



User Guide

XCP SMB v1.1.1 Migration Tool User Guide

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Abstract

This document provides an overview of the XCP SMB migration tool and the various commands referenced.

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1 XCP SMB Migration Tool Overview

The NetApp® XCP SMB migration tool is a SMB host tool for fast and reliable third-party storage to NetApp migrations and NetApp to NetApp transitions. The tool also supports discovery, reporting, and a wide variety of sources and targets.

XCP SMB runs on a Windows host as a command-line tool. It is packaged as a single binary file that is easy to deploy and use. Users need to download and copy the binary on a supported Windows distribution.

XCP SMB has eight commands: `help`, `license`, `activate`, `show`, `scan`, `copy`, `sync`, and `verify`. Details about each command are provided in the Command Reference section.

1.1 System Requirements

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

Prerequisites

XCP SMB uses Windows client host systems to generate parallel I/O streams and fully utilize available network and storage performance. To support XCP SMB, each Windows client host requires:

- Windows 2008 R2 or above
- 64-bit Intel or AMD server, minimum 4 cores and 8GB RAM
- The Source storage system, XCP host, and the target ONTAP system must be part of same Active Directory domain
- 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
- Microsoft Visual C++ 2017 redistributable must be installed on the XCP host. The download link is [here](#)
- User login requirement:
 - **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.

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

License

NetApp offers a free 90-day renewable XCP license. You can obtain the license from <https://xcp.netapp.com>.

Software Download

You can download XCP from <https://xcp.netapp.com>. 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.

Supported Protocols

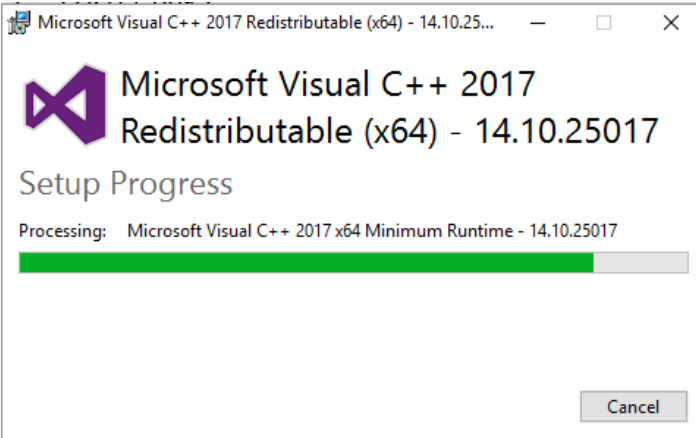
XCP SMB supports all SMB protocols that are supported by the Windows host.

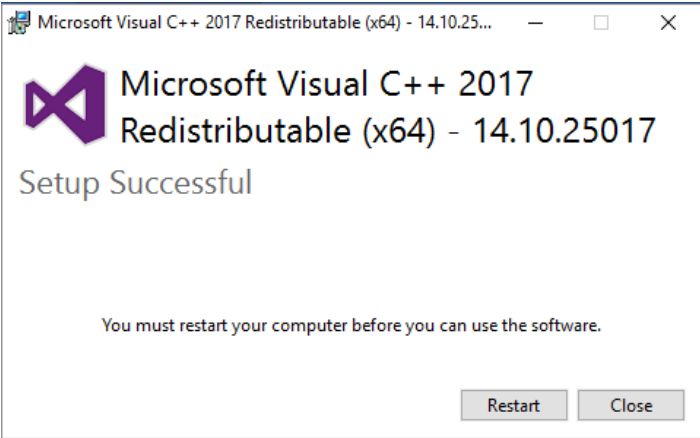
2 XCP SMB Installation

This chapter covers VC++ redistributable installation, license registration, downloading the XCP SMB binary, and initial setup.

Table 1 lists the steps for Microsoft VC++ redistributable installation.

Table 1) 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.	After the installation is complete, click Restart. 

Step	Action
	

2.1 Register and Download

This section provides the steps to register and download the license and binary for XCP SMB v1.1.1.

