exported and mounted on the client system and that XCP is already installed on a Linux system. A Snapshot copy is a point-in-time image of a volume that records incremental changes since the last Snapshot copy. Use the “-snap” option with a 7Mode system as the source.

Warning:

Keep the base Snapshot copy. Do not delete the base Snapshot copy after the baseline copy is complete. The base Snapshot copy is required for further sync operations.

Task Table 3) Transitioning a source 7-Mode volume Snapshot copy to ONTAP.

✓	Step	Description
	1.	<p>Verify that the target ONTAP system is healthy.</p> <pre>CLUSTER::> cluster show Node Health Eligibility ----- CLUSTER-01 true true CLUSTER-02 true true 2 entries were displayed.</pre> <pre>CLUSTER::> node show Node Health Eligibility Uptime Model Owner Location ----- CLUSTER-01 true true 78 days 21:01 FAS8060 RTP CLUSTER-02 true true 78 days 20:50 FAS8060 RTP</pre>

✓	Step	Description																																								
		<p>2 entries were displayed.</p> <p>CLUSTER::> storage failover show</p> <p>Takeover</p> <table><tr><th>Node</th><th>Partner</th><th>Possible State</th><th>Description</th></tr><tr><td colspan="4">-----</td></tr><tr><td>CLUSTER-01</td><td>CLUSTER-02</td><td>true</td><td>Connected to CLUSTER-02</td></tr><tr><td>CLUSTER-02</td><td>CLUSTER-01</td><td>true</td><td>Connected to CLUSTER-01</td></tr></table> <p>2 entries were displayed.</p>	Node	Partner	Possible State	Description	-----				CLUSTER-01	CLUSTER-02	true	Connected to CLUSTER-02	CLUSTER-02	CLUSTER-01	true	Connected to CLUSTER-01																								
Node	Partner	Possible State	Description																																							

CLUSTER-01	CLUSTER-02	true	Connected to CLUSTER-02																																							
CLUSTER-02	CLUSTER-01	true	Connected to CLUSTER-01																																							
	2.	<p>Verify that at least one non-root aggregate exists on the target system. The aggregate is normal.</p> <p>CLUSTER::> storage aggregate show</p> <table><tr><th>Aggregate</th><th>Size</th><th>Available</th><th>Used%</th><th>State</th><th>#Vols</th><th>Nodes</th><th>RAID Status</th></tr><tr><td colspan="8">-----</td></tr><tr><td>aggr0</td><td>368.4GB</td><td>17.85GB</td><td>95%</td><td>online</td><td>1</td><td>CLUSTER-01</td><td>raid_dp, normal</td></tr><tr><td>aggr0_CLUSTER_02_0</td><td>368.4GB</td><td>17.85GB</td><td>95%</td><td>online</td><td>1</td><td>CLUSTER-02</td><td>raid_dp, normal</td></tr><tr><td>source</td><td>1.23TB</td><td>1.10TB</td><td>11%</td><td>online</td><td>6</td><td>CLUSTER-01</td><td>raid_dp, normal</td></tr></table> <p>3 entries were displayed.</p> <p>Note: If there is no data aggregate, create a new one using the storage aggr create command.</p>	Aggregate	Size	Available	Used%	State	#Vols	Nodes	RAID Status	-----								aggr0	368.4GB	17.85GB	95%	online	1	CLUSTER-01	raid_dp, normal	aggr0_CLUSTER_02_0	368.4GB	17.85GB	95%	online	1	CLUSTER-02	raid_dp, normal	source	1.23TB	1.10TB	11%	online	6	CLUSTER-01	raid_dp, normal
Aggregate	Size	Available	Used%	State	#Vols	Nodes	RAID Status																																			

aggr0	368.4GB	17.85GB	95%	online	1	CLUSTER-01	raid_dp, normal																																			
aggr0_CLUSTER_02_0	368.4GB	17.85GB	95%	online	1	CLUSTER-02	raid_dp, normal																																			
source	1.23TB	1.10TB	11%	online	6	CLUSTER-01	raid_dp, normal																																			
	3.	<p>Create an SVM on the target cluster system.</p> <p>CLUSTER::> vserver create -vserver dest -rootvolume dest_root -aggregate poc -rootvolume-security-style mixed</p> <p>[Job 647] Job succeeded:</p> <p>Vserver creation completed</p> <p>Verify the security style and language settings of the source</p> <p>Verify the SVM was created</p> <p>CLUSTER::> vserver show -vserver dest</p> <p>Vserver: dest</p> <p>Vserver Type: data</p> <p>Vserver Subtype: default</p> <p>Vserver UUID: 91f6d786-0063-11e5-b114-00a09853a969</p> <p>Root Volume: dest_root</p> <p>Aggregate: poc</p>																																								

✓	Step	Description					
		<p>NIS Domain: -</p> <p>Root Volume Security Style: mixed</p> <p>LDAP Client: -</p> <p>Default Volume Language Code: C.UTF-8</p> <p>Snapshot Policy: default</p> <p>Comment:</p> <p>Quota Policy: default</p> <p>List of Aggregates Assigned: -</p> <p>Limit on Maximum Number of Volumes allowed: unlimited</p> <p>Vserver Admin State: running</p> <p>Vserver Operational State: running</p> <p>Vserver Operational State Stopped Reason: -</p> <p>Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp</p> <p>Disallowed Protocols: -</p> <p>Is Vserver with Infinite Volume: false</p> <p>QoS Policy Group: -</p> <p>Config Lock: false</p> <p>IPspace Name: Default</p>					
	4.	<p>Remove the fcp, iscsi, ndmp, and cifs protocols from the target SVM.</p> <pre>CLUSTER::> vserver remove-protocols -vserver dest -protocols fcp,iscsi,ndmp,cifs</pre> <p>Verify NFS is the allowed protocol for this SVM</p> <pre>CLUSTER::> vserver show -vserver dest -fields allowed-protocols vserver allowed-protocols ----- dest nfs</pre>					
	5.	<p>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</p> <pre>CLUSTER::> vol create -vserver dest -volume dest_nfs -aggregate poc -size 150g - type RW -state online -security-style mixed [Job 648] Job succeeded: Successful</pre>					
	6.	<p>Create a data LIF to serve NFS client requests.</p> <pre>CLUSTER::> network interface create -vserver dest -lif dest_lif -address 10.61.73.115 -netmask 255.255.255.0 -role data -data-protocol nfs -home-node CLUSTER-01 -home-port e0l</pre> <p>Verify the LIF is successfully created.</p> <pre>CLUSTER::> network interface show -vserver dest</pre> <table><tr><td>Logical</td><td>Status</td><td>Network</td><td>Current</td><td>Current Is</td></tr></table>	Logical	Status	Network	Current	Current Is
Logical	Status	Network	Current	Current Is			

✓	Step	Description
		<pre> Vserver Interface Admin/Oper Address/Mask Node Port Home ----- dest dest_lif up/up 10.61.73.113/24 CLUSTER-01 e0i true </pre>
	7.	<p>Create a static route with the SVM if required</p> <pre> CLUSTER::> network route create -vserver dest -destination 0.0.0.0/0 -gateway 192.168.100.111 </pre> <p>Verify the route is created</p> <pre> CLUSTER::> network route show -vserver source Vserver Destination Gateway Metric ----- dest 0.0.0.0/0 10.61.73.1 20 </pre>
	8.	<p>Mount the target NFS data volume in the SVM namespace.</p> <pre> CLUSTER::> volume mount -vserver dest -volume dest_nfs -junction-path /dest_nfs -active true </pre> <p>Verify the volume is successfully mounted</p> <pre> CLUSTER::> volume show -vserver dest -fields junction-path vserver volume junction-path ----- dest dest_nfs /dest_nfs dest dest_root / 2 entries were displayed. </pre> <p>Note: You can also specify volume mount options (junction path) with the volume create command.</p>
	9.	<p>Start the NFS service on the target SVM.</p> <pre> CLUSTER::> vserver nfs start -vserver dest </pre> <p>Verify the service is started and running</p> <pre> CLUSTER::> vserver nfs status The NFS server is running on Vserver "dest". CLUSTER::> nfs show Vserver: dest </pre>

✓	Step	Description
		General Access: true v3: enabled v4.0: disabled 4.1: disabled UDP: enabled TCP: enabled Default Windows User: - Default Windows Group: -
	10.	Check that the default NFS export policy is applied to the target SVM. CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default
	11.	If required, create a new custom export policy for the target SVM. CLUSTER::> vserver export-policy create -vserver dest -policyname xcpexportpolicy Verify the new custom export-policy is created CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default dest xcpexportpolicy 2 entries were displayed.
	12.	Modify the export policy rules to allow access to NFS client(s) on the target system. CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0 Verify the policy rules have modified CLUSTER::> export-policy rule show -instance Vserver: dest Policy Name: xcpexportpolicy Rule Index: 1 Access Protocol: nfs3 Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0 RO Access Rule: none RW Access Rule: none User ID To Which Anonymous Users Are Mapped: 65534

✓	Step	Description																
		Superuser Security Types: none Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true																
	13.	Verify that the client has access to the target volume. CLUSTER::> export-policy check-access -vserver dest -volume dest_nfs -client-ip 10.61.82.215 -authentication-method none -protocol nfs3 -access-type read-write <table><thead><tr><th></th><th>Policy</th><th>Policy</th><th>Rule</th></tr><tr><th>Path</th><th>Policy</th><th>Owner</th><th>Owner Type Index Access</th></tr></thead><tbody><tr><td>/</td><td>xcpexportpolicy</td><td>dest_root</td><td>volume 1 read</td></tr><tr><td>/dest_nfs</td><td>xcpexportpolicy</td><td>dest_nfs</td><td>volume 1 read-write</td></tr></tbody></table> 2 entries were displayed.		Policy	Policy	Rule	Path	Policy	Owner	Owner Type Index Access	/	xcpexportpolicy	dest_root	volume 1 read	/dest_nfs	xcpexportpolicy	dest_nfs	volume 1 read-write
	Policy	Policy	Rule															
Path	Policy	Owner	Owner Type Index Access															
/	xcpexportpolicy	dest_root	volume 1 read															
/dest_nfs	xcpexportpolicy	dest_nfs	volume 1 read-write															
	14.	Connect to the Linux NFS server. Create a mount point for the NFS exported volume. [root@localhost /]# cd /mnt [root@localhost mnt]# mkdir dest																
	15.	Mount the target NFSv3 exported volume at this mount point. Note: The NFSv3 volumes should be exported but not necessarily be mounted by the NFS server. The XCP Linux host client mounts these volumes if they can be mounted. [root@localhost mnt]# mount -t nfs 10.61.73.115:/dest_nfs /mnt/dest Verify the mount point is successfully created. [root@localhost /]# mount grep nfs 10.61.73.115:/dest_nfs on /mnt/dest type nfs																
	16.	Create a test file on the NFS exported mount point to enable read-write access. [root@localhost dest]# touch test.txt Verify the file is created [root@localhost dest]# ls -l total 0 -rw-r--r-- 1 root bin 0 Jun 2 03:16 test.txt Note: Once the read-write test is complete, delete the file from the target NFS mount point.																
	17.	Connect to the Linux client system in which XCP is installed. Browse to the XCP install path.																

✓	Step	Description																																				
		<pre>[root@localhost ~]# cd /linux/ [root@localhost linux]#</pre>																																				
	18.	<p>Query the source 7-Mode NFSv3 exports by running the xcp show command on the XCP Linux client host system.</p> <pre>[root@localhost]#./xcp show 10.61.82.215</pre> <p>== NFS Exports ==</p> <table><thead><tr><th>Mounts</th><th>Errors</th><th>Server</th></tr></thead><tbody><tr><td>4</td><td>0</td><td>10.61.82.215</td></tr></tbody></table> <table><thead><tr><th>Space</th><th>Files</th><th>Space</th><th>Files</th><th></th></tr><tr><th>Free</th><th>Free</th><th>Used</th><th>Used</th><th>Export</th></tr></thead><tbody><tr><td>23.7 GiB</td><td>778,134</td><td>356 KiB</td><td>96</td><td>10.61.82.215:/vol/nfsvol1</td></tr><tr><td>17.5 GiB</td><td>622,463</td><td>1.46 GiB</td><td>117</td><td>10.61.82.215:/vol/nfsvol</td></tr><tr><td>328 GiB</td><td>10.8M</td><td>2.86 GiB</td><td>7,904</td><td>10.61.82.215:/vol/vol0/home</td></tr><tr><td>328 GiB</td><td>10.8M</td><td>2.86 GiB</td><td>7,904</td><td>10.61.82.215:/vol/vol0</td></tr></tbody></table> <p>== Attributes of NFS Exports ==</p> <pre>drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol1 drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol drwxrwxrwx --t root wheel 4KiB 4KiB 9d22h 10.61.82.215:/vol/vol0/home drwxr-xr-x --- root wheel 4KiB 4KiB 4d0h 10.61.82.215:/vol/vol0</pre> <p>3.89 KiB in (5.70 KiB/s), 7.96 KiB out (11.7 KiB/s), 0s.</p>	Mounts	Errors	Server	4	0	10.61.82.215	Space	Files	Space	Files		Free	Free	Used	Used	Export	23.7 GiB	778,134	356 KiB	96	10.61.82.215:/vol/nfsvol1	17.5 GiB	622,463	1.46 GiB	117	10.61.82.215:/vol/nfsvol	328 GiB	10.8M	2.86 GiB	7,904	10.61.82.215:/vol/vol0/home	328 GiB	10.8M	2.86 GiB	7,904	10.61.82.215:/vol/vol0
Mounts	Errors	Server																																				
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328 GiB	10.8M	2.86 GiB	7,904	10.61.82.215:/vol/vol0																																		
	19.	<p>Scan the source NFSv3 exported paths and print the statistics of their file structure.</p> <p>Note: NetApp recommends putting the source NFSv3 exports in read-only mode during xcp scan, copy, and sync operations. In sync operations it is mandatory to pass the -snap option with a corresponding value.</p> <pre>[root@localhost /]# ./xcp scan 10.61.82.215:/vol/nfsvol/.snapshot/snap1</pre> <p>nfsvol</p> <p>nfsvol/n5000-uk9.5.2.1.N1.1.bin nfsvol/821_q_image.tgz nfsvol/822RC2_q_image.tgz nfsvol/NX5010_12_node_RCF_v1.3.txt nfsvol/n5000-uk9-kickstart.5.2.1.N1.1.bin nfsvol/catalog</p> <p>23 scanned, 7.79 KiB in (5.52 KiB/s), 1.51 KiB out (1.07 KiB/s), 1s.</p>																																				

✓	Step	Description
		<pre>[root@scspr1202780001 vol_acl4]# ./xcp sync -id 7msnap1 -snap 10.236.66.199:/vol/nfsvol/.snapshot/snap10</pre> <p>(show scan and sync)</p>
	20.	<p>Copy source 7-Mode NFSv3 snapshot (base) to NFSv3 exports on the target ONTAP system.</p> <pre>[root@localhost /]# ./xcp copy 10.61.82.215:/vol/nfsvol/.snapshot/snap1 10.61.73.115:/dest_nfs</pre> <p>44 scanned, 39 copied, 264 MiB in (51.9 MiB/s), 262 MiB out (51.5 MiB/s), 5s 44 scanned, 39 copied, 481 MiB in (43.3 MiB/s), 479 MiB out (43.4 MiB/s), 10s 44 scanned, 40 copied, 748 MiB in (51.2 MiB/s), 747 MiB out (51.3 MiB/s), 16s 44 scanned, 40 copied, 1.00 GiB in (55.9 MiB/s), 1.00 GiB out (55.9 MiB/s), 21s 44 scanned, 40 copied, 1.21 GiB in (42.8 MiB/s), 1.21 GiB out (42.8 MiB/s), 26s Sending statistics... 44 scanned, 43 copied, 1.46 GiB in (47.6 MiB/s), 1.45 GiB out (47.6 MiB/s), 31s.</p> <p>Note: Keep this base snapshot for further sync operations.</p>
	21.	<p>After copy is complete, verify that source and destination NFSv3 exports have identical data. Run the xcp verify command.</p> <pre>[root@localhost /]# ./xcp verify 10.61.82.215:/vol/nfsvol 10.61.73.115:/dest_nfs</pre> <p>44 scanned, 44 found, 28 compared, 27 same data, 2.41 GiB in (98.4 MiB/s), 6.25 MiB out (255 KiB/s), 26s 44 scanned, 44 found, 30 compared, 29 same data, 2.88 GiB in (96.4 MiB/s), 7.46 MiB out (249 KiB/s), 31s 44 scanned, 100% found (43 have data), 43 compared, 100% verified (data, attrs, mods), 2.90 GiB in (92.6 MiB/s), 7.53 MiB out (240 KiB/s), 32s.</p> <p>Note: If verify finds differences between source and destination data, then the error no such file or directory is reported in the summary. To fix that issue, run the xcp sync command to copy the source changes to the destination.</p>
	22.	<p>Before and during the cutover, run verify again. If the source has new or updated data, then perform incremental updates. If there are incremental changes, create a new Snapshot copy for these changes and pass that snapshot path with the “-snap” option for sync operations.</p> <p>Run the xcp sync command with “-snap” option and snapshot path.</p> <pre>[root@localhost /]# ./xcp sync -id 3</pre> <p>Index: {source: '10.61.82.215:/vol/nfsvol/.snapshot/snap1', target: '10.61.73.115:/dest_nfs1'}</p> <p>64 reviewed, 64 checked at source, 6 changes, 6 modifications, 51.7 KiB in (62.5 KiB/s), 22.7 KiB out (27.5 KiB/s), 0s.</p>

✓	Step	Description
		xcp: sync '3': Starting search pass for 1 modified directory... xcp: sync '3': Found 6 indexed files in the 1 changed directory xcp: sync '3': Rereading the 1 modified directory to find what's new... xcp: sync '3': Deep scanning the 1 directory that changed... 11 scanned, 11 copied, 12.6 KiB in (6.19 KiB/s), 9.50 KiB out (4.66 KiB/s), 2s.. Note: For this operation, the base snapshot is required.
	23.	To resume a previously interrupted copy operation, run the xcp resume command. <pre>[root@scspr1202780001 534h_dest_vol]# ./xcp resume -id 3</pre> XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 xcp: Index: {source: '10.61.82.215:/vol/nfsvol',/.snapshot/snap1, target: 10.237.160.55:/dest_vol} xcp: resume '7msnap_res1': Reviewing the incomplete index... xcp: diff '7msnap_res1': Found 143 completed directories and 230 in progress 39,688 reviewed, 1.28 MiB in (1.84 MiB/s), 13.3 KiB out (19.1 KiB/s), 0s. xcp: resume '7msnap_res1': Starting second pass for the in-progress directories... xcp: resume '7msnap_res1': Resuming the in-progress directories... xcp: resume '7msnap_res1': Resumed command: copy {-newid: u'7msnap_res1'} xcp: resume '7msnap_res1': Current options: {-id: '7msnap_res1'} xcp: resume '7msnap_res1': Merged options: {-id: '7msnap_res1', -newid: u'7msnap_res1'} xcp: resume '7msnap_res1': Values marked with a * include operations before resume 68,848 scanned*, 54,651 copied*, 39,688 indexed*, 35.6 MiB in (7.04 MiB/s), 28.1 MiB out (5.57 MiB/s), 5s
	24	The NFSv3 client host needs to unmount the source NFSv3 exports provisioned from the 7-Mode storage and mounts the target NFSv3 exports from clustered Data ONTAP. Cutover requires an outage.

How to Migrate ACLv4 from NetApp 7-Mode to a NetApp Storage System

This section covers the step-by-step procedure for transitioning a source NFSv4 export to an ONTAP system.