Table 2) Download and register.

Step	Action
1.	Go to https://xcp.netapp.com and download the latest version of XCP SMB v1.1.1.
2.	To generate the XCP license, go to https://xcp.netapp.com/ and log in through your NetApp Support ID or SSO. Note: For license, registrations, and software download assistance, contact XCP Support at ng-xcp-support@netapp.com .

2.2 Initial Setup

This section details the procedure for the initial setup of XCP SMB on a Windows host.

Table 3) XCP initial setup procedure.

Step	Action
1.	Copy the XCP SMB binary on a Windows host.
2.	On the Windows host, extract the archive.
3.	After extracting the archive, change the working directory to the location where the XCP binary is placed: for example, <C:\Users\administrator.domainname\Desktop\xcp>.
4.	Run the <code>xcp activate</code> command. An error message appears indicating that the license is not found and activated. <pre>[C:\Users\administrator.RTP2K8DOM\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</pre>
5.	Copy the downloaded license file to the Windows host at C:\NetApp\XCP.
6.	Verify that the license file was copied at C:\NetApp\XCP and run the XCP <code>activate</code> command to activate the XCP SMB license on this host. <pre>C:\Users\Administrator\Desktop\xcp>xcp activate</pre>

Step	Action
	XCP SMB 1.1.1-ed4b037; (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>
7.	Verify that the license error has disappeared and XCP SMB is licensed. C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp activate XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018 XCP already activated C:\Users\administrator.RTP2K8DOM\Desktop\xcp>

3 Sample SMB/CIFS Transition Scenario

This section provides a XCP migration scenario

How to Transition 7-Mode Storage to ONTAP

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

Note: 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.

Table 4) Transitioning 7-Mode SMB shares to ONTAP.

Step	Description
1.	Scan the SMB shares for the files and directories. <pre> C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp scan -stats \\10.61.77.189\performance_SMB_home_dirs XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018 == Maximum Values == Size Depth Namelen Dirsize 15.6MiB 2 8 200 == Average Values == Size Depth Namelen Dirsize 540KiB 2 7 81 == Top File Extensions == .txt .tmp 5601 2200 == Number of files == empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB 46 6301 700 302 200 252 </pre> <pre> == Space used == empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB 0 6.80MiB 8.04MiB 120MiB 251MiB 3.64GiB 0 </pre> <pre> == Directory entries == empty 1-10 10-100 100-1K 1K-10K >10k 18 1 77 1 </pre> <pre> == Depth == 0-5 6-10 11-15 16-20 21-100 >100 7898 </pre> <pre> == Modified == </pre>

Step	Description
	<pre> >1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future 2167 56 322 5353 == Created == >1 year >1 month 1-31 days 1-24 hrs <1 hour <15 mins future 2171 54 373 5300 Total count: 7898 Directories: 97 Regular files: 7801 Symbolic links: Junctions: Special files: Total space for regular files: 4.02GiB Total space for directories: 0 Total space used: 4.02GiB 7,898 scanned, 0 errors, 0s </pre>
2.	Copy the files with or without acl as desired from source to destination SMB share. Example shows copy with acl. <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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018 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>
3.	Sync the files on source and destination. <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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018 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 </pre>

Step	Description
	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
4.	Verify if the files are copied correctly. <pre>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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018</pre> 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 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

4 Command Reference

This section provides the list of available commands for the XCP tool. Each command has additional options and can be run with single or multiple options together to query the specific details.

Table 5) Command reference.

Feature	Description
"help"	Displays detailed information about available options for each XCP command.
"License"	Displays XCP license information.
"activate"	Activates XCP license on Windows host system.
"show"	Requests information from host about SMB shares.
"scan"	Reads all files and directories found on a SMB share.
"copy"	Recursively copies everything from source to destination.
"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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

4.1 The help Command

The help command displays a list of commands, command options, and a brief description of each of the commands. The command is useful for beginners and new to the XCP data migration tool.