Note: NetApp assumes that the source NFSv4 volume is exported and mounted on the client system and that XCP is already installed on a Linux system. The source should be a NetApp 7-Mode system that support ACLs. ACL migration is supported from NetApp to NetApp only.

Prerequisites for migrating a source NFSv4 export to ONTAP.

The destination system must have NFSv4 configured.

Mount the NFSv4 source and target on XCP host. Select NFS v4.0 to match the source and target storage and verify ACLs are enabled on the source and target system.

XCP requires the source/target path to be mounted on the XCP host for ACL Processing.

In the example below, "vol1(10.63.5.56:/vol1)" is mounted on the path "/mnt/vol1":

```
[root@localhost ~]# df -h
Filesystem
Size  Used Avail Use% Mounted on
10.63.5.56:/vol1
973M  4.2M  969M   1% /mnt/vol1

[root@localhost ~]# ./xcp scan -l -acl4 10.63.5.56:/vol1/
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

drwxr-xr-x --- root root 4KiB 4KiB 23h42m vol1
rw-r--r-- --- root root    4    0 23h42m vol1/DIR1/FILE
drwxr-xr-x --- root root 4KiB 4KiB 23h42m vol1/DIR1/DIR11
drwxr-xr-x --- root root 4KiB 4KiB 23h42m vol1/DIR1
rw-r--r-- --- root root    4    0 23h42m vol1/DIR1/DIR11/FILE
drwxr-xr-x --- root root 4KiB 4KiB 23h42m vol1/DIR1/DIR11/DIR2
rw-r--r-- --- root root    4    0 23h42m
vol1/DIR1/DIR11/DIR2/FILE
drwxr-xr-x --- root root 4KiB 4KiB 17m43s
vol1/DIR1/DIR11/DIR2/DIR22

8 scanned, 8 getacls, 1 v3perm, 7 acls, 3.80 KiB in (3.86
KiB/s), 1.21 KiB out (1.23 KiB/s), 0s.
```

There are two options for working with subdirectories:

1. For XCP to work on a subdirectory (/vol1/DIR1/DIR11), mount the complete path (10.63.5.56:/vol1/DIR1/DIR11) on the XCP host.

If the complete path is not mounted, XCP reports the following error:

```
[root@localhost ~]# ./xcp scan -l -acl4
10.63.5.56:/vol1/DIR1/DIR11
XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

xcp: ERROR: For xcp to process ACLs, please mount
10.63.5.56:/vol1/DIR1/DIR11 using the OS nfs4 client.
```

2. Use the subdirectory syntax (mount:subdirectory/qtree/.snapshot) as shown in the example below:

```
[root@localhost ~]# ./xcp scan -l -acl4
10.63.5.56:/vol1:/DIR1/DIR11
```

XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to XXX [NetApp Inc]
until Sun Mar 31 00:00:00 2019

```
drwxr-xr-x --- root root 4KiB 4KiB 23h51m DIR11
rw-r--r-- --- root root    4    0 23h51m DIR11/DIR2/FILE
drwxr-xr-x --- root root 4KiB 4KiB 26m9s DIR11/DIR2/DIR22
rw-r--r-- --- root root    4    0 23h51m DIR11/FILE
drwxr-xr-x --- root root 4KiB 4KiB 23h51m DIR11/DIR2
```

5 scanned, 5 getacls, 5 acls, 2.04 KiB in (3.22 KiB/s), 540 out
(850/s), 0s.

Task Table 4) Migrating ACLv4 from NetApp 7-Mode to a NetApp storage system.

✓	Step	Description
	1.	<p>Verify that the target ONTAP system is healthy.</p> <pre>CLUSTER::> cluster show Node Health Eligibility ----- CLUSTER-01 true true CLUSTER-02 true true 2 entries were displayed.</pre> <p>CLUSTER::> node show</p> <pre>Node Health Eligibility Uptime Model Owner Location ----- CLUSTER-01 true true 78 days 21:01 FAS8060 RTP CLUSTER-02 true true 78 days 20:50 FAS8060 RTP 2 entries were displayed.</pre> <p>CLUSTER::> storage failover show</p> <pre>Takeover Node Partner Possible State Description ----- CLUSTER-01 CLUSTER-02 true Connected to CLUSTER-02 CLUSTER-02 CLUSTER-01 true Connected to CLUSTER-01 2 entries were displayed.</pre>

✓	Step	Description
	2.	Verify that at least one non-root aggregate exists on the target system. The aggregate is normal.
		CLUSTER::> storage aggregate show
		Aggregate Size Available Used% State #Vols Nodes RAID Status -----
		aggr0 368.4GB 17.85GB 95% online 1 CLUSTER-01 raid_dp, normal
		aggr0_CLUSTER_02_0 368.4GB 17.85GB 95% online 1 CLUSTER-02 raid_dp, normal
		source 1.23TB 1.10TB 11% online 6 CLUSTER-01 raid_dp, normal
		3 entries were displayed.
		Note: If there is no data aggregate, create a new one using the storage aggr create command.
	3.	Create an SVM on the target cluster system.
		CLUSTER::> vserver create -vserver dest -rootvolume dest_root -aggregate poc -rootvolume-security-style mixed [Job 647] Job succeeded: Vserver creation completed Verify the security style and language settings of the source
		Verify the SVM was created
		CLUSTER::> vserver show -vserver dest
		Vserver: dest Vserver Type: data Vserver Subtype: default Vserver UUID: 91f6d786-0063-11e5-b114-00a09853a969 Root Volume: dest_root Aggregate: poc NIS Domain: - Root Volume Security Style: mixed LDAP Client: - Default Volume Language Code: C.UTF-8 Snapshot Policy: default Comment: Quota Policy: default List of Aggregates Assigned: - Limit on Maximum Number of Volumes allowed: unlimited

✓	Step	Description
		Vserver Admin State: running Vserver Operational State: running Vserver Operational State Stopped Reason: - Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp Disallowed Protocols: - Is Vserver with Infinite Volume: false QoS Policy Group: - Config Lock: false IPspace Name: Default
	4.	Remove the fcp, iscsi, ndmp, and cifs protocols from the target SVM. CLUSTER::> vserver remove-protocols -vserver dest -protocols fcp,iscsi,ndmp,cifs Verify nfs is the allowed protocol for this SVM CLUSTER::> vserver show -vserver dest -fields allowed-protocols vserver allowed-protocols ----- dest nfs
	5.	Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume. CLUSTER::> vol create -vserver dest -volume dest_nfs -aggregate poc -size 150g -type RW -state online -security-style mixed [Job 648] Job succeeded: Successful
	6.	Create a data LIF to serve NFS client requests. CLUSTER::> network interface create -vserver dest -lif dest_lif -address 10.61.73.115 -netmask 255.255.255.0 -role data -data-protocol nfs -home-node CLUSTER-01 -home-port e0i Verify the LIF is successfully created. CLUSTER::> network interface show -vserver dest Logical Status Network Current Current Is Vserver Interface Admin/Oper Address/Mask Node Port Home ----- dest dest_lif up/up 10.61.73.113/24 CLUSTER-01 e0i true
	7.	Create a static route with the SVM if required CLUSTER::> network route create -vserver dest -destination 0.0.0.0/0 -gateway 192.168.100.111

✓	Step	Description
		<p>Verify the route is created</p> <pre>CLUSTER::> network route show -vserver source Vserver Destination Gateway Metric ----- dest 0.0.0.0/0 10.61.73.1 20</pre>
	8.	<p>Mount the target NFS data volume in the SVM namespace.</p> <pre>CLUSTER::> volume mount -vserver dest -volume dest_nfs -junction-path /dest_nfs -active true</pre> <p>Verify the volume is successfully mounted</p> <pre>CLUSTER::> volume show -vserver dest -fields junction-path vserver volume junction-path ----- dest dest_nfs /dest_nfs dest dest_root / 2 entries were displayed.</pre> <p>Note: You can also specify volume mount options (junction path) with the volume create command.</p>
	9.	<p>Start the NFS service on the target SVM.</p> <pre>CLUSTER::> vserver nfs start -vserver dest</pre> <p>Verify the service is started and running</p> <pre>CLUSTER::> vserver nfs status The NFS server is running on Vserver "dest".</pre> <pre>CLUSTER::> nfs show</pre> <pre>Vserver: dest General Access: true v3: enabled v4.0: enabled 4.1: disabled UDP: enabled TCP: enabled Default Windows User: -</pre>

✓	Step	Description
		Default Windows Group: -
	10.	<p>Check that the default NFS export policy is applied to the target SVM.</p> <pre>CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default</pre>
	11.	<p>If required, create a new custom export policy for the target SVM.</p> <pre>CLUSTER::> vserver export-policy create -vserver dest -policyname xcpexportpolicy</pre> <p>Verify the new custom export-policy is created</p> <pre>CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default dest xcpexportpolicy 2 entries were displayed.</pre>
	12.	<p>Modify the export policy rules to allow access to NFS client(s).</p> <pre>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</pre> <p>Verify the policy rules have modified</p> <pre>CLUSTER::> export-policy rule show -instance</pre> <pre> Vserver: dest Policy Name: xcpexportpolicy Rule Index: 1 Access Protocol: nfs3 Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0 RO Access Rule: none RW Access Rule: none User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: none Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true</pre>
	13.	<p>Verify that the client is allowed access to the volume.</p> <pre>CLUSTER::> export-policy check-access -vserver dest -volume dest_nfs -client-ip 10.61.82.215 -authentication-method none -protocol nfs3 -access-type read- write</pre>

✓	Step	Description																																								
		<table><thead><tr><th>Path</th><th>Policy</th><th>Policy</th><th>Owner</th><th>Owner Type</th><th>Rule</th><th>Index</th><th>Access</th></tr></thead><tbody><tr><td>/</td><td></td><td>xcpexportpolicy</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>dest_root</td><td>volume</td><td></td><td>1</td><td>read</td></tr><tr><td>/dest_nfs</td><td></td><td>xcpexportpolicy</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>dest_nfs</td><td>volume</td><td></td><td>1</td><td>read-write</td></tr></tbody></table> <p>2 entries were displayed.</p>	Path	Policy	Policy	Owner	Owner Type	Rule	Index	Access	/		xcpexportpolicy									dest_root	volume		1	read	/dest_nfs		xcpexportpolicy									dest_nfs	volume		1	read-write
Path	Policy	Policy	Owner	Owner Type	Rule	Index	Access																																			
/		xcpexportpolicy																																								
			dest_root	volume		1	read																																			
/dest_nfs		xcpexportpolicy																																								
			dest_nfs	volume		1	read-write																																			
	14.	<p>Connect to the Linux NFS server. Create a mount point for the NFS exported volume.</p> <pre>[root@localhost /]# cd /mnt [root@localhost mnt]# mkdir dest</pre>																																								
	15.	<p>Mount the target NFSv4 exported volume at this mount point.</p> <p>Note: The NFSv4 volumes should be exported but not necessarily be mounted by the NFS server. The XCP Linux host client mounts these volumes if they can be mounted.</p> <pre>[root@localhost mnt]# mount -t nfs4 10.63.5.56:/vol1 /mnt/vol1</pre> <p>Verify the mount point is successfully created.</p> <pre>[root@localhost mnt]# mount grep nfs 10.63.5.56:/vol1 on /mnt/vol1 type nfs4 (rw,relatime,vers=4.0,rsz=65536,wsz=65536,namlen=255,hard,proto=tcp,time o=600, retrans=2,sec=sys,clientaddr=10.234.152.84,local_lock=none,addr=10.63.5.56)</pre>																																								
	16.	<p>Create a test file on the NFS exported mount point to enable read-write access.</p> <pre>[root@localhost dest]# touch test.txt</pre> <p>Verify the file is created</p> <pre>[root@localhost dest]# ls -l total 0 -rw-r--r-- 1 root bin 0 Jun 2 03:16 test.txt</pre> <p>Note: Once the read-write test is complete, delete the file from the target NFS mount point.</p>																																								
	17.	<p>Connect to the Linux client system in which XCP is installed. Browse to the XCP install path.</p> <pre>[root@localhost ~]# cd /linux/ [root@localhost linux]#</pre>																																								

✓	Step	Description
	18.	<p>Query the source NFSv4 exports by running the xcp show command on the XCP Linux client host system.</p> <pre> root@localhost]# ./xcp show 10.63.5.56 XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 getting pmap dump from 10.63.5.56 port 111... getting export list from 10.63.5.56... sending 6 mounts and 24 nfs requests to 10.63.5.56... == RPC Services == '10.63.5.56': UDP rpc services: MNT v1/2/3, NFS v3, NLM v4, PMAP v2/3/4, STATUS v1 '10.63.5.56': TCP rpc services: MNT v1/2/3, NFS v3/4, NLM v4, PMAP v2/3/4, STATUS v1 == NFS Exports == Mounts Errors Server 6 0 10.63.5.56 Space Files Space Files Free Free Used Used Export 94.7 MiB 19,883 324 KiB 107 10.63.5.56:/ 971 MiB 31,023 2.19 MiB 99 10.63.5.56:/vol2 970 MiB 31,024 2.83 MiB 98 10.63.5.56:/vol1 9.33 GiB 310,697 172 MiB 590 10.63.5.56:/vol_005 43.3 GiB 1.10M 4.17 GiB 1.00M 10.63.5.56:/vol3 36.4 GiB 1.10M 11.1 GiB 1.00M 10.63.5.56:/vol4 == Attributes of NFS Exports == drwxr-xr-x --- root root 4KiB 4KiB 6d2h 10.63.5.56:/ drwxr-xr-x --- root root 4KiB 4KiB 3d2h 10.63.5.56:/vol2 drwxr-xr-x --- root root 4KiB 4KiB 3d2h 10.63.5.56:/vol1 drwxr-xr-x --- root root 4KiB 4KiB 9d2h 10.63.5.56:/vol_005 drwxr-xr-x --- root root 4KiB 4KiB 9d4h 10.63.5.56:/vol3 drwxr-xr-x --- root root 4KiB 4KiB 9d4h 10.63.5.56:/vol4 6.09 KiB in (9.19 KiB/s), 12.2 KiB out (18.3 KiB/s), 0s. </pre>
	19.	<p>Scan the source NFSv4 exported paths and print the statistics of their file structure.</p> <p>Note: NetApp recommends putting the source NFSv4 exports in read-only mode during xcp scan, copy, and sync operations.</p> <pre> [root@localhost]# ./xcp scan -acl4 10.63.5.56:/vol1 </pre>

✓	Step	Description
		<p>XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>vol1 vol1/test/f1 vol1/test</p> <p>3 scanned, 3 getacls, 3 v3perms, 1.59 KiB in (1.72 KiB/s), 696 out (753/s), 0s.</p>
	20.	<p>Copy source NFSv4 exports to NFSv4 exports on the target ONTAP system.</p> <p>[root@localhost]# ./xcp copy -acl4 -newid id1 10.63.5.56:/vol1 10.63.5.56:/vol2</p> <p>XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>3 scanned, 2 copied, 3 indexed, 3 getacls, 3 v3perms, 1 setacl, 14.7 KiB in (11.7 KiB/s), 61 KiB out (48.4 KiB/s), 1s..</p>
	21.	<p>After copy is complete, verify that source and destination NFSv4 exports have identical data. Run the xcp verify command.</p> <p>[root@localhost]# ./xcp verify -acl4 -noid 10.63.5.56:/vol1 10.63.5.56:/vol2</p> <p>XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>3 scanned, 100% found (0 have data), 100% verified (data, attrs, mods, acls), 6 getacls, 6 v3perms, 2.90 KiB in (4.16 KiB/s), 2.94 KiB out (4.22 KiB/s), 0s.</p> <p>Note: If verify finds differences between source and destination data, then the error no such file or directory is reported in the summary. To fix that issue, run the xcp sync command to copy the source changes to the destination.</p>
	22.	<p>Before and during the cutover, run verify again. If the source has new or updated data, then perform incremental updates. Run the xcp sync command.</p> <p>[root@ root@localhost]# ./xcp sync -id id1</p> <p>XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>xcp: Index: {source: 10.63.5.56:/vol1, target: 10.63.5.56:/vol2}</p> <p>3 reviewed, 3 checked at source, no changes, 3 reindexed, 25.6 KiB in (32.3 KiB/s), 23.3 KiB out (29.5 KiB/s), 0s.</p> <p>Note: For this operation, the previous copy index name or number is required.</p>
	23.	<p>To resume a previously interrupted copy operation, run the xcp resume command.</p>

✓	Step	Description
		<pre>[root@localhost]# ./xcp resume -id id1</pre> <p>XCP 1.5; (c) 2019 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>xcp: Index: {source: 10.63.5.56:/vol3, target: 10.63.5.56:/vol4}</p> <p>xcp: resume 'id1': Reviewing the incomplete index...</p> <p>xcp: diff 'id1': Found 0 completed directories and 8 in progress 39,899 reviewed, 1.64 MiB in (1.03 MiB/s), 14.6 KiB out (9.23 KiB/s), 1s.</p> <p>xcp: resume 'id1': Starting second pass for the in-progress directories...</p> <p>xcp: resume 'id1': Resuming the in-progress directories...</p> <p>xcp: resume 'id1': Resumed command: copy {-acl4: True}</p> <p>xcp: resume 'id1': Current options: {-id: 'id1'}</p> <p>xcp: resume 'id1': Merged options: {-acl4: True, -id: 'id1'}</p> <p>xcp: resume 'id1': Values marked with a * include operations before resume 86,404 scanned, 39,912 copied, 39,899 indexed, 13.0 MiB in (2.60 MiB/s), 78.4 KiB out (15.6 KiB/s), 5s 86,404 scanned, 39,912 copied, 39,899 indexed, 13.0 MiB in (0/s), 78.4 KiB out (0/s), 10s 1.00M scanned, 100% found (1M have data), 1M compared, 100% verified (data, attrs, mods, acls), 2.00M getacls, 202 v3perms, 1.00M same acls, 2.56 GiB in (2.76 MiB/s), 485 MiB out (524 KiB/s), 15m48s.</p> <p>After resume finishes copying files, run verify again so that the source and destination storage have identical data.</p>

XCP SMB

XCP SMB uses Windows client host systems to generate parallel I/O streams and fully utilize available network and storage performance.

XCP SMB Storage

XCP SMB transitions and migrations have the following source and target storage requirements:

- XCP host system: The user must have administrator privilege (user must be part of "BUILTIN\Administrators" group on the XCP SMB host system).
- Target storage system: The user must have read and write access.
- Source storage system:
 - If the user is part of "Backup Operators" group in source storage system, the members of this group can read files while bypassing the security rules,

regardless of any permissions that protect those files.

- If the user is not part of "Backup Operators" group in source system, the user must have read access.
- The user needs to have "Manage auditing and security log" privilege enabled.

Note: Write permission is required in source storage system for supporting the XCP option "-preserve-atime".

XCP SMB Installation

This section details the procedure for VC++ redistributable installation and the initial setup of XCP on a Windows client.

Task Table 5) Microsoft VC++ redistributable installation.

Step	Action
1.	Go to https://go.microsoft.com/fwlink/?LinkId=746572 and download VC++ 2017 redistributable
2.	Double-click the installer to start the installation. Accept the terms and conditions and click Install.
3.	When the installation is complete, click Restart.

Task Table 6) XCP SMB initial setup procedure.

Step	Action
1.	Copy the XCP SMB binary on a Windows host.
2.	On the Windows client, extract the archive.
3.	After extracting the archive, change the working directory to the location where the XCP binary is placed: <C:\Users\administrator.domainname\Desktop\xcp>.
4.	Run the xcp activate command. An error message appears indicating that the license is not found and activated. [C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp activate (c) 2019 NetApp, Inc. License file C:\NetApp\XCP\license not found. Register for a license at https://xcp.netapp.com
5.	Copy the downloaded license file to the Windows host at C:\NetApp\XCP.

Step	Action
6.	Verify that the license file was copied at C:\NetApp\XCP
7.	<p>Run the xcp activate command to activate the XCP SMB license on the host.</p> <pre>C:\Users\Administrator\Desktop\xcp>xcp activate XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 XCP activated C:\Users\Administrator\Desktop\xcp></pre>
9.	<p>Verify that the license error has disappeared and XCP SMB is licensed.</p> <pre>C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp activate XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 XCP already activated C:\Users\administrator.RTP2K8DOM\Desktop\xcp></pre>

XCP SMB Command Reference

This section provides the list of available commands for XCP SMB. Each command has additional parameters and can be used alone or in combination as required.

Table 3) XCP SMB Command Reference.

Feature	Description
Core Engine Innovations	<p>Supports Windows, CLI only</p> <p>Extreme performance (~25x comparable tools)</p> <p>Multiple layers of granularity (qtrees, subdirectories, criteria-based filtering)</p> <p>Easy deployment (64-bit Windows host-based software)</p>
“help”	Displays information about XCP commands and options to be used.
“show”	Requests information from host about SMB shares.

"activate"	Activates XCP license on Windows host systems
"scan"	Reads all files and directories found on a SMB share.
"copy"	Recursively copies everything from source to destination.
"license"	Displays XCP license information.
"license update"	Retrieves the latest license from the XCP server
"sync"	Scans the source and target in parallel and updates the target with all the modifications from the source.
"verify"	Performs three levels of verification to make sure that the target is the same as the source. The command verifies statistics, structure, and full data bit by bit.

Note: The output of XCP SMB commands can be redirected using the ">" operator. For example:

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp --help > help-
output.txt
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

help

The help command displays a list of commands, command parameters, and a brief description of each. The command is very useful for beginners who are new to XCP.

Syntax

```
C:\Users\Administrator\Desktop\xcp>xcp --help
```

Example

```
C:\Users\Administrator\Desktop\xcp>xcp --help
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
usage: xcp [-h] [-version]
{scan,show,copy,sync,verify,license,activate,help} ...

optional arguments:
-h, --help      show this help message and exit
-version       show program's version number and exit
XCP commands:
{scan,show,copy,sync,verify,license,activate,help}
scan           Read all the files in a file tree
show           Request information from host about SMB shares
copy           Recursively copy everything from source to target
sync           Sync target with source
verify         Verify that the target is the same as the source
license        Show xcp license info
activate       Activate a license on the current host
help           Show help for commands
```

Parameters

The following table describes the help parameters.

Feature	Description
xcp help <command>	Displays examples and option details for the specified <command>.

help details

Display details, usage, arguments, and optional arguments.

```
C:\Users\Administrator\Desktop\xcp>xcp help sync
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
usage: xcp sync [-h] [-v] [-parallel <n>] [-match <filter>] [-
preserve-atime]
[-nodata] [-noatime] [-noctime] [-nomtime] [-noattrs]
[-noownership] [-atimewindow <float>] [-ctimewindow <float>]
[-mtimewindow <float>] [-acl] [-fallback-user FALLBACK_USER]
[-fallback-group FALLBACK_GROUP] [-l]

source target
Note: ONTAP does not let a SMB client modify COMPRESSED or
ENCRYPTED attributes.
XCP sync will ignore these file attributes.
positional arguments:
source
target
optional arguments:
-h, --help      show this help message and exit
```

```

-v                increase debug verbosity
-parallel <n>      number of concurrent processes (default:
<cpu-count>)
-match <filter>    only process files and directories that
match the filter
                  see `xcp help -match` for details)
-preserve-atype    restore last accessed date on source
-nodata           do not check data
-noatime           do not check file access time
-noctime           do not check file creation time
-nomtime           do not check file modification time
-noattrs           do not check attributes
-noownership       do not check ownership
-atimewindow <float> acceptable access time difference in
seconds
-ctimewindow <float> acceptable creation time difference in
seconds
-mtimewindow <float> acceptable modification time difference
in seconds
-acl               copy security information
-fallback-user FALLBACK_USER
                  a user on the target machine to receive the
permissions of local (nondomain) source machine users (eg.
domain\administrator)
-fallback-group    FALLBACK_GROUP
                  a group on the target machine to receive the
permissions of local
(non-domain) source machine groups (eg. domain\administrators)
-l                increase output
-root             sync acl for root directory
C:\Users\Administrator\Desktop\xcp>

```

show

The show command queries the RPC services and NFS exports of one or more storage servers. The command also lists the available services and exports with the used and free capacity of each export, followed by the attributes of the root of each export.

Syntax

The show command requires the host name or IP address of the NFSv3 exported system.

```

C:\Users\Administrator\Desktop\xcp>xcp show \\<IP address or
hostname of SMB server>

```

Example

```

C:\Users\Administrator\Desktop\xcp>xcp show \\10.61.87.235
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
Shares Errors Server
7 0 10.61.87.235

```

```

== SMB Shares ==
Space Space Current
Free Used Connections Share Path Folder Path
0 0 N/A \\10.61.87.235\IPC$ N/A
533GiB 4.72GiB 0 \\10.61.87.235\ETC$ C:\etc
533GiB 4.72GiB 0 \\10.61.87.235\HOME C:\vol\vol10\home
533GiB 4.72GiB 0 \\10.61.87.235\C$ C:\
972MiB 376KiB 0 \\10.61.87.235\testsecure C:\vol\testsecure
12 XCP SMB v1.5 User Guide © 2019 NetApp, Inc. All rights
reserved.
47.8GiB 167MiB 1 \\10.61.87.235\volxcp C:\vol\volxcp
9.50GiB 512KiB 1 \\10.61.87.235\j1 C:\vol\j1
== Attributes of SMB Shares ==
Share Types Remark
IPC$ PRINTQ,IPC,SPECIAL,DEVICE Remote IPC
ETC$ SPECIAL Remote Administration
HOME DISKTREE Default Share
C$ SPECIAL Remote Administration
testsecure DISKTREE for secure copy
volxcp DISKTREE for xcpSMB
j1 DISKTREE
== Permissions of SMB Shares ==
Share Entity Type
IPC$ Everyone Allow/Full Control
ETC$ Administrators Allow/Full Control
HOME Everyone Allow/Full Control
C$ Administrators Allow/Full Control

```

Parameters

Feature	Description
show -v	Print verbose details about SMB servers using the IP address or host name.
show -h, --help	Show this help message and exit.

License

The license command displays XCP license information.

Syntax

```
C:\Users\Administrator\Desktop\xcp>xcp license
```

Example

```

C:\Users\Administrator\Desktop\xcp>xcp license
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
Licensed to "Sushil Kumar (sushilk), NetApp Inc,
Sushil.Kumar@netapp.com" until Mon Apr 2

```

```
23:39:34 2018
License type: SANDBOX
License status: ACTIVE
Customer name: N/A
Project number: N/A
Offline Host: No
Send statistics: Yes
Host activation date: 2018-02-21 00:57:38
License management URL: https://xcp.netapp.comParameters
```

activate

The **activate** command activates the XCP license. Before running this command, verify that the license file is downloaded and copied on the C:\NetApp\XCP directory on the XCP host. The license can be activated on any number of hosts.

Syntax

```
C:\Users\Administrator\Desktop\xcp>xcp activate
(c) 2017 NetApp, Inc.
License file C:\NetApp\XCP\license not found.
Register for a license at https://xcp.netapp.com
Register for license and run xcp activate command to activate
the License.
```

Example

```
C:\Users\Administrator\Desktop\xcp>xcp activate
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
XCP activated
C:\Users\Administrator\Desktop\xcp>
```

scan

The **scan** command recursively scans the entire SMB share and lists all the files by the end of the scan command.

Syntax

```
C:\Users\Administrator\Desktop\xcp>xcp scan \\<SMB share path>
```

Example

```
C:\Users\Administrator\Desktop\xcp>xcp scan
\\10.61.87.235\volxcp
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
volxcp\3333.txt
volxcp\SMB.txt
volxcp\SMB1.txt
volxcp\com.txt
```

```

volxcp\commands.txt
volxcp\console.txt
volxcp\linux.txt
volxcp\net use.txt
volxcp\newcom.txt
volxcp\notepad.txt
11 scanned, 0 errors, 0s
Sending statistics...
C:\Users\Administrator\Desktop\xcp>Parameters

```

The following table lists scan parameters and their description.

Feature	Description
scan -h, --help	Show this help message and exit.
scan -v	Increase debug verbosity.
scan -parallel <n>	Number of concurrent processes (default: <cpu-count>).
scan -match <filter>	Only process files and directories that match the filter
scan -preserve-atime	Restore last accessed date on source.
scan -depth <n>	Limit the search depth to n levels.
scan -stats	Print tree statistics report.
scan -l	File listing output formats
scan -ownership	Retrieve ownership information of files and directories on the source system.
scan -du	Summarize space usage of each directory including subdirectories
scan -fmt <expression>	Format file listing according to the Python expression (see `xcp help -fmt` for details).

scan --help

This option displays detailed information about how to use the scan command.

```

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp scan --help
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
usage: xcp scan [-h] [-v] [-parallel <n>] [-match <filter>] [-
preserve-atime]
[-depth <n>] [-stats] [-l] [-ownership] [-du]
[-fmt <expression>]
source
positional arguments:
source
optional arguments:
-h, --help show this help message and exit

```



```

-v increase debug verbosity
-parallel <n> number of concurrent processes (default: <cpu-
count>)
-match <filter> only process files and directories that match
the filter
(see `xcp help -match` for details)
-preserve-atime restore last accessed date on source
-depth <n> limit the search depth
-stats print tree statistics report
-l detailed file listing output
-ownership retrieve ownership information
-du summarize space usage of each directory including
subdirectories
-fmt <expression> format file listing according to the python
expression
(see `xcp help -fmt` for details)

```

scan -v

The scan -v command increases debug verbosity. This provides detailed logging information to troubleshoot or debug in case an error or warning is reported.

```

C:\XCP>xcp scan -v \\10.61.77.189\vol_SMB_source_sushil
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
---Truncated Output ---
14 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.18334_none_d49e6af338225fe5\S
tructuredQuery.dll
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostexe_
31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb77377
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.18334_none_d49e6af338225fe5
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostproxy_
31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9\Presentati
o
nHostProxy.dll
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_enus_
afd9853581041992\wsapi.dll.mui
vol_SMB_source_sushil\WinSxS\x86_windows-media-
speechsynthesiswinrt_
31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\s
peech-synthesis.xsd
vol_SMB_source_sushil\WinSxS\x86_windows-media-
speechsynthesiswinrt_
31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\s

```

```

ynthesis-core.xsd
vol_SMB_source_sushil\WinSxS\x86_windows-media-
speechsynthesiswinrt_
31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\W
indows.Media.SpeechSynthesis.dll
vol_SMB_source_sushil\WinSxS\x86_windows-media-
speechsynthesiswinrt_
31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\x
ml.xsd
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostproxy_
31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_enus_
afd9853581041992
vol_SMB_source_sushil\WinSxS\x86_windows-media-
speechsynthesiswinrt_
31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3
vol_SMB_source_sushil\WinSxS
vol_SMB_source_sushil
161,951 scanned, 0 errors, 3m10s
Sending statistics...
C:\XCP>

```

scan -parallel <n>

Set a higher or lower number of XCP concurrent processes.

Note: The maximum value for n is 61.

```

C:\XCP>xcp scan -parallel 8 \\10.61.77.189\vol_SMB_source_sushil
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
--Truncated Output ---
vol_SMB_source_sushil\ADFS\bg\Microsoft.IdentityServer.Web.Resou
rces.dll
vol_SMB_source_sushil\Boot\PCAT\bootmgr
vol_SMB_source_sushil\Boot\PCAT\bootnxt
vol_SMB_source_sushil\Boot\PCAT\memtest.exe
vol_SMB_source_sushil\Boot\Resources\bootres.dll
vol_SMB_source_sushil\apppatch\apppatch64\AcGenral.dll
vol_SMB_source_sushil\apppatch\apppatch64\acspefc.dll
vol_SMB_source_sushil\apppatch\apppatch64\AcLayers.dll
vol_SMB_source_sushil\apppatch\apppatch64\AcWinRT.dll
vol_SMB_source_sushil\apppatch\apppatch64\AcXtrnal.dll
vol_SMB_source_sushil\apppatch\apppatch64\sysmain.sdb
vol_SMB_source_sushil\ADFS\ar\Microsoft.IdentityServer.Web.Resou
rces.dll
vol_SMB_source_sushil\ADFS\cs\Microsoft.IdentityServer.Web.Resou
rces.dll
vol_SMB_source_sushil\apppatch\en-US\AcRes.dll.mui

```

```

vol_SMB_source_sushil\Branding\ShellBrd
vol_SMB_source_sushil\ADFS\et\Microsoft.IdentityServer.Web.Resources.dll
vol_SMB_source_sushil\ADFS\es
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsdlapi.resources_31bf3856ad364e35_6.3.9600.16384_enus_afd9853581041992
vol_SMB_source_sushil\WinSxS
vol_SMB_source_sushil
161,951 scanned, 0 errors, 3m1s
15 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
Sending statistics...
C:\XCP>

```

scan -match

Only process files and directories that match the filter.

In the following example, the scan command scans all files that have changed between 1 month and 1 year and prints a line to the console for each file found. The ISO format of its last modification time, a human-readable size of the file, its type, and its relative path are returned for each file.

```

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp scan -match
"1*month < modified < 1*year" -fmt "'{:>15} {:>7} {}
{}'.format(iso(mtime), humanize_size(size), type, relpath)"
\\10.61.87.235\volxcp
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
2016-10-26_15:13:24 459KiB regular
volxcp\FlexArray_Virtualization_Implementation_Guide_for.pdf
2016-10-26_15:13:24 471KiB regular
volxcp\FlexArray_Virtualization_Implementation_Guide_for-
ECMLP2492777.pdf
2016-10-26_15:13:24 845KiB regular
volxcp\FlexArray_Virtualization_Installation.pdf
2016-10-26_15:13:30 10.3KiB regular volxcp\index.html
169 scanned, 0 errors, 4 matched, 165 filtered, 1s
Sending statistics...
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>.

```

In the following example, the scan command with -match lists the files that have not been modified for more than 3 months and have a size bigger than 4MB.

```

C:\XCP> xcp scan -match "modified > 3*month and size > 4194304"
-fmt "'{}, {}, {}'.format(iso(mtime), humanize_size(size),
relpath)" \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
----truncated output ----

```

```

5_none_3a3e8d569d2ef7d0\AuthFWSnapin.dll
2013-08-21_21:16:47.349002, 5.65MiB,
vol_SMB_source_sushil\WinSxS\x86_setup-uxwizard-
serverimages_31bf3856ad364e35_6.3.9600.
16384_none_90f3fd030be9354b\spwizimg_svr.dll
2016-11-29_22:34:16, 5.10MiB,
vol_SMB_source_sushil\WinSxS\x86_system.web_b03f5f7f11d50a3a_4.0
.9600.21787_none_a60453d9d63c1
97d\System.Web.dll
161,951 scanned, 0 errors, 554 matched, 161,397 filtered, 56s
Sending statistics...
C:\XCP>

```

The following example matches only the directories, and the formatting adds a comma between the variables mtime relative path and depth.

The second command redirects the same output to name.csv.

```

C:\XCP>xcp scan -match "type is directory" -fmt
"','.join(map(str, [iso(mtime), relpath, depth]))"
\\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
5_none_772d3d6585ce775c,2
2017-07-
11_03:30:46.998151,vol_SMB_source_sushil\WinSxS\x86_windows-
media-speechsynthesis-winrt_31bf3856ad364e35_6.3.9600.17
415_none_148a01188942cbc3,2
2017-07-
11_03:30:47.076284,vol_SMB_source_sushil\WinSxS\x86_windowssearc
hengine-structuredquery_31bf3856ad364e35_7.0.9600.18
334_none_d49e6af338225fe5,2
2017-07-11_03:30:47.091897,vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_b
f2adb339568b2a9,2
2017-07-11_03:30:47.091897,vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_049
3f7d83bb77377,2
2017-07-
11_03:30:47.091897,vol_SMB_source_sushil\WinSxS\x86_wsapi.resou
rces_31bf3856ad364e35_6.3.9600.16384_en-us_afd985358
1041992,2
2017-07-11_03:21:27.409746,vol_SMB_source_sushil\WinSxS,1
2017-07-11_03:11:52.209009,vol_SMB_source_sushil,0
161,951 scanned, 0 errors, 26,838 matched, 135,113 filtered,
1m25s
Sending statistics...

```

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp scan -match
"type is directory" -fmt "''.join(map(str, [iso(mtime),
relpath, depth]))" \\10.61.87.235\volxcp > name.csv
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
Sending statistics...
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

The following example prints the full path and the raw mtime value of all the files that are not directories. The mtime value is padded with 70 chars to facilitate a readable console report.

```
C:\XCP>xcp scan -match "type is not directory" -fmt "'{}
{:>70}'".format(abspath, mtime)"
\\10.61.77.189\vol_SMB_source_sushil
--truncatd ouput -
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\cht_boot.ttf
1473727853.7621033
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\jpn_boot.ttf
1473727853.6370556
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\kor_boot.ttf
1473727853.6839266
17 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\malgunn_boot.ttf
1473727853.0746298
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\malgun_boot.ttf
1473727853.0432982
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\meiryon_boot.ttf
1473727853.215172
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\meiryo_boot.ttf
1473727853.1057887
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\msjhn_boot.ttf
1473727853.0432982
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\msjh_boot.ttf
1473727853.1370487
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\msyhn_boot.ttf
1473727853.3714175
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\msyh_boot.ttf
1473727853.293295
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\segmono_boot.ttf
1473727853.4026694
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\segoen_slboot.tt
f 1473727853.43394
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\segoe_slboot.ttf
1473727853.5120814
\\10.61.77.189\vol_SMB_source_sushil\Boot\Fonts\wgl4_boot.ttf
1473727853.480806
161,951 scanned, 0 errors, 135,113 matched, 26,838 filtered,
2m36s
Sending statistics...
```

```
C:\XCP>
```

scan -preserve-atime

Restores the last accessed date of all the files on the source.

When we scan a SMB share, the access time is modified on the files (if the storage system is configured to modify atime on read), because XCP is reading the files one by one.

XCP never changes the atime. XCP just reads the file, which triggers an update on atime.

Use the -preserve-atime option to reset the atime to the original value before XCP read the file.

```
C:\XCP>xcp scan -preserve-atime
\\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
----Truncated Output ----
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none_d49e6af3382
25fe5
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b382
502ca
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d
83bb77377
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2ad
b339568b2a9\Presentatio
nHostProxy.dll
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-us_afd9853581041992\wsapi.dll.mui
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2ad
b339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-us_afd9853581041992
vol_SMB_source_sushil\WinSxS
vol_SMB_source_sushil
161,951 scanned, 0 errors, 3m8s
Sending statistics...
C:\XCP> scan -fmt <string expression>
```

scan -depth <n>

Limit the search depth of directories inside an SMB share.

Note: This -depth option specifies how deep XCP can scan the files into the subdirectories.

```
C:\XCP>xcp scan -depth 2 \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
```

```

----Truncated Output ----
vol_SMB_source_sushil\WinSxS\x86_windows-storage-compression-
winrt_31bf3856ad364e35_6.3.9600.16384_none_76e0a28986080ad4
18 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
vol_SMB_source_sushil\WinSxS\x86_windows-storage-compression-
winrt_31bf3856ad364e35_6.3.9600.17415_none_772d3d6585ce775c
vol_SMB_source_sushil\WinSxS\x86_windowssearchcomponent_31bf3856
ad364e35_6.3.9600.16384_none_6e5dcc624ee39dcd
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3
vol_SMB_source_sushil\WinSxS\x86_windows-storage-
applicationdata-
winrt_31bf3856ad364e35_6.3.9600.16384_none_7910a646f21d8fb4
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b382
502ca
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17415_none_d4b523c3381
124e0
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none_d49e6af3382
25fe5
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d
83bb77377
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2ad
b339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-us_afd9853581041992
vol_SMB_source_sushil\WinSxS
vol_SMB_source_sushil
30,653 scanned, 0 errors, 31s
Sending statistics...