Syntax

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

Example

```
C:\Users\Administrator\Desktop\xcp>xcp --help
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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
```

Options

The following table describes the help options.

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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
usage: xcp sync [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-ptime]
               [-nodata] [-noptime] [-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-ptime       restore last accessed date on source
  -nodata               do not check data
  -noptime              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
C:\Users\Administrator\Desktop\xcp>
```

4.2 The license Command

The license can be downloaded from <https://xcp.netapp.com>. Select the type of license you want to request. The options available 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, which 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 just 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.

Syntax

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

Example

```
C:\Users\Administrator\Desktop\xcp>xcp license
XCP SMB 1.1.1-ed4b037; (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.com
```

4.3 The activate Command

The `activate` command activates the XCP license on the host it currently runs. 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 Licesne .
```

Example

```
C:\Users\Administrator\Desktop\xcp>xcp activate
XCP SMB 1.1.1-ed4b037; (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>
```

4.4 The show Command

The `show` command queries the SMB shares of the storage server. The command lists the available shares with the used and free capacity of each share followed by its attributes and permission.

Syntax

The `show` command requires the host name or IP address of the SMB server.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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
```

47.8GiB 167MiB 1	\\10.61.87.235\volxcp	C:\vol\volxcp
9.50GiB 512KiB 1	\\10.61.87.235\jl	C:\vol\jl
== 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
jl	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

Options

The following table describes the `show` options.

Feature	Description
<code>show -v</code>	Increase debug verbosity. Print verbose details about SMB servers using the IP address or host name.
<code>show -h, --help</code>	Show this help message and exit.

4.5 The scan Command

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 SMB 1.1.1-ed4b037; (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>
```

Options

The following table lists `scan` options and their description.

Feature	Description
<code>scan -h, --help</code>	Show this help message and exit.

Feature	Description
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 (see `xcp help -match` for details).
scan -preserve-ctime	Restore last accessed date on source.
scan -depth <n>	Limit the search depth to n levels.
scan -stats	Print tree statistics report.
scan -l	Detailed file listing output.
scan -ownership	Retrieve ownership information of files and directories on the source system.
scan -du	Summarize space usage of each directory, including subdirectories and files.
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 the scan command can be used.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp scan --help
XCP SMB 1.1.1-ed4b037; (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-ctime]
               [-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-ctime       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 SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018

---Truncated Output ---
```

```

vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none_d49e6af338225fe5\
structuredQuery.dll
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb77377
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none_d49e6af338225fe5
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9\Presentatio
nHostProxy.dll
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992\wsapi.dll.mui
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\s
peech-synthesis.xsd
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\s
ynthesis-core.xsd
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\W
indows.Media.SpeechSynthesis.dll
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_31bf3856ad364e35_6.3.9600.17415_none_148a01188942cbc3\x
ml.xsd
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992
vol_SMB_source_sushil\WinSxS\x86_windows-media-speechsynthesis-
winrt_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>

The scan -parallel command can be used to set a higher or lower number of XCP concurrent processes. This can be adjusted appropriately, taking into consideration the performance of the host XCP machine (CPU, memory, network bandwidth, and so on).

Note: The maximum value for n is 61.

```

C:\XCP>xcp scan -parallel 8 \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (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.Resources.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\acspecfc.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.Resources.dll
vol_SMB_source_sushil\ADFS\cs\Microsoft.IdentityServer.Web.Resources.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_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992
vol_SMB_source_sushil\WinSxS
vol_SMB_source_sushil

161,951 scanned, 0 errors, 3m1s

```

```
Sending statistics...
```

```
C:\XCP>
```

scan -fmt <expression>

The `scan -fmt` command formats file listing according to the defined expression.

The `-fmt` command uses the Python formatter syntax. More examples can be seen using “`xcp help -fmt`.”