```

scan -stats

Tree statistics report formats.

```

C:\XCP>xcp scan -stats \\10.61.77.189\vol_SMB_source_sushil
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
31,361 scanned, 0 errors, 5s
60,073 scanned, 0 errors, 10s
86,835 scanned, 0 errors, 15s
109,688 scanned, 0 errors, 20s
122,258 scanned, 0 errors, 25s
135,516 scanned, 0 errors, 30s
145,849 scanned, 0 errors, 35s
156,390 scanned, 0 errors, 40s

```

```

== Maximum Values ==
Size Depth Namelen Dirsize
369MiB 10 165 38209
== Average Values ==
Size Depth Namelen Dirsize
104KiB 3 57 6
== Top File Extensions ==
.manifest .dll .cat .mui .mum .exe other
38964 23776 16300 8459 5684 3610 38320
== Number of files ==
empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB
38 80300 36914 15665 2049 144 3
== Space used ==
empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB
0 117MiB 750MiB 3.66GiB 5.48GiB 2.79GiB 612MiB
== Directory entries ==
empty 1-10 10-100 100-1K 1K-10K >10k
164 26011 615 37 8 3
== Depth ==
0-5 6-10 11-15 16-20 21-100 >100
159808 2143
19 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
== Modified ==
>1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future
92396 47118 22437
== Created ==
>1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future
161951
Total count: 161951
Directories: 26838
Regular files: 135113
Symbolic links:
Junctions:
Special files:
Total space for regular files: 13.4GiB
Total space for directories: 0
Total space used: 13.4GiB
161,951 scanned, 0 errors, 43s
Sending statistics...

```

scan -l

Use the scan -l command for detailed file listing output.

```

C:\XCP>xcp scan -l \\10.61.77.189\vol_SMB_source_sushil
XCP 1.5; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp
Inc] until Mon
Apr 2 23:39:34 2018
f 125KiB 154d15h
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_

```



```

31bf3856ad364e35_7.0.9600.17031_none
_d49b7b2b382502ca\StructuredQuery.dll
f 492KiB 1y72d
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.18334_none
_d49e6af338225fe5\StructuredQuery.dll
f 71.1KiB 154d15h
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.17415_none
_d4b523c3381124e0\StructuredQuery.dll
f 31.6KiB 154d15h vol_SMB_source_sushil\WinSxS\x86_windows-
storage-applicationdatawinrt_
31bf3856ad364e35_6.3.9600.16384_no
ne_7910a646f21d8fb4\Windows.Storage.ApplicationData.dll
f 234KiB 3y331d
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostexe_
31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb
77377\PresentationHost.exe
d 0 154d15h
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.17031_none
_d49b7b2b382502ca
d 0 6d17h
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.18334_none
_d49e6af338225fe5
d 0 154d15h
vol_SMB_source_sushil\WinSxS\x86_windowssearchenginestructuredqu
ery_
31bf3856ad364e35_7.0.9600.17415_none
_d4b523c3381124e0
d 0 154d15h vol_SMB_source_sushil\WinSxS\x86_windows-storage-
applicationdatawinrt_
31bf3856ad364e35_6.3.9600.16384_no
ne_7910a646f21d8fb4
d 0 6d17h
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostexe_
31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb
77377
f 45.5KiB 3y331d
vol_SMB_source_sushil\WinSxS\x86_wpfpresentationhostproxy_
31bf3856ad364e35_6.3.9600.16384_none_bf2adb339
568b2a9\PresentationHostProxy.dll
f 2KiB 3y291d
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_enus_

```

```

afd9853581041992\
wsdapi.dll.mui
d 0 6d17h
vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e
35_6.3.9600.16384_enus_
afd9853581041992
d 0 6d17h vol_SMB_source_sushil\WinSxS
d 0 6d17h vol_SMB_source_sushil
20 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
161,951 scanned, 0 errors, 3m16s
Sending statistics...
C:\XCP>scan -q

```

scan -ownership

Retrieves ownership information for files.

Note: The -ownership option can only be used with -l, -match, -fmt, or -stats options.

```

C:\XCP>xcp scan -l -ownership
\\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated output -----
f DOMAIN\kumar_sushil 2KiB 3y291d
vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-
us_afd9853581041992\wsdapi.dll.mui
d DOMAIN\kumar_sushil 0 6d17h
vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-
us_afd9853581041992
d DOMAIN\kumar_sushil 0 6d18h vol_SMB_source_sushil\WinSxS
d DOMAIN\kumar_sushil 0 6d18h vol_SMB_source_sushil
161,951 scanned, 0 errors, 4m8s
Sending statistics...
C:\XCP>

```

scan -du

Summarize space usage of each directory, including subdirectories.

```

C:\XCP>xcp scan -du \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output ---
71.1KiB vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17415_none_d4b523c33
81124e0
31.6KiB vol_SMB_source_sushil\WinSxS\x86_windows-storage-
applicationdata-
winrt_31bf3856ad364e35_6.3.9600.16384_none_7910a64

```

```

6f21d8fb4
125KiB vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b3
82502ca
2.85KiB
vol_SMB_source_sushil\WinSxS\x86_windowssearchcomponent_31bf3856
ad364e35_6.3.9600.16384_none_6e5dcc624ee39dcd
202KiB vol_SMB_source_sushil\WinSxS\x86_windows-media-
speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188
942cbc3
234KiB vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d
83bb77377
45.5KiB vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2ad
b339568b2a9
2KiB
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-us_afd9853581041992
7.27GiB vol_SMB_source_sushil\WinSxS
13.4GiB vol_SMB_source_sushil
161,951 scanned, 0 errors, 1m3s
Sending statistics...
C:\XCP>.

```

scan -fmt <expression>

Formats file listing according to the defined expression.

```

C:\XCP>xcp scan -fmt "'', '.join(map(str, [relpath, name, size,
depth]))" \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
---Truncated Output -----
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3,
x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3, 0,
2
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b382
502ca,
x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b382
502ca, 0, 2
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-us_afd9853581041992\wsapi.dll.mui, wsd
api.dll.mui, 2048, 3
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e
35_6.3.9600.16384_en-us_afd9853581041992, x86_wsapi.resourc

```

```
es_31bf3856ad364e35_6.3.9600.16384_en-us_afd9853581041992, 0, 2
vol_SMB_source_sushil\WinSxS, WinSxS, 0, 1
vol_SMB_source_sushil, , 0, 0
161,951 scanned, 0 errors, 3m24s
Sending statistics...
```

copy

The copy command scans and copies the entire source directory structure to a destination SMB share. The copy command requires having source and destination paths as variables. The scanned and copied files, throughput/speed, and elapsed time details are printed to the console once every 5 seconds.

Notes:

- The run-time log file is stored under C:\NetApp\XCP.
- This command copies data without ACL.

Syntax

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp copy \\<source
SMB share> \\<destination SMB share>
```

Example

```
C:\XCP>xcp copy \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----truncated Output -----
150,978 scanned, 0 errors, 0 skipped, 148,755 copied, 12.3GiB
(19.7MiB/s), 6m20s
151,935 scanned, 0 errors, 0 skipped, 150,453 copied, 12.4GiB
(17.6MiB/s), 6m25s
153,975 scanned, 0 errors, 0 skipped, 152,179 copied, 12.5GiB
(21.3MiB/s), 6m30s
156,521 scanned, 0 errors, 0 skipped, 153,698 copied, 12.6GiB
(23.1MiB/s), 6m35s
157,013 scanned, 0 errors, 0 skipped, 155,088 copied, 12.7GiB
(23.6MiB/s), 6m40s
157,926 scanned, 0 errors, 0 skipped, 156,342 copied, 13.0GiB
(45.2MiB/s), 6m45s
159,947 scanned, 0 errors, 0 skipped, 158,116 copied, 13.0GiB
(17.0MiB/s), 6m50s
161,497 scanned, 0 errors, 0 skipped, 159,747 copied, 13.1GiB
(21.8MiB/s), 6m55s
161,952 scanned, 0 errors, 0 skipped, 160,845 copied, 13.2GiB
(16.8MiB/s), 7m0s
161,952 scanned, 0 errors, 0 skipped, 161,899 copied, 13.4GiB
(26.7MiB/s), 7m6s
161,952 scanned, 0 errors, 0 skipped, 161,951 copied, 13.4GiB
(32.1MiB/s), 7m6s
Sending statistics...
```

```
C:\XCP>.
```

Parameters

The following table provides a list of copy parameters and their description.

Feature	Description
copy -h, --help	Show this help message and exit.
copy -v	Increase debug verbosity.
copy -parallel <n>	Number of concurrent processes (default: <cpu-count>).
copy -match <filter>	Only process files and directories that match the filter (see `xcp help -match` for details).
copy -preserve-ctime	Restore last accessed date on source.
Copy -acl	Copy security information.
copy -fallback-user FALLBACK_USER	A user on the target machine to receive the permissions of local (nondomain) source machine users (example: domain\administrator).
copy -fallback-group FALLBACK_GROUP	A group on the target machine to receive the permissions of local (nondomain) source machine groups (example: domain\administrators).
copy -root	Copy ACL for root directory

copy --help

Displays detailed information about the copy command.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp copy --help
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
usage: xcp copy [-h]          [-v] [-parallel <n>] [-match <filter>]
               [-preserve-ctime]
               [-acl] [-fallback-user FALLBACK_USER]
               [-fallback-group FALLBACK_GROUP]
               [-root] source target
positional arguments:
source
target
optional arguments:
-h, --help            show this help message and exit
-v                    increase debug verbosity
-parallel <n>         number of concurrent processes (default:
<cpu-count>)
-match <filter>       only process files and directories that
match the
                       filter (see `xcp help -match` for details)
```

```

-preserve-ptime      restore last accessed date on source
-acl                 copy security information
-fallback-user FALLBACK_USER
                     a user on the target machine to receive the
                     permissions of local (non-domain) source
machine users
                     (eg. domain\administrator)
-fallback-group FALLBACK_GROUP
                     a group on the target machine to receive the
                     permissions of local (non-domain) source
machine
                     groups (eg. domain\administrators)
-root                copy acl for root directory
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>

```

copy -v

Increase debug verbosity.

```

C:\XCP>xcp copy -v
\\10.61.77.189\vol_SMB_source_sushil\warning
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx
xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029
ERROR failed to copy "write.exe": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\write.exe'
ERROR failed to copy "setuperr.log": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\setuperr.log'
ERROR failed to copy "splwow64.exe": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\splwow64.exe'
ERROR failed to copy "system.ini": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\system.ini'
ERROR failed to copy "vmgcoinstall.log": [Errno 13]
Permission denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\vmgcoinstall.lo
g'
ERROR failed to copy "pyshellext.amd64.dll": [Errno 13]
Permission denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\pyshellext.amd6
4.dll'
ERROR failed to copy "win.ini": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\win.ini'
ERROR failed to copy "WindowsShell.Manifest": [Errno 13]
Permission denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\WindowsShell.Ma
nifest'

```

```

        ERROR failed to copy "WindowsUpdate.log": [Errno 13]
Permission denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\WindowsUpdate.l
og'
        ERROR failed to copy "winhlp32.exe": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\winhlp32.exe'
        ERROR failed to copy "py.exe": [Errno 13] Permission
denied: '\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\py.exe'
        ERROR failed to copy "pyw.exe": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\pyw.exe'
        ERROR failed to copy "regedit.exe": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\regedit.exe'
        ERROR failed to copy "ServerStandard.xml": [Errno 13]
Permission denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\ServerStandard.
xml'
        ERROR failed to copy "ServerWeb.xml": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\ServerWeb.xml'
        ERROR failed to copy "setupact.log": [Errno 13] Permission
denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\setupact.log'
17 scanned, 16 errors, 0 skipped, 0 copied, 0 (0/s), 1s
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reserved.
        Sending statistics...
C:\\XCP>

```

copy -parallel <n>

Set a higher or lower number of XCP concurrent processes.

The default value for -parallel is equal to the count of CPU.

Note: The maximum value for n is 61.

```

C:\\XCP>xcp copy -parallel 7
\\10.61.77.189\\vol_SMB_source_sushil\\Microsoft.NET
\\10.61.77.56\\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
2,538 scanned, 0 errors, 0 skipped, 878 copied, 230MiB
(45.5MiB/s), 5s
2,798 scanned, 0 errors, 0 skipped, 2,130 copied, 455MiB
(45.0MiB/s), 10s
2,798 scanned, 0 errors, 0 skipped, 2,797 copied, 547MiB
(45.1MiB/s), 12s
Sending statistics...

```

```
C:\XCP>.
```

copy -match <filter>

Copies only the data that matches the argument passed.

```
C:\XCP>xcp copy -match "'Microsoft' in name"
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
41,694 scanned, 0 errors, 0 skipped, 5,279 copied, 368MiB
(9.74MiB/s), 34s
67,120 scanned, 0 errors, 0 skipped, 5,285 copied, 369MiB
(25.9KiB/s), 39s
89,103 scanned, 0 errors, 0 skipped, 5,321 copied, 369MiB
(35.9KiB/s), 44s
100,784 scanned, 0 errors, 0 skipped, 5,415 copied, 375MiB
(1.31MiB/s), 49s
108,328 scanned, 0 errors, 0 skipped, 5,660 copied, 376MiB
(121KiB/s), 54s
117,816 scanned, 0 errors, 0 skipped, 5,678 copied, 376MiB
(20.3KiB/s), 59s
125,034 scanned, 0 errors, 0 skipped, 5,831 copied, 381MiB
(1007KiB/s), 1m4s
133,339 scanned, 0 errors, 0 skipped, 6,114 copied, 398MiB
(3.44MiB/s), 1m9s
139,059 scanned, 0 errors, 0 skipped, 6,996 copied, 427MiB
(5.82MiB/s), 1m14s
143,687 scanned, 0 errors, 0 skipped, 7,758 copied, 472MiB
(9.08MiB/s), 1m19s
151,053 scanned, 0 errors, 0 skipped, 8,009 copied, 474MiB
(238KiB/s), 1m24s
157,356 scanned, 0 errors, 0 skipped, 8,037 copied, 474MiB
(28.6KiB/s), 1m29s
161,952 scanned, 0 errors, 0 skipped, 8,252 copied, 482MiB
(5.16MiB/s), 1m33s
Sending statistics...
C:\XCP>
```

copy -preserve-atime

Resets the atime to the original value before XCP read the file.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp copy -preserve-
atime \\10.61.87.235\volxcp \\10.216.50.212\xcp1_test1
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
330 scanned, 0 errors, 0 skipped, 70 copied, 57.2MiB
(11.4MiB/s), 5s
330 scanned, 0 errors, 0 skipped, 201 copied, 142MiB
(16.9MiB/s), 10s
```



```
330 scanned, 0 errors, 0 skipped, 311 copied, 229MiB
(17.4MiB/s), 15s
330 scanned, 0 errors, 0 skipped, 329 copied, 232MiB
(15.1MiB/s), 15s
Sending statistics...
```

copy -acl

Activates the transfer of the security descriptors (ACLs).

Use the -acl parameter with the -fallback-user and -fallback-group options to specify a user and a group on the target machine or from Active Directory to receive the permissions of local (nondomain) source machine users or groups. This does not refer to unmatched users from Active Directory.

sync

The sync command scans for changes and modifications in the source and target shares in parallel, and applies the appropriate actions (remove, modify, rename, and so on) to the target to make sure that the target is identical to the source.

The sync command compares data content, time stamps, file attributes, ownership, and security information.

Syntax

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync \\<source
SMB share> \\<destination SMB share>
```

Example

```
C:\XCP>xcp sync \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output ---
306,844 scanned, 305,223 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m42s
308,104 scanned, 307,169 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m47s
309,966 scanned, 309,581 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m52s
310,526 scanned, 310,473 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m57s
313,336 scanned, 311,752 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m2s
314,658 scanned, 313,848 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m7s
315,981 scanned, 315,870 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m12s
319,054 scanned, 317,506 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m17s
```

```

320,283 scanned, 319,516 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m22s
321,548 scanned, 321,418 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m27s
323,332 scanned, 322,986 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m32s
323,902 scanned, 323,902 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m35s
Sending statistics...
C:\XCP>.

```

Parameters

The following table lists the sync parameters and their description.

Feature	Description
sync -h, --help	Show this help message and exit.
sync -v	Increase debug verbosity.
sync -parallel <n>	Number of concurrent processes (default: <cpu-count>).
sync -match <filter>	Only process files and directories that match the filter (see `xcp help -match` for details).
sync -preserve-atime	Restore last accessed date on source.
sync -nodata	Do not check data.
sync -noatime	Do not check file access time.
sync -noctime	Do not check file creation time.
sync -nomtime	Do not check file modification time.
sync -noattrs	Do not check attributes.
sync -noownership	Do not check ownership.
sync -atimewindow <float>	Acceptable access time difference, in seconds.
sync -ctimewindow <float>	Acceptable creation time difference, in seconds.
sync -mtimewindow <float>	Acceptable modification time difference, in seconds,
sync -acl	Copy security information,
sync -fallback-user FALLBACK_USER	User on the target machine to receive the permissions of local (nondomain) source machine users (example: domain\administrator),
sync -fallback-group FALLBACK_GROUP	Group on the target machine to receive the permissions of local (nondomain) source machine groups (example: domain\administrators),

Feature	Description
sync -l	Increase output detail.
sync -root	Sync ACL for root directory

sync --help

Displays detailed information about the sync command.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp help sync
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
usage: xcp sync [-h] [-v] [-parallel <n>] [-match <filter>] [-
preserve-ctime]
[-nodata] [-noatime] [-noctime] [-nomtime] [-noattrs]
[-noownership] [-atimewindow <float>] [-ctimewindow <float>]
[-mtimewindow <float>] [-acl] [-fallback-user FALLBACK_USER]
[-fallback-group FALLBACK_GROUP] [-l] [-root]
source target
Note: ONTAP does not let a SMB client modify COMPRESSED or
ENCRYPTED attributes.
XCP sync will ignore these file attributes.
positional arguments:
source
target
optional arguments:
-h, --help            show this help message and exit
-v                    increase debug verbosity
-parallel <n>         number of concurrent processes (default:
<cpu-count>)
-match <filter>       only process files and directories that
match the filter
                     (see `xcp help -match` for details)
-preserve-ctime       restore last accessed date on source
-nodata              do not check data
-noatime             do not check file access time
-noctime            do not check file creation time
-nomtime            do not check file modification time
-noattrs            do not check attributes
-noownership        do not check ownership
-atimewindow <float>  acceptable access time difference in
seconds
-ctimewindow <float>  acceptable creation time difference in
seconds
-mtimewindow <float>  acceptable modification time difference
in seconds
-acl                  copy security information
-fallback-user FALLBACK_USER
```

```

a user on the target machine to receive the
permissions of local (non-domain) source machine users (eg.
domain\administrator)
-fallback-group FALLBACK_GROUP
a group on the target machine to receive the
permissions of local (non-domain) source machine groups (eg.
domain\administrators)
-l increase output detail
-root sync acl for root directory

```

sync -v

Increase debug verbosity.

```

C:\XCP>xcp sync -v \\10.61.77.189\vol_SMB_source_sushil\warning
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
ERROR failed to remove from target
"assembly\GAC_32\Microsoft.CertificateServices.PKIClient.Cmdlets
\v4.0_6.3.0.0__31bf3856ad364e35\pki.psd1": [Errno 13] Access is
denied: '\\\\?\\UNC\\10.61.77.56\\vol_SMB_tar
shil\\assembly\\GAC_32\\Microsoft.CertificateServices.PKIClient.
Cmdlets\\v4.0_6.3.0.0__31bf3856ad364e35\\pki.psd1'
ERROR failed to remove from target
"assembly\GAC_64\Microsoft.GroupPolicy.AdmTmplEditor\v4.0_6.3.0.
0__31bf3856ad364e35\Microsoft.GroupPolicy.AdmTmplEditor.dll":
[Errno 13] Access is denied: '\\\\?\\UNC\\10.61.
\\vol_SMB_target_sushil\\assembly\\GAC_64\\Microsoft.GroupPolicy.
AdmTmplEditor\\v4.0_6.3.0.0__31bf3856ad364e35\\Microsoft.GroupPo
licy.AdmTmplEditor.dll'
1,933 scanned, 1,361 compared, 2 errors, 0 skipped, 0 copied,
1,120 removed, 5s
ERROR failed to remove from target
"assembly\GAC_64\System.Printing\v4.0_4.0.0.0__31bf3856ad364e35\
System.Printing.dll": [Errno 13] Access is denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\assembly\
4\\System.Printing\\v4.0_4.0.0.0__31bf3856ad364e35\\System.Print
ing.dll'
ERROR failed to remove from target
"assembly\GAC_MSIL\Microsoft.PowerShell.Workflow.ServiceCore\v4.
0_3.0.0.0__31bf3856ad364e35\Microsoft.PowerShell.Workflow.Servic
eCore.dll": [Errno 13] Access is denied: '\\\\
\\10.61.77.56\\vol_SMB_target_sushil\\assembly\\GAC_MSIL\\Micros
oft.PowerShell.Workflow.ServiceCore\\v4.0_3.0.0.0__31bf3856ad364
e35\\Microsoft.PowerShell.Workflow.ServiceCore.dll'
ERROR failed to remove from target
"assembly\GAC_MSIL\Microsoft.RightsManagementServices.ServerMana
ger.DeploymentPlugin\v4.0_6.3.0.0__31bf3856ad364e35\Microsoft.Ri
ghtsManagementServices.ServerManager.Deploymen

```

```

n.dll": [Errno 13] Access is denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\assembly\\GAC_MSIL\\Microsoft.RightsManagementServices.ServerManager.Deployment
Plugin\\v4.0_6.3.0.0__31bf3856ad364e35\\Mic
.RightsManagementServices.ServerManager.DeploymentPlugin.dll'
ERROR failed to remove from target
"assembly\\GAC_MSIL\\Microsoft.WSMan.Management\\v4.0_3.0.0.0__31bf3856ad364e35\\Microsoft.WSMan.Management.dll": [Errno 13] Access
is denied: '\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_
_sushil\\assembly\\GAC_MSIL\\Microsoft.WSMan.Management\\v4.0_3.
0.0.0__31bf3856ad364e35\\Microsoft.WSMan.Management.dll'
ERROR failed to remove from target
"assembly\\GAC_MSIL\\PresentationUI\\v4.0_4.0.0.0__31bf3856ad364e35
\\PresentationUI.dll": [Errno 13] Access is denied:
'\\\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\assembly\\
SIL\\PresentationUI\\v4.0_4.0.0.0__31bf3856ad364e35\\Presentatio
nUI.dll'
ERROR failed to remove from target
"assembly\\GAC_MSIL\\System.IO.Compression.FileSystem\\v4.0_4.0.0.0
__b77a5c561934e089\\System.IO.Compression.FileSystem.dll": [Errno
13] Access is denied: '\\\\\\?\\UNC\\10.61.71.5
_SMB_target_sushil\\assembly\\GAC_MSIL\\System.IO.Compression.Fi
leSystem\\v4.0_4.0.0.0__b77a5c561934e089\\System.IO.Compression.
FileSystem.dll'
ERROR failed to remove from target
"assembly\\GAC_MSIL\\System.IdentityModel.Selectors\\v4.0_4.0.0.0__
b77a5c561934e089\\System.IdentityModel.Selectors.dll": [Errno 13]
Access is denied: '\\\\\\?\\UNC\\10.61.77.56\\v
s_target_sushil\\assembly\\GAC_MSIL\\System.IdentityModel.Select
ors\\v4.0_4.0.0.0__b77a5c561934e089\\System.IdentityModel.Select
ors.dll'
2,747 scanned, 2,675 compared, 9 errors, 0 skipped, 0 copied,
2,624 removed, 10s
ERROR failed to remove from target
"assembly\\GAC_MSIL\\System.Web.DataVisualization\\v4.0_4.0.0.0__31
bf3856ad364e35\\System.Web.DataVisualization.dll": [Errno 13]
Access is denied: '\\\\\\?\\UNC\\10.61.77.56\\vol_c
rget_sushil\\assembly\\GAC_MSIL\\System.Web.DataVisualization\\v
4.0_4.0.0.0__31bf3856ad364e35\\System.Web.DataVisualization.dll'
2,831 scanned, 2,831 compared, 10 errors, 0 skipped, 0 copied,
2,787 removed, 10s
Sending statistics...
C:\\XCP>

```

sync -parallel <n>

Set a higher or lower number of XCP concurrent processes.

Note: The maximum value for n is 61. The sync -parallel <n> command syncs with number of concurrent processes (default: <cpu-count>).

```

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync -parallel
5 \\10.61.87.235\volxcp \\10.216.50.212\xcp1_test1
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
658 scanned, 244 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 5s
658 scanned, 606 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 10s
658 scanned, 658 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 10s
Sending statistics...
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>.

```

sync -match <filter>

Scans the source and target tree and compares only the files or directories that match the filter argument. If there are any differences, it applies the required actions on the target to keep them in sync.

```

C:\XCP>xcp sync -match "'Microsoft' in name"
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
137,244 scanned, 6,871 compared, 0 errors, 0 skipped, 5,100
copied, 0 removed, 1m35s
140,634 scanned, 7,734 compared, 0 errors, 0 skipped, 5,542
copied, 0 removed, 1m40s
143,774 scanned, 7,772 compared, 0 errors, 0 skipped, 5,561
copied, 0 removed, 1m45s
148,433 scanned, 7,997 compared, 0 errors, 0 skipped, 5,737
copied, 0 removed, 1m50s
151,594 scanned, 8,029 compared, 0 errors, 0 skipped, 5,754
copied, 0 removed, 1m55s
156,289 scanned, 8,037 compared, 0 errors, 0 skipped, 5,759
copied, 0 removed, 2m0s
159,331 scanned, 8,037 compared, 0 errors, 0 skipped, 5,759
copied, 0 removed, 2m5s
161,953 scanned, 8,253 compared, 0 errors, 0 skipped, 5,882
copied, 0 removed, 2m11s
161,953 scanned, 8,253 compared, 0 errors, 0 skipped, 5,882
copied, 0 removed, 2m12s
Sending statistics...
C:\XCP>.

```

sync -preserve-ctime

Resets the ctime to the original value before XCP read the file.

```

C:\XCP>xcp sync -preserve-atime
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
1,729 scanned, 777 compared, 0 errors, 0 skipped, 608 copied, 0
removed, 5s
1,967 scanned, 1,546 compared, 0 errors, 0 skipped, 1,301
copied, 0 removed, 10s
2,479 scanned, 2,291 compared, 0 errors, 0 skipped, 1,569
copied, 0 removed, 15s
2,799 scanned, 2,799 compared, 0 errors, 0 skipped, 1,735
copied, 0 removed, 19s
Sending statistics...
C:\XCP>.

```

sync -nodata

Syncs the source and destination without comparing the contents of the file.

```

C:\XCP>xcp sync -nodata \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
----Truncated Output -----
314,393 scanned, 313,445 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 8m57s
316,867 scanned, 315,662 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m2s
319,083 scanned, 317,528 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m7s
320,444 scanned, 319,786 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m12s
322,763 scanned, 321,926 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m17s
323,904 scanned, 323,904 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m21s
Sending statistics...
C:\XCP>

```

sync -noatime

Syncs all the differences of the source to the target, but it ignores files that only have differences in access time.

```

C:\XCP>xcp sync -noatime \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
4,782 scanned, 1,182 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 5s
--Truncated OutPut ---

```

```

309,920 scanned, 308,254 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m44s
311,298 scanned, 310,040 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m49s
311,951 scanned, 311,109 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m54s
314,175 scanned, 312,948 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m59s
316,254 scanned, 314,764 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m4s
317,676 scanned, 316,932 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m9s
320,162 scanned, 319,246 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m14s
321,700 scanned, 321,066 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m19s
323,236 scanned, 322,753 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m24s
323,904 scanned, 323,904 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m29s
Sending statistics...
C:\XCP>

```

sync -noctime

Syncs all the differences of the source to the target, but it ignores files that only have differences in creation time.

```

C:\XCP>xcp sync -noctime \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
----Truncated Output ----
314,578 scanned, 313,636 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m50s
316,013 scanned, 315,929 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m55s
319,215 scanned, 317,751 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m0s
320,440 scanned, 319,839 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m5s
322,611 scanned, 321,647 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m10s
323,713 scanned, 323,389 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m15s
323,904 scanned, 323,904 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m16s
Sending statistics...
C:\XCP>

```


sync -nomtime

Syncs all the differences of the source to the target, but it ignores files that only have differences in modification time.

```
C:\XCP>xcp sync -nomtime \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
29 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
5,639 scanned, 1,338 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 5s
5,771 scanned, 1,708 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 10s
-----Truncated Output -----
315,212 scanned, 314,594 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m48s
318,214 scanned, 316,141 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m53s
319,432 scanned, 318,106 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 11m58s
320,697 scanned, 320,173 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m3s
322,934 scanned, 322,205 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m8s
323,904 scanned, 323,904 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m12s
Sending statistics...
C:\XCP>
```

sync -noattrs

Syncs all the differences of the source to the target, but it ignores files that only have differences in file attributes. XCP copies a file only if it has a different content (the ACLs are transferred).

```
C:\XCP>xcp sync -noattrs \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
145,850 scanned, 145,450 compared, 0 errors, 0 skipped, 124,455
copied, 0 removed, 7m51s
146,604 scanned, 146,542 compared, 0 errors, 0 skipped, 125,243
copied, 0 removed, 7m56s
148,592 scanned, 147,855 compared, 0 errors, 0 skipped, 126,222
copied, 0 removed, 8m1s
149,361 scanned, 149,215 compared, 0 errors, 0 skipped, 127,001
copied, 0 removed, 8m6s
151,157 scanned, 150,442 compared, 0 errors, 0 skipped, 127,769
copied, 0 removed, 8m11s
151,850 scanned, 151,582 compared, 0 errors, 0 skipped, 128,446
copied, 0 removed, 8m16s
```

```

153,469 scanned, 152,668 compared, 0 errors, 0 skipped, 129,059
copied, 0 removed, 8m21s
154,845 scanned, 154,387 compared, 0 errors, 0 skipped, 129,969
copied, 0 removed, 8m26s
156,330 scanned, 155,298 compared, 0 errors, 0 skipped, 130,904
copied, 0 removed, 8m31s
157,001 scanned, 156,364 compared, 0 errors, 0 skipped, 131,563
copied, 0 removed, 8m36s
157,947 scanned, 157,846 compared, 0 errors, 0 skipped, 132,498
copied, 0 removed, 8m41s
159,742 scanned, 159,067 compared, 0 errors, 0 skipped, 133,277
copied, 0 removed, 8m46s
160,620 scanned, 160,421 compared, 0 errors, 0 skipped, 134,084
copied, 0 removed, 8m51s
161,750 scanned, 161,615 compared, 0 errors, 0 skipped, 134,809
copied, 0 removed, 8m56s
161,994 scanned, 161,994 compared, 0 errors, 0 skipped, 135,075
copied, 0 removed, 9m1s
Sending statistics...
C:\XCP>

```

sync -noownership

Syncs all the differences of the source to the target, but it ignores files that only have differences in ownership.

```

C:\XCP>xcp sync -noownership
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
302,909 scanned, 301,365 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m46s
307,632 scanned, 303,530 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m51s
308,434 scanned, 305,462 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 9m56s
310,824 scanned, 307,328 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m1s
313,238 scanned, 310,083 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m6s
314,867 scanned, 313,407 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m11s
318,277 scanned, 315,856 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m17s
321,005 scanned, 318,384 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m22s
322,189 scanned, 321,863 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m27s

```

```
323,906 scanned, 323,906 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 10m29s
Sending statistics...
C:\XCP>
```

sync -atimewindow <float>

The -atimewindow specifies the acceptable difference, in seconds, for the atime of a file, from source to destination. XCP does not report files as being different if the difference in atime is less than <value>.

In the following example, XCP accepts a difference in atime for up to 10 minutes between the source and the destination files, and it does not update the atime on the target.

```
C:\XCP>xcp sync -atimewindow 600
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
298,529 scanned, 298,131 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m28s
301,650 scanned, 299,823 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m33s
302,754 scanned, 301,705 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m38s
304,000 scanned, 303,757 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m43s
306,833 scanned, 305,202 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m48s
308,119 scanned, 307,200 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m54s
310,009 scanned, 309,634 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m59s
311,554 scanned, 310,487 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m4s
313,513 scanned, 312,004 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m9s
314,777 scanned, 314,008 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m14s
317,061 scanned, 315,992 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m19s
319,144 scanned, 317,642 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m24s
320,323 scanned, 319,590 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m29s
322,064 scanned, 321,519 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m34s
323,495 scanned, 323,169 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m39s
323,906 scanned, 323,906 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m41s
Sending statistics...
```

```
C:\XCP>
```

sync -ctimewindow <float>

The -ctimewindow specifies the acceptable difference, in seconds, for the ctime of a file, from source to destination. So XCP does not report files as being different if the difference in ctime is less than <value>.

```
C:\XCP>xcp sync -ctimewindow 600
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
305,956 scanned, 305,269 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m46s
309,398 scanned, 307,346 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m51s
310,190 scanned, 308,655 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m56s
311,348 scanned, 310,462 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m1s
312,761 scanned, 312,394 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m6s
313,159 scanned, 312,997 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m11s
316,137 scanned, 314,509 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m16s
317,241 scanned, 316,309 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m21s
318,369 scanned, 318,092 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m26s
320,902 scanned, 319,768 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m31s
321,888 scanned, 321,382 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m36s
322,670 scanned, 322,576 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m41s
323,565 scanned, 323,355 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m46s
323,906 scanned, 323,906 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 14m49s
Sending statistics...
C:\XCP>
```

sync -mtimewindow <float>

The -mtimewindow specifies the acceptable difference, in seconds, for the mtime of a file, from source to destination. So XCP does not report files as being different if the difference in mtime is less than <value>.

```

C:\XCP>xcp sync -mtimewindow 600
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
298,888 scanned, 298,871 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m33s
302,085 scanned, 300,536 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m38s
303,214 scanned, 302,418 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m43s
306,214 scanned, 304,162 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m48s
307,086 scanned, 305,665 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m53s
308,913 scanned, 307,683 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 12m58s
310,181 scanned, 309,932 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m3s
312,574 scanned, 310,522 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m8s
313,597 scanned, 312,046 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m13s
314,867 scanned, 314,112 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m18s
318,100 scanned, 316,048 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m23s
319,202 scanned, 317,741 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m28s
320,330 scanned, 319,633 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m33s
322,566 scanned, 321,600 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m38s
323,353 scanned, 323,015 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m43s
323,902 scanned, 323,902 compared, 0 errors, 0 skipped, 0
copied, 0 removed, 13m46s
Sending statistics...
C:\XCP>

```

sync -acl

XCP sync -acl -fallback-user <user> -fallback-group <group> compares the data and the security information from the source with the target and applies the required actions on the target. The -fallback-user and -fallback-group are a user or group on the target machine to receive the permissions of the local (nondomain) source users or groups.

Note: You cannot use the -acl option without the -fallback-user and -fallback-group options.

```

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync -acl -
fallback-user "DOMAIN\gabi" -fallback-group "DOMAIN\Group"
\\10.61.77.189\performance_SMB_home_dirs
\\10.61.77.56\performance_SMB_home_dirs
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
10,796 scanned, 4,002 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 5s
15,796 scanned, 8,038 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 10s
15,796 scanned, 8,505 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 15s
15,796 scanned, 8,707 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 20s
15,796 scanned, 8,730 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 25s
15,796 scanned, 8,749 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 30s
15,796 scanned, 8,765 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 35s
15,796 scanned, 8,786 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 40s
15,796 scanned, 8,956 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 45s
15,796 scanned, 9,320 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 50s
15,796 scanned, 9,339 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 55s
15,796 scanned, 9,363 compared, 0 errors, 0 skipped, 0 copied, 0
removed, 1m0s
15,796 scanned, 10,019 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m5s
15,796 scanned, 10,042 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m10s
15,796 scanned, 10,059 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m15s
15,796 scanned, 10,075 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m20s
15,796 scanned, 10,091 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m25s
15,796 scanned, 10,108 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m30s
15,796 scanned, 10,929 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m35s
15,796 scanned, 12,443 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m40s
15,796 scanned, 13,963 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m45s
15,796 scanned, 15,488 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m50s

```

15,796 scanned, 15,796 compared, 0 errors, 0 skipped, 0 copied,
0 removed, 1m51s

sync -l

Provides detailed logging information in the standard output of all the actions that are performed by XCP on the target.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync -l
\\10.61.87.235\volxcp \\10.216.50.212\xcp1_test1
32 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
Copied "New Bitmap Image.bmp"
Copied
"new\FlexArray_Virtualization_Implementation_Guide_for.pdf"
Copied
"new\Cluster_Management_Workflows_for_OnCommand_System.pdf"
Copied "new\FlexArray_Virtualization_Implementation_Guide_for-
ECMLP2492777.pdf"
Copied "new\index.html"
Copied "new\FlexArray_Virtualization_Installation.pdf"
Copied "new\ONTAP_9_Administrator_Authentication_and_RBAC.pdf"
Copied "new\ONTAP_9_Antivirus_Configuration_Guide.pdf"
Copied "new\Notice_for_ONTAP_91_RC1.pdf"
Copied "new\ONTAP_9_SMB_and_NFS_Auditing_Guide.pdf"
Copied
"new\ONTAP_9_Cluster_Management_Using_OnCommand_System.pdf"
Copied "new\ONTAP_9_Cluster_Management_Using_OnCommand_System-
ECMLP2572743.pdf"
Copied "new\ONTAP_9_Command_Map_for_7Mode_Administrators.pdf"
Copied "new\ONTAP_9_Cluster_Management_Using_OnCommand_System-
ECMLP2573234.pdf"
Copied "new\ONTAP_9_Disks_and_Aggregates_Power_Guide.pdf"
Copied "new\ONTAP_90_Volume_Disaster_Recovery_Preparation.pdf"
Copied "new\ONTAP_90_Volume_Move_Express_Guide.pdf"
Copied "new\ONTAP_90_Volume_Restore_Using_SnapVault_Express.pdf"
Copied "new\New folder"
File "mtime" changed, timestamps set for "new"
File attribute "archive" changed, attributes set for "new"
File "mtime" changed, timestamps set for "<root>"
Copied "new\ONTAP_91_Release_Notes.pdf"
File "mtime" changed, timestamps set for "new"
File "mtime" changed, timestamps set for "<root>"
72 scanned, 72 compared, 0 errors, 0 skipped, 68 copied, 0
removed, 4s
Sending statistics...
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

verify

The verify command reads both source and target shares and compares them, providing information about what is different. You can use the command on any source and destination, regardless of the tool used to perform the copy or sync.

Syntax

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp verify  
\\<source SMB share> \\<destination SMB share>
```