In the following example, the formatter is set to output a CSV, including relative path, name, size, and depth of the file.

```
C:\XCP>xcp scan -fmt "'", '.join(map(str, [relpath, name, size, depth]))'
\\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
---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_d49b7b2b382502ca,
x86_windowssearchengine-structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b382502ca,
0, 2
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992\wsapi.dll.mui, wsd
api.dll.mui, 2048, 3
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_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...
```

scan -match

The `scan -match` command is used to only process files and directories that match the filter. See `xcp help -match` for details.

In the following example, the `scan` command is used to scan any file that has changed between 1 month and 1 year and print a line to the console for each file that is found. The details that are printed for each file are the ISO format of its last modification time, a human-readable size of the file, its type, and its relative path.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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>
```

The following example is for `scan` with `-match` and lists the files that have not been modified for more than 3 months and have a size bigger than 4MB. The details that are printed for each file are the ISO format of its last modification time, a human-readable size of the file, its type, and its relative path.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
----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>
```

This 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018

-----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_windowssearchengine-
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.resources_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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
Sending statistics...

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

This 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
\\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
```

```

\\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.ttf   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-ctime

The `scan -preserve-ctime` command 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 `ctime` on read), because XCP is reading the files one by one.

XCP never changes the `ctime`. It is the storage system that changes if it is configured. XCP just reads the file, which triggers an update on `ctime`.

By using the `-preserve-ctime` option, XCP goes back at each file and resets the `ctime` to the original value before the file was read.

```

C:\XCP>xcp scan -preserve-ctime \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
----Truncated Output ----
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none_d49e6af338225fe5
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none_d49b7b2b382502ca
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb77377
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9\Presentatio
nHostProxy.dll
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992_wsapi.dll.mui
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_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 -depth <n>

The `scan -depth` command used with the `-depth <n>` option can limit the search depth of directories inside a SMB share.

In the following example, the search depth is limited to level 2.

```

C:\XCP>xcp scan -depth 2 \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
----Truncated Output ----
vol_SMB_source_sushil\WinSxS\x86_windows-storage-compression-
winrt_31bf3856ad364e35_6.3.9600.16384_none_76e0a28986080ad4

```

```

vol_SMB_source_sushil\WinSxS\x86_windows-storage-compression-
winrt_31bf3856ad364e35_6.3.9600.17415_none_772d3d6585ce775c
vol_SMB_source_sushil\WinSxS\x86_windowssearchcomponent_31bf3856ad364e35_6.3.9600.16384_none_6
e5dccc624ee39dcd
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_d49b7b2b382502ca
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17415_none_d4b523c3381124e0
vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none_d49e6af338225fe5
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb77377
vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992
vol_SMB_source_sushil\WinSxS
vol_SMB_source_sushil

30,653 scanned, 0 errors, 31s
Sending statistics...

```

The scan -stats

The `xcp scan` command used with the `-stats` option outputs at the end of the scan a tree statistics report. The tree report contains maximum values, average values, top file extension number of files, space used, directories entries, depth, and modified and creation time stamp.

It also lists the total count of files, directories, regular files, symbolic links, junctions, and special file count.

```

C:\XCP>xcp scan -stats \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (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

```

```

== 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...

C:\XCP>

```

scan -l

The `scan -l` command is used for detailed file listing output.

This output lists files represented as `f` and directories as `d` and their size, share name, and file name. It gives a detailed file listing output.