Example

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp verify -v  
\\10.61.87.235\volxcp \\10.216.50.212\xcp1_test1  
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp  
Inc] until Mon Dec 31 00:00:00 2029  
16 compared, 0 same, 1 different, 15 missing, 1s  
Sending statistics...  
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>The following table  
lists the verify parameters and their description.
```

Feature	Description
verify -h, --help	Show this help message and exit.
verify -v	Increase debug verbosity.
verify -parallel <n>	Number of concurrent processes (default: <cpu-count>).
verify -match <filter>	Only process files and directories that match the filter (see `xcp help -match` for details).
verify -preserve-ctime	Restore last accessed date on source.
verify -nodata	Do not check data.
verify -noatime	Do not check file access time.
verify -noctime	Do not check file creation time.
verify -nomtime	Do not check file modification time.
verify -noattrs	Do not check attributes.
verify -noownership	Do not check ownership.
verify -noacls	Do not check ACLs.
verify -atimewindow <float>	Acceptable access time difference, in seconds.
verify -ctimewindow <float>	Acceptable creation time difference, in seconds.
verify -mtimewindow <float>	Acceptable modification time difference, in seconds.

Feature	Description
verify -stats	Scan source and target trees in parallel and compare tree statistics.
verify -fallback-user FALLBACK_USER	A user on the target machine to translate the permissions of local (non-domain) source machine users (for example: domain\administrator)
verify -fallback-group FALLBACK_GROUP	A group on the target machine to translate the permissions of local (non-domain) source machine users (for example: domain\administrator)
verify -l	Detailed file listing output.
verify -root	Verify ACL for root directory

verify --help

Displays detailed information about the verify command.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp verify --help
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
usage: xcp verify [-h] [-v] [-parallel <n>] [-match <filter>]
[-preserve-atime] [-nodata] [-noatime] [-noctime] [-nomtime]
[-noattrs] [-noownership] [-atimewindow <float>]
[-ctimewindow <float>] [-mtimewindow <float>] [-stats] [-l]
source target
Note: ONTAP does not let a SMB host modify COMPRESSED or
ENCRYPTED attributes.
XCP sync will ignore these file attributes.
positional arguments:
source
target
optional arguments:
-h, --help            show this help message and exit
-v                    increase debug verbosity
-parallel <n>         number of concurrent processes (default:
<cpu-count>)
-match <filter>       only process files and directories that
match the filter
                     (see `xcp help -match` for details)
-preserve-atime       restore last accessed date on source
-nodata              do not check data
-noatime             do not check file access time
-noctime            do not check file creation time
-nomtime            do not check file modification time
-noattrs            do not check attributes
-noownership         do not check ownership
noacls              do not check acs
```

```

-atimewindow <float>      acceptable access time difference in
seconds
-ctimewindow <float>      acceptable creation time difference in
seconds
-mtimewindow <float>      acceptable modification time difference
in seconds
-fallback-user FALLBACK_USER
                        a user on the target machine to translate the
permissions of local (non-domain) source machine users (eg.
domain\administrator)
-fallback-group FALLBACK_GROUP
                        a group on the target machine to translate
the permissions of local (non-domain) source machine groups (eg.
domain\administrators)
-stats                  scan source and target trees in parallel and
compare tree statistics
-l                      detailed file listing output
-root                  verify acl for root directory

```

verify -v

Increase debug verbosity.

```

C:\XCP>xcp verify -v \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
308 compared, 0 same, 308 different, 0 missing, 5s
786 compared, 0 same, 786 different, 0 missing, 10s
--Truncated output ---
4,926 compared, 0 same, 4,926 different, 0 missing, 50s
149,640 compared, 0 same, 149,640 different, 0 missing, 12m46s
150,613 compared, 0 same, 150,613 different, 0 missing, 12m51s
151,495 compared, 0 same, 151,495 different, 0 missing, 12m56s
152,574 compared, 0 same, 152,574 different, 0 missing, 13m1s
153,536 compared, 0 same, 153,536 different, 0 missing, 13m6s
154,693 compared, 0 same, 154,693 different, 0 missing, 13m11s
155,194 compared, 0 same, 155,194 different, 0 missing, 13m16s
156,080 compared, 0 same, 156,080 different, 0 missing, 13m21s
157,139 compared, 0 same, 157,139 different, 0 missing, 13m26s
158,188 compared, 0 same, 158,188 different, 0 missing, 13m31s
159,210 compared, 0 same, 159,210 different, 0 missing, 13m36s
160,127 compared, 0 same, 160,127 different, 0 missing, 13m41s
161,196 compared, 0 same, 161,196 different, 0 missing, 13m46s
161,952 compared, 0 same, 161,952 different, 0 missing, 13m50s
Sending statistics...
C:\XCP>

```

verify -parallel <n>

Verifies with the number of concurrent processes (default: <cpu-count>).

Use the -parallel option to set a higher or lower number of XCP concurrent processes.

Note: The maximum value for n is 61.

```
C:\XCP>xcp verify -v \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
152,146 compared, 0 same, 152,146 different, 0 missing, 14m48s
152,802 compared, 0 same, 152,802 different, 0 missing, 14m53s
153,812 compared, 0 same, 153,812 different, 0 missing, 14m58s
154,775 compared, 0 same, 154,775 different, 0 missing, 15m3s
155,181 compared, 0 same, 155,181 different, 0 missing, 15m8s
155,965 compared, 0 same, 155,965 different, 0 missing, 15m13s
156,956 compared, 0 same, 156,956 different, 0 missing, 15m18s
157,830 compared, 0 same, 157,830 different, 0 missing, 15m23s
158,796 compared, 0 same, 158,796 different, 0 missing, 15m28s
159,704 compared, 0 same, 159,704 different, 0 missing, 15m33s
160,633 compared, 0 same, 160,633 different, 0 missing, 15m38s
161,521 compared, 0 same, 161,521 different, 0 missing, 15m43s
161,952 compared, 0 same, 161,952 different, 0 missing, 15m46s
Sending statistics...
C:\XCP>
```

verify -match <filter>

Scans the source and target tree and compares only the files or directories that match the filter argument. If there are any differences, it applies the required actions on the target to keep them in sync.

```
C:\XCP>xcp verify -match "'Microsoft' in name"
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
151 compared, 0 same, 151 different, 0 missing, 5s
490 compared, 0 same, 490 different, 0 missing, 10s
731 compared, 0 same, 731 different, 0 missing, 15s
2,038 compared, 0 same, 2,038 different, 0 missing, 20s
3,059 compared, 0 same, 3,059 different, 0 missing, 25s
4,280 compared, 0 same, 4,280 different, 0 missing, 30s
4,677 compared, 0 same, 4,677 different, 0 missing, 35s
4,680 compared, 0 same, 4,680 different, 0 missing, 40s
4,684 compared, 0 same, 4,684 different, 0 missing, 45s
4,710 compared, 0 same, 4,710 different, 0 missing, 50s
4,742 compared, 0 same, 4,742 different, 0 missing, 55s
4,767 compared, 0 same, 4,767 different, 0 missing, 1m0s
4,920 compared, 0 same, 4,920 different, 0 missing, 1m5s
4,936 compared, 0 same, 4,936 different, 0 missing, 1m10s
4,937 compared, 0 same, 4,937 different, 0 missing, 1m15s
4,938 compared, 0 same, 4,938 different, 0 missing, 1m20s
4,964 compared, 0 same, 4,964 different, 0 missing, 1m25s
5,153 compared, 0 same, 5,153 different, 0 missing, 1m30s
```

```

5,178 compared, 0 same, 5,178 different, 0 missing, 1m35s
5,255 compared, 0 same, 5,255 different, 0 missing, 1m40s
5,810 compared, 0 same, 5,810 different, 0 missing, 1m45s
6,025 compared, 0 same, 6,025 different, 0 missing, 1m50s
6,180 compared, 0 same, 6,180 different, 0 missing, 1m55s
6,211 compared, 0 same, 6,211 different, 0 missing, 2m0s
6,228 compared, 0 same, 6,228 different, 0 missing, 2m5s
6,231 compared, 0 same, 6,231 different, 0 missing, 2m10s
6,290 compared, 0 same, 6,290 different, 0 missing, 2m15s
6,354 compared, 0 same, 6,354 different, 0 missing, 2m16s
Sending statistics...
C:\XCP>

```

verify -preserve-atime

Resets the atime to the original value before XCP read the file.

```

C:\XCP>xcp verify -preserve-atime
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output --
151,793 compared, 0 same, 151,793 different, 0 missing, 19m55s
152,592 compared, 0 same, 152,592 different, 0 missing, 20m0s
153,261 compared, 0 same, 153,261 different, 0 missing, 20m5s
153,967 compared, 0 same, 153,967 different, 0 missing, 20m10s
154,787 compared, 0 same, 154,787 different, 0 missing, 20m15s
155,156 compared, 0 same, 155,156 different, 0 missing, 20m20s
155,637 compared, 0 same, 155,637 different, 0 missing, 20m25s
156,436 compared, 0 same, 156,436 different, 0 missing, 20m30s
157,185 compared, 0 same, 157,185 different, 0 missing, 20m35s
157,931 compared, 0 same, 157,931 different, 0 missing, 20m40s
158,689 compared, 0 same, 158,689 different, 0 missing, 20m45s
159,416 compared, 0 same, 159,416 different, 0 missing, 20m50s
160,055 compared, 0 same, 160,055 different, 0 missing, 20m55s
160,801 compared, 0 same, 160,801 different, 0 missing, 21m0s
161,503 compared, 0 same, 161,503 different, 0 missing, 21m5s
161,952 compared, 0 same, 161,952 different, 0 missing, 21m9s
Sending statistics...
36 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
C:\XCP>

```

verify -nodata

Do not compare data.

```

C:\XCP>xcp verify -nodata \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
----Truncated Output ---

```

```

151,069 compared, 0 same, 151,069 different, 0 missing, 8m40s
152,358 compared, 0 same, 152,358 different, 0 missing, 8m45s
153,759 compared, 0 same, 153,759 different, 0 missing, 8m50s
155,123 compared, 0 same, 155,123 different, 0 missing, 8m55s
156,511 compared, 0 same, 156,511 different, 0 missing, 9m0s
157,818 compared, 0 same, 157,818 different, 0 missing, 9m5s
159,210 compared, 0 same, 159,210 different, 0 missing, 9m10s
160,597 compared, 0 same, 160,597 different, 0 missing, 9m15s
161,952 compared, 0 same, 161,952 different, 0 missing, 9m19s
Sending statistics...
C:\XCP>

```

verify -noatime

Do not compare file access time stamps from the source to destination.

```

C:\XCP>xcp verify -noatime
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
650 compared, 650 same, 0 different, 0 missing, 5s
1,665 compared, 1,665 same, 0 different, 0 missing, 10s
2,798 compared, 2,798 same, 0 different, 0 missing, 12s
Sending statistics...
C:\XCP>

```

verify -noctime

Do not compare file creation time stamps from the source to destination.

```

C:\XCP>xcp verify -noctime
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
650 compared, 650 same, 0 different, 0 missing, 5s
1,665 compared, 1,665 same, 0 different, 0 missing, 10s
2,798 compared, 2,798 same, 0 different, 0 missing, 12s
Sending statistics...
C:\XCP>

```

verify -nomtime

Do not compare file modification time stamps from the source to destination.

```

C:\XCP>xcp verify -nomtime
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
650 compared, 650 same, 0 different, 0 missing, 5s
1,665 compared, 1,665 same, 0 different, 0 missing, 10s

```

```
2,798 compared, 2,798 same, 0 different, 0 missing, 12s
Sending statistics...
C:\XCP
```

verify -noattrs

Do not check attributes.

```
C:\XCP>xcp verify -noattrs
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
650 compared, 650 same, 0 different, 0 missing, 5s
1,665 compared, 1,665 same, 0 different, 0 missing, 10s
2,798 compared, 2,798 same, 0 different, 0 missing, 12s
Sending statistics...
C:\XCP
```

verify -noownership

Do not check ownership.

```
C:\XCP>xcp verify -noownership
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
650 compared, 650 same, 0 different, 0 missing, 5s
1,665 compared, 1,665 same, 0 different, 0 missing, 10s
2,798 compared, 2,798 same, 0 different, 0 missing, 12s
Sending statistics...
C:\XCP
```

verify -noacls

Do not check ACLs.

```
C:\XCP>xcp verify -noatime -noacls -noownership
\\10.61.77.189\vol_SMB_source_sushil\Microsoft.NET
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
371 compared, 371 same, 0 different, 0 missing, 5s
1,300 compared, 1,300 same, 0 different, 0 missing, 10s
2,798 compared, 2,798 same, 0 different, 0 missing, 13s
Sending statistics...
C:\XCP>
```

verify -atimewindow <float>

Specifies the acceptable difference, in seconds, for the atime of a file, from source to destination. XCP does not report files as being different if the difference in atime is less than <value>.

```

C:\XCP>xcp verify -atimewindow 600
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
152,214 compared, 0 same, 152,214 different, 0 missing, 12m55s
153,097 compared, 0 same, 153,097 different, 0 missing, 13m0s
154,273 compared, 0 same, 154,273 different, 0 missing, 13m5s
155,104 compared, 0 same, 155,104 different, 0 missing, 13m10s
155,735 compared, 0 same, 155,735 different, 0 missing, 13m15s
156,873 compared, 0 same, 156,873 different, 0 missing, 13m20s
157,895 compared, 0 same, 157,895 different, 0 missing, 13m25s
159,000 compared, 0 same, 159,000 different, 0 missing, 13m30s
159,919 compared, 0 same, 159,919 different, 0 missing, 13m35s
160,978 compared, 0 same, 160,978 different, 0 missing, 13m40s
161,845 compared, 0 same, 161,845 different, 0 missing, 13m45s
161,952 compared, 0 same, 161,952 different, 0 missing, 13m46s
Sending statistics...
C:\XCP>

```

Verify -ctimewindow <float>

Specifies the acceptable difference, in seconds, for the ctime of a file, from source to destination. So XCP does not report files as being different if the difference in ctime is less than <value>.

```

C:\XCP>xcp verify -ctimewindow 600
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
290 compared, 0 same, 290 different, 0 missing, 5s
-----Truncated Output -----
153,462 compared, 0 same, 153,462 different, 0 missing, 13m1s
154,675 compared, 0 same, 154,675 different, 0 missing, 13m6s
155,129 compared, 0 same, 155,129 different, 0 missing, 13m11s
155,850 compared, 0 same, 155,850 different, 0 missing, 13m16s
157,030 compared, 0 same, 157,030 different, 0 missing, 13m21s
157,983 compared, 0 same, 157,983 different, 0 missing, 13m26s
159,020 compared, 0 same, 159,020 different, 0 missing, 13m31s
159,962 compared, 0 same, 159,962 different, 0 missing, 13m36s
161,074 compared, 0 same, 161,074 different, 0 missing, 13m41s
161,915 compared, 0 same, 161,915 different, 0 missing, 13m46s
161,952 compared, 0 same, 161,952 different, 0 missing, 13m47s
Sending statistics...

```

verify -mtimewindow <float>

Specifies the acceptable difference, in seconds, for the mtime of a file, from source to destination. So XCP does not report files as being different if the difference in mtime is less than <value>.

```

C:\XCP>xcp verify -mtimewindow 600
\\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
----Truncated Output -----
151,879 compared, 0 same, 151,879 different, 0 missing, 12m46s
152,809 compared, 0 same, 152,809 different, 0 missing, 12m51s
153,854 compared, 0 same, 153,854 different, 0 missing, 12m56s
155,054 compared, 0 same, 155,054 different, 0 missing, 13m1s
155,408 compared, 0 same, 155,408 different, 0 missing, 13m6s
156,500 compared, 0 same, 156,500 different, 0 missing, 13m11s
39 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved.
157,556 compared, 0 same, 157,556 different, 0 missing, 13m16s
158,660 compared, 0 same, 158,660 different, 0 missing, 13m21s
159,671 compared, 0 same, 159,671 different, 0 missing, 13m26s
160,651 compared, 0 same, 160,651 different, 0 missing, 13m31s
161,606 compared, 0 same, 161,606 different, 0 missing, 13m36s
161,952 compared, 0 same, 161,952 different, 0 missing, 13m38s
Sending statistics...
C:\XCP>

```

verify -stats

Scans the source and the destination and prints a tree statistics report showing similarities or differences between the two shares.

```

C:\XCP>xcp verify -stats \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
-----Truncated Output -----
250,785 scanned, 0 errors, 4m33s
255,355 scanned, 0 errors, 4m38s
259,070 scanned, 0 errors, 4m43s
262,835 scanned, 0 errors, 4m48s
266,875 scanned, 0 errors, 4m53s
271,898 scanned, 0 errors, 4m58s
275,807 scanned, 0 errors, 5m3s
280,185 scanned, 0 errors, 5m8s
284,394 scanned, 0 errors, 5m13s
288,153 scanned, 0 errors, 5m18s
292,210 scanned, 0 errors, 5m23s
297,250 scanned, 0 errors, 5m28s
301,027 scanned, 0 errors, 5m33s
305,327 scanned, 0 errors, 5m38s
309,622 scanned, 0 errors, 5m43s
313,089 scanned, 0 errors, 5m48s
316,687 scanned, 0 errors, 5m53s
321,164 scanned, 0 errors, 5m58s
== Number of files ==

```



```

empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB
38 80299 36914 15665 2049 144 3
on-target same same same same same same same
on-source same same same same same same same
== Directory entries ==
empty 1-10 10-100 100-1K 1K-10K >10k
165 26012 615 37 8 3
on-target same same same same same same
on-source same same same same same same
== Depth ==
0-5 6-10 11-15 16-20 21-100 >100
159809 2143
on-target same same
on-source same same
== Modified ==
>1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future
92399 47119 22434
on-target same same same same
on-source same same same same
Total count: 161952 / same / same
Directories: 26840 / same / same
Regular files: 135112 / same / same
Symbolic links:
Junctions:
Special files:
323,905 scanned, 0 errors, 6m3s
Sending statistics...
C:\XCP>

```

verify -l

Lists the differences between files and directories on the source and destination.

In the following example, during copy, the ownership information was not transferred, and we can see the differences in the command output.

```

C:\XCP>xcp verify -l \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
---Truncated Output -----
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\MSXPSINC.GPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\LOCALE.GPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\P6FONT.GPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\MSXPSINC.PPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\P6DISP.GPD: Changed (ownership)

```

```

WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PCL4RES.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\MXDWDREV.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PCL5ERES.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PCLXL.GPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PJL.GPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PCLXL.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PCL5URES.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PJLMON.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PSCRIPT.HLP: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PS5UI.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PS_SCHM.GDL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PSCRIPT.NTF: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PSCRIPT5.DLL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\PSCRPTFE.NTF: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\STDNAMES.GPD: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\STDDTYPE.GDL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\STDSCHEM.GDL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\STDSCHEM.GDL: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfec
fc64d612e2fe\I386\TTFSUB.GPD: Changed (ownership)
WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d
83bb77377: Changed (ownership, dacl)
WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2ad
b339568b2a9: Changed (ownership, dacl)
WinSxS\x86_wsdapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992: Changed (ownership, dacl)
WinSxS: Changed (ownership, dacl)
<root>: Changed (ownership, dacl)
161,952 compared, 0 same, 161,952 different, 0 missing, 17m39s
Sending statistics...

```

```
C:\XCP>
```

verify -ll

Lists the detailed differences of the files or directories from the source and the target. The format is like git diff. The red value is the old one from the source, and the green value is the new one from the target.

```
C:\XCP>xcp verify -ll \\10.61.87.235\volxcp
\\10.216.50.212\xcp1_test1
XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp
Inc] until Mon Dec 31 00:00:00 2029
New folder: Changed (atime)
atime
- 2017-07-07 04:02:31 (1499425351.046407)
+ 2017-07-07 03:46:06 (1499424366.124829)
dir\diff-security.txt: Changed (ownership, dacl, sacl)
ownership
- BUILTIN\Administrators
+ DOMAIN\xcp
dacl (+1)
+ DOMAIN\xcp | ALLOWED/Full Control
sacl (-1)/(+1)
- DOMAIN/dan | AUDIT/Read
+ DOMAIN\xcp | AUDIT/Read
dir\diff-time.txt: Changed (mtime)
mtime
- 2017-07-07 03:56:00 (1499424960.390233)
+ 2017-07-07 03:59:16 (1499425156.698636)
dir\diff-attributes.txt: Changed (archive, hidden, normal,
readonly)
file attributes (-1)/(+3)
- NORMAL
+ ARCHIVE
+ HIDDEN
+ READONLY
dir\diff-content.txt: Changed (atime, mtime, content)
atime
- 2017-07-07 04:02:32 (1499425352.58743)
+ 2017-07-07 03:58:41 (1499425121.710766)
mtime
- 2017-07-07 03:58:07 (1499425087.996251)
+ 2017-07-07 03:58:41 (1499425121.710766)
dir: Changed (atime)
atime
- 2017-07-07 04:02:31 (1499425351.049407)
+ 2017-07-07 03:59:17 (1499425157.886634)
<root>: Changed (atime)
atime
- 2017-07-07 04:02:30 (1499425350.496398)
+ 2017-07-07 03:59:15 (1499425155.175642)
7 compared, 0 same, 7 different, 0 missing, 2s.
```

verify -fallback-user -fallback-group

The verify -fallback-user and -fallback-group commands lists the ACLS and ownership differences between files and directories on the source and destination

```
xcp verify -fallback-user "Domain\User1" -fallback-group  
"Domain\group1" <source> <target>
```

verify -noownership -fallback-user -fallback-group

The verify -noownership -fallback-user and -fallback-group commands lists the ACLS differences and skips verification of ownership between files and directories on the source and destination

```
xcp verify -noownership -fallback-user "Domain\User1" -fallback-  
group "Domain\group1" <source> <target>
```

verify -noacls -fallback-user -fallback-group

The verify -noacls -fallback-user and -fallback-group commands skip verification of ACLs and verify ownership between files and directories on the source and destination.

```
xcp verify -noacls -fallback-user "Domain\User1" -fallback-group  
"Domain\group1" <source> <target>
```

verify -noacls -noownership

The verify -noacls -fallback-user and -fallback-group commands skip verification of ACLs and verify ownership between files and directories on the source and destination.

```
xcp verify -noacls -noownership <source> <target>
```

XCP SMB Use Cases

This section provides the most common XCP SMB migration use cases.

How to Transition 7-Mode SMB Storage to ONTAP

This section covers the step-by-step procedure for transitioning a source 7-Mode SMB share to an ONTAP system.

NetApp assumes that the 7-Mode and ONTAP systems are SMB licensed. The destination SVM is created. The source and destination SMB shares are exported. XCP is installed and licensed.

Task Table 7) Transitioning 7-Mode SMB Storage to ONTAP.

✓	Step	Description
	1.	Scan the SMB shares for the files and directories. C:\Users\administrator.RTP2K8DOM\Desktop>xcp>xcp scan -stats \\10.61.77.189\performance_SMB_home_dirs

✓	Step	Description
		<p>XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>== Maximum Values ==</p> <p>Size Depth Namelen Dirsize</p> <p>15.6MiB 2 8 200</p> <p>== Average Values ==</p> <p>Size Depth Namelen Dirsize</p> <p>540KiB 2 7 81</p> <p>== Top File Extensions ==</p> <p>.txt .tmp</p> <p>5601 2200</p> <p>== Number of files ==</p> <p>empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB</p> <p>46 6301 700 302 200 252</p> <p>== Space used ==</p> <p>empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB</p> <p>0 6.80MiB 8.04MiB 120MiB 251MiB 3.64GiB 0</p> <p>== Directory entries ==</p> <p>empty 1-10 10-100 100-1K 1K-10K >10k</p> <p>18 1 77 1</p> <p>== Depth ==</p> <p>0-5 6-10 11-15 16-20 21-100 >100</p> <p>7898</p> <p>== Modified ==</p> <p>>1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future</p> <p>2167 56 322 5353</p> <p>== Created ==</p> <p>>1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future</p> <p>2171 54 373 5300</p> <p>Total count: 7898</p> <p>Directories: 97</p> <p>Regular files: 7801</p> <p>Symbolic links:</p> <p>Junctions:</p> <p>Special files:</p> <p>Total space for regular files: 4.02GiB</p> <p>Total space for directories: 0</p> <p>Total space used: 4.02GiB</p> <p>7,898 scanned, 0 errors, 0s</p>

✓	Step	Description
	2.	<p>Copy the files (with or without ACL) from the source to the destination SMB share. The following example shows a copy with ACL.</p> <pre>C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp copy -acl -fallback-user "DOMAIN\gabi" -fallback-group "DOMAIN\Group" \\10.61.77.189\performance_SMB_home_dirs \\10.61.77.56\performance_SMB_home_dirs XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 7,898 scanned, 0 errors, 0 skipped, 184 copied, 96.1MiB (19.2MiB/s), 5s 7,898 scanned, 0 errors, 0 skipped, 333 copied, 519MiB (84.7MiB/s), 10s 7,898 scanned, 0 errors, 0 skipped, 366 copied, 969MiB (89.9MiB/s), 15s 7,898 scanned, 0 errors, 0 skipped, 422 copied, 1.43GiB (99.8MiB/s), 20s 7,898 scanned, 0 errors, 0 skipped, 1,100 copied, 1.69GiB (52.9MiB/s), 25s 7,898 scanned, 0 errors, 0 skipped, 1,834 copied, 1.94GiB (50.4MiB/s), 30s 7,898 scanned, 0 errors, 0 skipped, 1,906 copied, 2.43GiB (100MiB/s), 35s 7,898 scanned, 0 errors, 0 skipped, 2,937 copied, 2.61GiB (36.6MiB/s), 40s 7,898 scanned, 0 errors, 0 skipped, 2,969 copied, 3.09GiB (100.0MiB/s), 45s 7,898 scanned, 0 errors, 0 skipped, 3,001 copied, 3.58GiB (100.0MiB/s), 50s 7,898 scanned, 0 errors, 0 skipped, 3,298 copied, 4.01GiB (88.0MiB/s), 55s 7,898 scanned, 0 errors, 0 skipped, 5,614 copied, 4.01GiB (679KiB/s), 1m0s 7,898 scanned, 0 errors, 0 skipped, 7,879 copied, 4.02GiB (445KiB/s), 1m5s 7,898 scanned, 0 errors, 0 skipped, 7,897 copied, 4.02GiB (63.2MiB/s), 1m5s</pre> <p>Note: If there is no data aggregate, create a new one using the storage aggr create command.</p>
	3.	<p>Sync the files on the source and destination.</p> <pre>C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync -acl -fallback-user "DOMAIN\gabi" -fallback-group "DOMAIN\Group" \\10.61.77.189\performance_SMB_home_dirs \\10.61.77.56\performance_SMB_home_dirs XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 10,796 scanned, 4,002 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 5s 15,796 scanned, 8,038 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10s 15,796 scanned, 8,505 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 15s 15,796 scanned, 8,707 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 20s 15,796 scanned, 8,730 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 25s 15,796 scanned, 8,749 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 30s 15,796 scanned, 8,765 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 35s 15,796 scanned, 8,786 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 40s 15,796 scanned, 8,956 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 45s 8 XCP v1.5 User Guide © 2019 NetApp, Inc. All rights reserved. Step Description 15,796 scanned, 9,320 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 50s</pre>

✓	Step	Description
		15,796 scanned, 9,339 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 55s 15,796 scanned, 9,363 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m0s 15,796 scanned, 10,019 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m5s 15,796 scanned, 10,042 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m10s 15,796 scanned, 10,059 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m15s 15,796 scanned, 10,075 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m20s 15,796 scanned, 10,091 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m25s 15,796 scanned, 10,108 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m30s 15,796 scanned, 10,929 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m35s 15,796 scanned, 12,443 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m40s 15,796 scanned, 13,963 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m45s 15,796 scanned, 15,488 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m50s 15,796 scanned, 15,796 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m51s
	4.	Verify that the files are copied correctly. C:\Users\administrator.RTP2K8DOM\Desktop\xcp> xcp verify \\10.61.77.189\performance_SMB_home_dirs \\10.61.77.56\performance_SMB_home_dir XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 8 compared, 8 same, 0 different, 0 missing, 5s 24 compared, 24 same, 0 different, 0 missing, 10s 41 compared, 41 same, 0 different, 0 missing, 15s 63 compared, 63 same, 0 different, 0 missing, 20s 86 compared, 86 same, 0 different, 0 missing, 25s 423 compared, 423 same, 0 different, 0 missing, 30s 691 compared, 691 same, 0 different, 0 missing, 35s 1,226 compared, 1,226 same, 0 different, 0 missing, 40s 1,524 compared, 1,524 same, 0 different, 0 missing, 45s 1,547 compared, 1,547 same, 0 different, 0 missing, 50s 1,564 compared, 1,564 same, 0 different, 0 missing, 55s 2,026 compared, 2,026 same, 0 different, 0 missing, 1m0s 2,045 compared, 2,045 same, 0 different, 0 missing, 1m5s 2,061 compared, 2,061 same, 0 different, 0 missing, 1m10s

✓	Step	Description
		2,081 compared, 2,081 same, 0 different, 0 missing, 1m15s 2,098 compared, 2,098 same, 0 different, 0 missing, 1m20s 2,116 compared, 2,116 same, 0 different, 0 missing, 1m25s 3,232 compared, 3,232 same, 0 different, 0 missing, 1m30s 4,817 compared, 4,817 same, 0 different, 0 missing, 1m35s 6,267 compared, 6,267 same, 0 different, 0 missing, 1m40s 7,844 compared, 7,844 same, 0 different, 0 missing, 1m45s 7,898 compared, 7,898 same, 0 different, 0 missing, 1m45s,cifs

How to Migrate CIFS Data with ACLs from a Source Storage Box to ONTAP

This section covers the step-by-step procedure for migrating CIFS data with security information from a source to a target ONTAP system

Task Table 8) Migrating CIFS data with ACLs from a source storage box to ONTAP.

✓	Step	Description
	1.	<p>Verify that the target ONTAP system is healthy.</p> <pre> C1_sti96-vsimsim-ucs540m_cluster::> cluster show Node Health Eligibility ----- sti96-vsimsim-ucs540m true true sti96-vsimsim-ucs540n true true 2 entries were displayed. C1_sti96-vsimsim-ucs540m_cluster::> node show Node Health Eligibility Uptime Model Owner Location ----- sti96-vsimsim-ucs540m true true 15 days 21:17 SIMBOX ahammed sti sti96-vsimsim-ucs540n true true 15 days 21:17 SIMBOX ahammed sti 2 entries were displayed. cluster::> storage failover show Takeover Node Partner Possible State Description ----- sti96-vsimsim-ucs540m sti96-vsimsim-ucs540n true Connected to sti96-vsimsim-ucs540n </pre>

✓	Step	Description																																																								
		sti96-vsim-ucs540n sti96-vsim- true Connected to sti96-vsim-ucs540m ucs540m 2 entries were displayed. C1_sti96-vsim-ucs540m_cluster::>																																																								
	2.	Verify that at least one non-root aggregate exists on the target system. The aggregate is normal. cluster::*> storage aggregate show <table><tr><th>Aggregate</th><th>Size</th><th>Available</th><th>Used%</th><th>State</th><th>#Vols</th><th>Nodes</th><th>RAID Status</th></tr><tr><td colspan="8">-----</td></tr><tr><td>aggr0_sti96_vsim_ucs540o</td><td>7.58GB</td><td>373.3MB</td><td>95%</td><td>online</td><td>1</td><td>sti96-vsim-ucs540o</td><td>raid_dp, normal</td></tr><tr><td>aggr0_sti96_vsim_ucs540p</td><td>7.58GB</td><td>373.3MB</td><td>95%</td><td>online</td><td>1</td><td>sti96-vsim-ucs540p</td><td>raid_dp, normal</td></tr><tr><td>aggr_001</td><td>103.7GB</td><td>93.63GB</td><td>10%</td><td>online</td><td>1</td><td>sti96-vsim-ucs540p</td><td>raid_dp, normal</td></tr><tr><td>sti96_vsim_ucs540o_aggr1</td><td>23.93GB</td><td>23.83GB</td><td>0%</td><td>online</td><td>1</td><td>sti96-vsim-ucs540o</td><td>raid_dp, normal</td></tr><tr><td>sti96_vsim_ucs540p_aggr1</td><td>23.93GB</td><td>23.93GB</td><td>0%</td><td>online</td><td>0</td><td>sti96-vsim-ucs540p</td><td>raid_dp, normal</td></tr></table> 5 entries were displayed. Note: If there is no data aggregate, create a new one using the storage aggr create command.	Aggregate	Size	Available	Used%	State	#Vols	Nodes	RAID Status	-----								aggr0_sti96_vsim_ucs540o	7.58GB	373.3MB	95%	online	1	sti96-vsim-ucs540o	raid_dp, normal	aggr0_sti96_vsim_ucs540p	7.58GB	373.3MB	95%	online	1	sti96-vsim-ucs540p	raid_dp, normal	aggr_001	103.7GB	93.63GB	10%	online	1	sti96-vsim-ucs540p	raid_dp, normal	sti96_vsim_ucs540o_aggr1	23.93GB	23.83GB	0%	online	1	sti96-vsim-ucs540o	raid_dp, normal	sti96_vsim_ucs540p_aggr1	23.93GB	23.93GB	0%	online	0	sti96-vsim-ucs540p	raid_dp, normal
Aggregate	Size	Available	Used%	State	#Vols	Nodes	RAID Status																																																			

aggr0_sti96_vsim_ucs540o	7.58GB	373.3MB	95%	online	1	sti96-vsim-ucs540o	raid_dp, normal																																																			
aggr0_sti96_vsim_ucs540p	7.58GB	373.3MB	95%	online	1	sti96-vsim-ucs540p	raid_dp, normal																																																			
aggr_001	103.7GB	93.63GB	10%	online	1	sti96-vsim-ucs540p	raid_dp, normal																																																			
sti96_vsim_ucs540o_aggr1	23.93GB	23.83GB	0%	online	1	sti96-vsim-ucs540o	raid_dp, normal																																																			
sti96_vsim_ucs540p_aggr1	23.93GB	23.93GB	0%	online	0	sti96-vsim-ucs540p	raid_dp, normal																																																			
	3.	Create an SVM on the target cluster system. cluster::*> vserver create -vserver vs1 -rootvolume root_vs1 -aggregate sti96_vsim_ucs540o_aggr1 -rootvolume-security-style mixed Verify the SVM was created. C2_sti96-vsim-ucs540o_cluster::*> vserver show -vserver vs1 Vserver: vs1 Vserver Type: data Vserver Subtype: default Vserver UUID: f8bc54be-d91b-11e9-b99c-005056a7e57e																																																								

✓	Step	Description																											
		<div>Root Volume: root_vs1</div> <div>Aggregate: sti96_vsim_ucs540o_aggr1</div> <div>NIS Domain: NSQA-RTP-NIS1</div> <div>Root Volume Security Style: mixed</div> <div>LDAP Client: esisconfig</div> <div>Default Volume Language Code: C.UTF-8</div> <div>Snapshot Policy: default</div> <div>Data Services: data-nfs, data-cifs, data-flexcache, data-iscsi</div> <div>Comment: vs1</div> <div>Quota Policy: default</div> <div>List of Aggregates Assigned: -</div> <div>Limit on Maximum Number of Volumes allowed: unlimited</div> <div>Vserver Admin State: running</div> <div>Vserver Operational State: running</div> <div>Vserver Operational State Stopped Reason: -</div> <div>Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp</div> <div>Disallowed Protocols: -</div> <div>Is Vserver with Infinite Volume: false</div> <div>QoS Policy Group: -</div> <div>Caching Policy Name: -</div> <div>Config Lock: false</div> <div>Volume Delete Retention Period: 0</div> <div>IPspace Name: Default</div> <div>Foreground Process: -</div> <div>Is Msid Preserved for DR: false</div> <div>Force start required to start Destination in muple IDP fan-out case: false</div> <div>Logical Space Reporting: false</div> <div>Logical Space Enforcement: false</div>																											
	4.	<div>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</div> <div>CLUSTER CLUSTER::> vol create -vserver vs1 -volume dest_vol -aggregate aggr_001 -size 150g type RW -state online -security-style ntfs</div>																											
	5.	<div>Create a data LIF to serve SMB client requests.</div> <div>CLUSTER::> network interface create -vserver vs1 -lif sti96-vsim-ucs540o_data1 -address 10.237.165.87 -netmask 255.255.240.0 -role data -data-protocol nfs,cifs -home-node sti96-vsim-ucs540o -home-port e0d</div> <div>Verify the LIF is successfully created.</div> <div>cluster::*> network interface show -vserver vs1</div> <table><tr><td></td><td>Logical</td><td>Status</td><td>Network</td><td>Current</td><td>Current Is</td><td></td><td></td><td></td></tr><tr><td>Vserver</td><td>Interface</td><td>Admin/Oper</td><td>Address/Mask</td><td>Node</td><td>Port</td><td>Home</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		Logical	Status	Network	Current	Current Is				Vserver	Interface	Admin/Oper	Address/Mask	Node	Port	Home											
	Logical	Status	Network	Current	Current Is																								
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port	Home																							

✓	Step	Description
		<pre> ----- vs1 sti96-vsim-ucs540o_data1 up/up 10.237.165.87/20 sti96-vsim-ucs540o e0d true </pre>
	6.	<p>Create a static route with the SVM if required</p> <pre>network route create -vserver dest -destination 0.0.0.0/0 -gateway 10.237.160.1</pre> <p>Verify the route is created</p> <pre>cluster::*> network route show -vserver vs1 Vserver Destination Gateway Metric ----- vs1 0.0.0.0/0 10.237.160.1 20 ::/0 fd20:8b1e:b255:9155::1 20 2 entries were displayed.</pre>
	7.	<p>Mount the target data volume in the SVM namespace.</p> <pre>CLUSTER::> volume mount -vserver vs1 -volume dest_vol -junction-path /dest_vol -active true</pre> <p>Verify the volume is successfully mounted</p> <pre>cluster::*> volume show -vserver vs1 -fields junction-path vserver volume junction-path ----- vs1 dest_vol /dest_vol vs1 root_vs1 / 2 entries were displayed.</pre> <p>Note: You can also specify volume mount options (junction path) with the volume create command.</p>
	8.	<p>Start the CIFS service on the target SVM.</p> <pre>cluster::*> vserver cifs start -vserver vs1</pre> <p>Warning: The admin status of the CIFS server for Vserver "vs1" is already "up".</p> <p>Verify the service is started and running</p> <pre>cluster::*></pre> <p>Verify the service is started and running</p>