```

C:\XCP>xcp scan -l \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (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_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none
_d49b7b2b382502ca\StructuredQuery.dll
f   492KiB   1y72d vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none
_d49e6af338225fe5\StructuredQuery.dll
f   71.1KiB  154d15h vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17415_none
_d4b523c3381124e0\StructuredQuery.dll
f   31.6KiB  154d15h vol_SMB_source_sushil\WinSxS\x86_windows-storage-applicationdata-
winrt_31bf3856ad364e35_6.3.9600.16384_no
ne_7910a646f21d8fb4\Windows.Storage.ApplicationData.dll
f   234KiB   3y331d vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb
77377\PresentationHost.exe
d         0  154d15h vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17031_none
_d49b7b2b382502ca
d         0   6d17h vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.18334_none
_d49e6af338225fe5
d         0  154d15h vol_SMB_source_sushil\WinSxS\x86_windowssearchengine-
structuredquery_31bf3856ad364e35_7.0.9600.17415_none
_d4b523c3381124e0
d         0  154d15h vol_SMB_source_sushil\WinSxS\x86_windows-storage-applicationdata-
winrt_31bf3856ad364e35_6.3.9600.16384_no
ne_7910a646f21d8fb4
d         0   6d17h vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb
77377
f   45.5KiB   3y331d vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339
568b2a9\PresentationHostProxy.dll
f         2KiB   3y291d
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992\
wsapi.dll.mui
d         0   6d17h
vol_SMB_source_sushil\WinSxS\x86_wsapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992
d         0   6d17h vol_SMB_source_sushil\WinSxS
d         0   6d17h vol_SMB_source_sushil

```

```
161,951 scanned, 0 errors, 3m16s
Sending statistics...

C:\XCP>
```

scan -ownership

The `scan -ownership` command is used to retrieve ownership information for files.

This command lists the files and directories in a share and their respective owners. The owners can be local or domain users or built-in accounts.

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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----Truncated output -----
f DOMAIN\kumar_sushil      2KiB  3y291d
vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e35_6.3.9600.16384_en-
us_afd9853581041992\wsdapi.dll.mui
d DOMAIN\kumar_sushil      0      6d17h
vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e35_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

The `scan -du` command summarizes space usage of each directory, including subdirectories.

This command scans the share and lists the files and directories and their respective sizes.

```
C:\XCP>xcp scan -du \\10.61.77.189\vol_SMB_source_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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_31bf3856ad364e35_6.3.9600.16384_none_6
e5dcc624ee39dcd
 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_0493f7d83bb77377
 45.5KiB vol_SMB_source_sushil\WinSxS\x86_wpf-
presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9
 2KiB vol_SMB_source_sushil\WinSxS\x86_wsdapi.resources_31bf3856ad364e35_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>
```

4.6 The copy Command

The `copy` command scans and copies the entire source directory structure to a destination SMB share. The `xcp copy` command requires two positional arguments. The first one is the source path, and the second one is the target path.

The scanned and copied files, throughput or speed, and elapsed time details are printed to the console once every 5 seconds. The runtime 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

In the following example, 161,952 files are on the source share. These files are scanned on the source and copied on the destination share. There is a difference of 1 file between what XCP SMB scans and what it copies to the target; that is the root directory. The difference is considered normal behavior.

```
C:\XCP>xcp copy \\10.61.77.189\vol_SMB_source_sushil \\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
-----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>
```

Options

The following table provides a list of `copy` options and their descriptions.

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

copy --help

This option displays detailed information about how the `copy` command can be used.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp copy --help
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
usage: xcp copy [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-atime]
               [-acl] [-fallback-user FALLBACK_USER]
               [-fallback-group FALLBACK_GROUP]
               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-atime       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)
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

copy -v

The `copy -v` command is for verbose logging. This helps with logging detailed information and in debugging in case errors or warnings are reported.

```
C:\XCP>xcp copy -v \\10.61.77.189\vol_SMB_source_sushil\warning
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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.log'
ERROR failed to copy "pyshellext.amd64.dll": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\pyshellext.amd64.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.Manifest'
ERROR failed to copy "WindowsUpdate.log": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\WindowsUpdate.log'
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
```

```
Sending statistics...
```

```
C:\XCP>
```

copy -parallel <n>

The `-parallel` option can be used to set a higher or lower number of XCP concurrent processes. This can be adjusted appropriately, taking into consideration the performance of the host XCP machine (CPU, memory, network bandwidth, and so on). 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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>

The `copy -match` command copies only the data that matches the argument passed. In the following example, only the files or directories that have the string "Microsoft" in their name are copied.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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-ctime

XCP never changes the `ctime`. However, if the storage system is configured to change the access time of a file when a client reads it, then all the files that XCP reads recursively have their `ctime` updated to now.

By using the `-preserve-ctime` option, XCP goes back at each file and resets the `ctime` to the original value before the file was read.