✓	Step	Description																			
		<pre>C2_sti96-vs1m-ucs540o_cluster::*> cifs show</pre> <table><tr><th>Server</th><th>Status</th><th>Domain/Workgroup</th><th>Authentication</th></tr><tr><th>Vserver</th><th>Name</th><th>Admin</th><th>Name</th><th>Style</th></tr><tr><td colspan="5">-----</td></tr><tr><td>vs1</td><td>D60AB15C2AFC4D6</td><td>up</td><td>CTL</td><td>domain</td></tr></table>	Server	Status	Domain/Workgroup	Authentication	Vserver	Name	Admin	Name	Style	-----					vs1	D60AB15C2AFC4D6	up	CTL	domain
Server	Status	Domain/Workgroup	Authentication																		
Vserver	Name	Admin	Name	Style																	

vs1	D60AB15C2AFC4D6	up	CTL	domain																	
	9.	<p>Check that the default export policy is applied to the target SVM.</p> <pre>CLUSTER::> vserver export-policy show -vserver dest</pre> <table><tr><th>Vserver</th><th>Policy Name</th></tr><tr><td colspan="2">-----</td></tr><tr><td>dest</td><td>default</td></tr></table> <p>If required, create a new custom export policy for the target SVM.</p> <pre>CLUSTER::> vserver export-policy create -vserver vs1 -policyname xcpexport</pre>	Vserver	Policy Name	-----		dest	default													
Vserver	Policy Name																				

dest	default																				
	10.	<p>Modify the export policy rules to allow access to CIFS clients.</p> <pre>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</pre> <p>Verify the policy rules have modified.</p> <pre>cluster::*> export-policy rule show -instance</pre> <pre> Vserver: vs1 Policy Name: default Rule Index: 1 Access Protocol: any List of Client Match Hostnames, IP Addresses, Netgroups, or Domains: 0.0.0.0/0 RO Access Rule: any RW Access Rule: any User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: any Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true NTFS Unix Security Options: fail Vserver NTFS Unix Security Options: use_export_policy Change Ownership Mode: restricted Vserver Change Ownership Mode: use_export_policy Policy ID: 12884901889</pre> <pre> Vserver: vs1 Policy Name: default Rule Index: 2 Access Protocol: any</pre>																			

✓	Step	Description
		List of Client Match Hostnames, IP Addresses, Netgroups, or Domains: 0:0:0:0:0:0:0:0/0 RO Access Rule: any RW Access Rule: any User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: none Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true NTFS Unix Security Options: fail Vserver NTFS Unix Security Options: use_export_policy Change Ownership Mode: restricted Vserver Change Ownership Mode: use_export_policy Policy ID: 12884901889 2 entries were displayed.
	11.	Verify that the client is allowed access to the volume. cluster::*> export-policy check-access -vserver vs1 -volume dest_vol -client-ip 10.234.17.81 -authentication-method none -protocol cifs -access-type read-write Policy Policy Rule Path Policy Owner Owner Type Index Access ----- / default root_vs1 volume 1 read /dest_vol default dest_vol volume 1 read-write 2 entries were displayed.
	12.	Connect to the windows client system where XCP is installed. Browse to the XCP install path. C:\WRSHDNT>dir c:\netapp\xcp dir c:\netapp\xcp Volume in drive C has no label. Volume Serial Number is 5C04-C0C7 Directory of c:\netapp\xcp 09/18/2019 09:30 AM <DIR> . 09/18/2019 09:30 AM <DIR> .. 06/25/2019 06:27 AM 304 license 09/18/2019 09:30 AM <DIR> Logs 09/29/2019 08:45 PM 12,143,105 xcp.exe 2 File(s) 12,143,409 bytes 3 Dir(s) 29,219,549,184 bytes free
	13.	Query the source node SMB exports by running the xcp show command on the XCP windows client host system. C:\WRSHDNT>c:\netapp\xcp\xcp show \\10.237.165.71

✓	Step	Description
		<p>c:\netapp\xcp\xcp show \\10.237.165.71</p> <p>XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to Calin Salagean [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <pre> Shares Errors Server 6 0 10.237.165.71 == SMB Shares == Space Space Current Free Used Connections Share Path Folder Path 9.50GiB 4.57MiB 1 \\10.237.165.71\source_share C:\source_vol 94.3MiB 716KiB 0 \\10.237.165.71\ROOTSHARE C:\ 0 0 N/A \\10.237.165.71\ipc\$ N/A 94.3MiB 716KiB 0 \\10.237.165.71\c\$ C:\ == Attributes of SMB Shares == Share Types Remark source_share DISKTREE test share DISKTREE test_sh DISKTREE ROOTSHARE DISKTREE "\"Share mapped to top of Vserver global namespace, created bydeux_init \" ipc\$ PRINTQ,SPECIAL,IPC,DEVICE c\$ SPECIAL == Permissions of SMB Shares == Share Entity Type source_share Everyone Allow/Full Control ROOTSHARE Everyone Allow/Full Control ipc\$ Everyone Allow/Full Control c\$ Administrators Allow/Full Control/ </pre>
	14.	<p>Run help command for copy</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp help copy c:\netapp\xcp\xcp help copy XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to Calin Salagean [NetApp Inc] until Mon Dec 31 00:00:00 2029 usage: xcp copy [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-atime] [-acl] [-fallback-user FALLBACK_USER] [-fallback-group FALLBACK_GROUP] [-root] source target positional arguments: source target </pre>

✓	Step	Description
		<p>optional arguments:</p> <ul style="list-style-type: none"> -h, --help show this help message and exit -v increase debug verbosity -parallel <n> number of concurrent processes (default: <cpu-count>) -match <filter> only process files and directories that match the filter (see `xcp help -match` for details) -preserve-ctime restore last accessed date on source -acl copy security information -fallback-user FALLBACK_USER the name of the user on the target machine to receive the permissions of local (non-domain) source machine users (eg. domain\administrator) -fallback-group FALLBACK_GROUP the name of the group on the target machine to receive the permissions of local (non-domain) source machine groups (eg. domain\administrators) -root copy acl for root directory
	15.	<p>On the target ONTAP system, get the list of local user and local group names that you need to provide as values for the fallback-user and fallback-group arguments path.</p> <pre>cluster::*> local-user show (vserver cifs users-and-groups local-user show) Vserver User Name Full Name Description ----- vs1 D60AB15C2AFC4D6\Administrator Built-in administrator account C2_sti96-vsim-ucs540o_cluster::*> local-group show (vserver cifs users-and-groups local-group show) Vserver Group Name Description ----- vs1 BUILTIN\Administrators Built-in Administrators group vs1 BUILTIN\Backup Operators Backup Operators group vs1 BUILTIN\Guests Built-in Guests Group vs1 BUILTIN\Power Users Restricted administrative privileges vs1 BUILTIN\Users All users 5 entries were displayed</pre>
	16.	<p>Use xcp copy command with '-acl -fallback-user/group' options to migrate CIFS data with ACLs from the source to target.</p> <p>For fallback-user/group options you can specify any user/group that can be found in Active Directory or local user/group to target system.</p>

✓	Step	Description
		<p>C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share</p> <p>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share</p> <p>XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to Calin Salagean [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 8s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 13s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 18s ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 23s ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 28s 753 scanned, 0 errors, 0 skipped, 249 copied, 24.0KiB (4.82KiB/s), 33s 753 scanned, 0 errors, 0 skipped, 744 copied, 54.4KiB (6.07KiB/s), 38s 753 scanned, 0 errors, 0 skipped, 746 copied, 54.5KiB (20/s), 43s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (1.23KiB/s), 44s</p> <p>C:\WRSHDNT></p>
	17.	<p>If xcp copy results in the error message: 'ERROR failed to obtain fallback security principal', add the destination box in the hosts file (C:\Windows\System32\drivers\etc\hosts).</p>

✓	Step	Description
		<p>Netapp storage destination box entry should be in below format: <data vserver data interface ip> 1 or more white spaces <cifs server name></p> <pre> cluster::*> cifs show Server Status Domain/Workgroup Authentication Vserver Name Admin Name Style ----- vs1 D60AB15C2AFC4D6 up CTL domain C2_sti96-vsim-ucs540o_cluster::*> network interface show Logical Status Network Current Current Is Cluster sti96-vsim-ucs540p_clus1 up/up 192.168.148.136/24 sti96-vsim-ucs540p e0a true sti96-vsim-ucs540p_clus2 up/up 192.168.148.137/24 sti96-vsim-ucs540p e0b true vs1 sti96-vsim-ucs540o_data1 up/up 10.237.165.87/20 sti96-vsim-ucs540o e0d true sti96-vsim-ucs540o_data1_inet6 up/up fd20:8b1e:b255:9155::583/64 sti96-vsim-ucs540o e0d true sti96-vsim-ucs540o_data2 up/up 10.237.165.88/20 sti96-vsim-ucs540o e0e true 10.237.165.87 D60AB15C2AFC4D6 -> destination box entry to be added in hosts file. </pre>
	18.	<p>If you still get the error message 'ERROR failed to obtain fallback security principal' after adding the destination box entry in the hosts files, the user/group does not exist in the target system.</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\unknown_user -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\unknown_user - fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share </pre>

✓	Step	Description
		<p>XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to Calin Salagean [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6".</p> <p>ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6".</p> <p>ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6".</p> <p>ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6".</p> <p>753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 5s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 10s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 15s 753 scanned, 0 errors, 0 skipped, 284 copied, 27.6KiB (5.54KiB/s), 20s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (2.44KiB/s), 22s</p> <p>C:\WRSHDNT></p>
	19.	<p>Use xcp copy to migrate CIFs data with ACLs (with or without the root folder). Without the root folder:</p> <p>C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator - fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share</p> <p>XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to Calin Salagean [NetApp Inc] until Mon Dec 31 00:00:00 2029</p> <p>753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 5s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 10s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 15s 753 scanned, 0 errors, 0 skipped, 210 copied, 20.4KiB (4.08KiB/s), 20s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (2.38KiB/s), 22s</p> <p>C:\WRSHDNT></p> <p>With the root folder:</p>

✓	Step	Description
		C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -root -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -root -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share XCP SMB 1.5; (c) 2019 NetApp, Inc.; Licensed to Calin Salagean [NetApp Inc] until Mon Dec 31 00:00:00 2029 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 5s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 10s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 15s 753 scanned, 0 errors, 0 skipped, 243 copied, 23.6KiB (4.73KiB/s), 20s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (6.21KiB/s), 25s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 30s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 35s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 40s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 45s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 50s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 55s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 1m0s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 1m5s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (817/s), 1m8s C:\WRSHDNT>

Appendix

Sample XCP NFS Reports

XCP is a powerful tool. This tool can generate .csv and .html reports for NFS only, for scoping migration projects. Sample .html and .csv reports are shown below.

10.63.5.56:/vol/ex_s01 - report



Command scan 10.63.5.56:/vol/ex_s01

Options '-stats': True

Unreadable directories None Unreadable files None

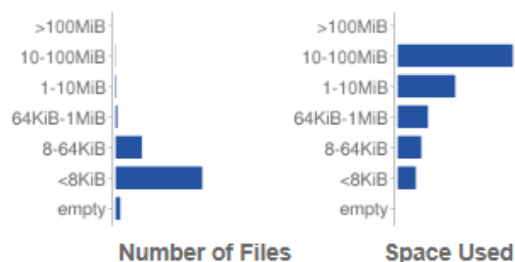
Filters: Unmatched None

Summary 6,034 scanned, 1.36 MiB in (2.15 MiB/s), 140 KiB out (221 KiB/s), 0s.

	Count	Used		Avg	Max
All File Types	6,034	213 MiB	Name Length	11	39
Regular Files	4,488	209 MiB	File Size	51.5 KiB	10.5 MiB
Directories	971	3.81 MiB	Directory Entries	6	198
Symlinks	354	12 KiB	File Depth	5	10
Specials	None	0			

daemon 9
root 891
20041 5,134

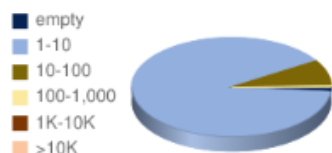
Top 5 File Owners



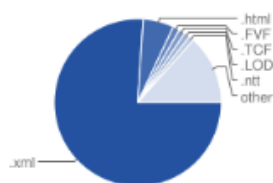
daemon 36 KiB
root 80.1 MiB
20041 132 MiB

Top 5 Space Users

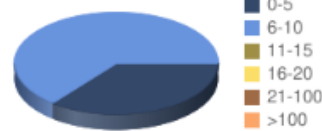
Dedupe Estimate N/A
Zero Blocks N/A
Hard Links 36.2 MiB
Extensions 47
Groups 3
Users 3



Directory Entries



Extension Types



File Depth



11-Jan-2019 04:23 AM EST

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xcp 1.4-17914d6

Troubleshooting XCP NFS Errors

XCP Error	Cause	Solution
-bash: ./xcp: Permission denied		Modify permissions using the chmod 755 command.
xcp: ERROR: This license has expired	This error occurs if the free 90-day XCP evaluation license expired.	Renew or obtain the new XCP license from http://xcp.netapp.com .
This copy is not licensed	XCP license is not activated.	Obtain the appropriate XCP license file. Copy the XCP license to the /opt/NetApp/xFiles/xcp/ directory on the XCP server. Run the xcp activate command to activate the license.
xcp: ERROR: XCP not activated, run 'activate' first	XCP license is not activated.	Download the XCP license from http://xcp.netapp.com . Copy the file on the XCP Linux client host at /opt/NetApp/xFiles/xcp / on the XCP server. Run the xcp activate command to activate the license.
xcp: ERROR: License file /opt/NetApp/xFiles/xcp/license not found	License file not found at /opt/NetApp/xFiles/xcp/ license.	Register for the XCP license at http://xcp.netapp.com . Download and copy the license file to /opt/NetApp/xFiles/xcp /license on the XCP Linux client host.
xcp: ERROR: Failed to activate license: Server unreachable		
xcp usage error: show: requires at least one server	Incomplete parameter specified for the xcp show command.	Rerun the command with server name or IP address specified. Correct syntax ./xcp

XCP Error	Cause	Solution
		show abc.nfsserver.com.
xcp: ERROR: show '10.61.73.94:/vol/nfsvol1': invalid hostname	Valid host name was not specified for the xcp show command.	Run the ./xcp show command with the valid host name. Exact command syntax ./xcp show 10.61.73.94 or ./xcp show localhost.
xcp usage error: scan: missing source path	Incomplete parameters specified for the xcp scan command.	To resolve this error, run the xcp scan command with the complete source NFSv3 export path. Correct syntax xcp scan <source NFS export path>.
xcp usage error: scan: invalid path '10.61.73.94'	Incomplete parameter specified for the xcp scan command.	Run the same command again by specifying the complete NFSv3 source export path.
xcp: ERROR: Catalog inaccessible: Cannot mount nfs_server:/export[:subdirectory]	Catalog path is not specified in the xcp.ini configuration file.	Open the editor on the XCP Linux client host and update the configuration file with the proper catalog location. The XCP config file is located at /opt/NetApp/xFiles/xcp /xcp.ini. Sample entries of config file. [root@localhost linux]# cat /opt/NetApp/xFiles/xcp /xcp.ini # Sample xcp config [xcp] catalog = 10.61.73.94:/vol/nfsvol1
xcp: compare1 'n.txt': ERROR: nfs3 LOOKUP 'n.txt' in '10.61.73.113:/target': nfs3 error 2: no such file or directory	Verify operation did not find the source file(s) on the target NFS export.	Run the xcp sync command to copy the incremental updates

XCP Error	Cause	Solution
		from source to destination.
xcp: ERROR: Failed to open catalog id '3': nfs3 LOOKUP '3' in '10.61.73.94:/vol/nfsvol1/catalog/indexes': nfs3 error 2: no such file or directory	XCP could not locate the specified catalog index number.	Verify the index number of the previous operation. To determine the exact catalog path, run the cat /opt/NetApp/xFiles/xcp/xcp.ini command. Catalog indexes are located in the <catalog path>:/catalog/indexes directory. After locating the index number, run the same command again by specifying the correct index number or name.
xcp: ERROR: Empty or invalid index '10.61.73.94:/vol/nfsvol1/catalog/indexes/2/2.index'	Previous copy operation was interrupted before indexing the files.	Run the xcp copy operation again by specifying the –newid option. Interrupt the copy operation when you see the message “indexed on console session.” 88,126 scanned, 42,058 copied, 41,469 indexed, 150MiB in (3.60 MiBps), 41.9MiB out (2.88MiBps), 16s
xcp: ERROR: compare batches: child process failed (exit code -9): recv <type 'exceptions.EOFError'>:	The exit code -9 means that the operating system (OS) issued a SIGKILL that stopped the XCP process. This might occur for various non-XCP OS related issues, the most common is that the system runs out of memory . Check the XCP logs for a warning if your system has less	Use a system that has enough free memory available. The minimum recommended amount of free memory is 4GB. However, more memory will help to avoid this issue. Use the command “free -m” to display the details of your system memory.

XCP Error	Cause	Solution
	than 4GB of free memory available.	
xcp: ERROR: For xcp to process ACLs, please mount 10.63.5.56:/vol1 using the OS nfs4 client	Source/target is not mounted on XCP host properly.	Mount the source/target on xcp host.

Troubleshooting XCP SMB Errors

XCP Error	Cause	Solution
xcp: ERROR: This license has expired	This error occurs if the free 90-day XCP evaluation license expired.	Renew or obtain the new XCP license from http://xcp.netapp.com .
This copy is not licensed	XCP license is not activated.	Obtain the appropriate XCP license file. Copy the XCP license to the c:\netapp\xcp folder on the XCP host. Run the xcp activate command to activate the license.
xcp: ERROR: XCP not activated, run 'activate' first	XCP license is not activated.	Download the XCP license from http://xcp.netapp.com . Copy the file on the XCP Linux client host at c:\netapp\xcp on the XCP host. Run the xcp activate command to activate the license.
xcp: ERROR: License file C:\NetApp\XCP\license not found	License file not found at C:\NetApp\XCP\license .	Register for the XCP license at http://xcp.netapp.com . Download and copy the license file to C:\NetApp\XCP\ on the XCP Windows client host.
xcp show: error: the following arguments are required: source	Incomplete parameter specified for the xcp show command.	Rerun the command with server name or IP address specified. Correct syntax: /xcp show \\server-name(ip).
Xcp scan Error: The network path was not found:	Incorrect server name or ip address	Rerun the command with correct server name or ip address
Xcp scan Error: The network name cannot be found	Incorrect share name	Rerun the command with correct share name
Xcp scan Error: The system cannot find the file specified	Missing server name or ip address	Rerun the command with server name/ip address

XCP Error	Cause	Solution
Xcp scan Error: The specified path is invalid	Missing share name	Rerun the command with complete server path
<p>Xcp copy Error: ERROR failed to obtain fallback security principal</p> <p>Error message logged in xcp.log file: pywintypes.error: (1722, 'LookupAccountName', 'The RPC server is unavailable.')</p>	Missing destination box entry in hosts files at the xcp host.	<p>Add the destination box in the hosts file (C:\Windows\System32\drivers\etc\hosts).</p> <p>Netapp storage destination box entry should be in below format:</p> <p><data vserver data interface ip> 1 or more white spaces <cifs server name></p>
<p>Xcp copy: ERROR failed to obtain fallback security principal (Post adding destination box entry in the hosts files)</p> <p>Error messaged logged in xcp.log file: 'No mapping between account names and security IDs was done'</p>	the fall back user/group does not exist at target system(destination box) or active directory	Rerun the command with correct fall back user/group options.
<p>Xcp copy: ERROR failed to obtain fallback security principal (Post adding destination box entry in the hosts files)</p> <p>Error messaged logged in xcp.log file: pywintypes.error: (87, 'LookupAccountName', 'The parameter is incorrect.')</p>	Incorrect parameter for fall back user/group option	Rerun the command with correct syntax for fall back user/group options.
Xcp copy with acl migration	user is facing issue related to security descriptors, because with privileges that migrations user owns,	add your migration user to "Manage audit & security log" policy in your Active Directory.

XCP Error	Cause	Solution
<p>Error message logged in xcp.log file: pywintypes.error: (1314, 'GetNamedSecurityInfo', 'A required privilege is not held by the client.')</p>	<p>XCP can only get owner, group, DACL, but it cannot get SACL.</p>	<p>Reference: https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-r2-and-2012/dn221953(v%3Dws.11)</p>

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