```
C:\Users\administrator.RTP2K8DOM\Desktop\>xcp>xcp copy -preserve-ctime \\10.61.87.235\volxcp
\\10.216.50.212\>xcp1_test1
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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

The `-acl` option activates the transfer of the security descriptors (ACLs). A copy with `-acl` transfers the data, the file attributes, the ownership, and the ACLs of all the files.

The option is used together 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.

4.7 The sync Command

The XCP `sync` command scans the source and the target shares in parallel, and if any differences are detected, XCP 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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>
```

Options

The following table lists the `sync` options and their description.

Feature	Description
<code>sync -h, --help</code>	Show this help message and exit.
<code>sync -v</code>	Increase debug verbosity.
<code>sync -parallel <n></code>	Number of concurrent processes (default: <code><cpu-count></code>).
<code>sync -match <filter></code>	Only process files and directories that match the filter (see <code>`xcp help -match`</code> for details).
<code>sync -preserve-ctime</code>	Restore last accessed date on source.
<code>sync -nodata</code>	Do not check data.
<code>sync -noatime</code>	Do not check file access time.

Feature	Description
<code>sync -noctime</code>	Do not check file creation time.
<code>sync -nomtime</code>	Do not check file modification time.
<code>sync -noattrs</code>	Do not check attributes.
<code>sync -noownership</code>	Do not check ownership.
<code>sync -atimewindow <float></code>	Acceptable access time difference, in seconds.
<code>sync -ctimewindow <float></code>	Acceptable creation time difference, in seconds.
<code>sync -mtimewindow <float></code>	Acceptable modification time difference, in seconds,
<code>sync -acl</code>	Copy security information,
<code>sync -fallback-user FALLBACK_USER</code>	User on the target machine to receive the permissions of local (nondomain) source machine users (example: domain\administrator),
<code>sync -fallback-group FALLBACK_GROUP</code>	Group on the target machine to receive the permissions of local (nondomain) source machine groups (example: domain\administrators),
<code>sync -l</code>	Increase output detail,

sync --help

This option displays detailed information about how the `sync` command can be used.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp help sync
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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-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
  -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
```

sync -v

The `sync -v` command does the verbose logging. This helps log detailed information and in debugging in case errors are reported.

```
C:\XCP>xcp sync -v \\10.61.77.189\vol_SMB_source_sushil\warning
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
ERROR failed to remove from target
"assembly\GAC_32\Microsoft.CertificateServices.PKIClient.Cmdlets\v4.0_6.3.0.0__31bf3856ad364e3
5\pki.psdl": [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__31bf385
6ad364e35\pki.psdl'
ERROR failed to remove from target
"assembly\GAC_64\Microsoft.GroupPolicy.AdmTplEditor\v4.0_6.3.0.0__31bf3856ad364e35\Microsoft.
GroupPolicy.AdmTplEditor.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.
77.56\\vol_SMB_target_sushil\\assembly\GAC_64\Microsoft.GroupPolicy.AdmTplEditor\v4.0_6.3.0.0__3
1bf3856ad364e35\Microsoft.GroupPolicy.AdmTplEditor.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.Printing.dll'
ERROR failed to remove from target
"assembly\GAC_MSIL\Microsoft.PowerShell.Workflow.ServiceCore\v4.0_3.0.0.0__31bf3856ad364e35\Mi
crosoft.PowerShell.Workflow.ServiceCore.dll": [Errno 13] Access is denied: '\\\\
\\10.61.77.56\\vol_SMB_target_sushil\\assembly\GAC_MSIL\Microsoft.PowerShell.Workflow.Servic
eCore\v4.0_3.0.0.0__31bf3856ad364e35\Microsoft.PowerShell.Workflow.ServiceCore.dll'
ERROR failed to remove from target
"assembly\GAC_MSIL\Microsoft.RightsManagementServices.ServerManager.DeploymentPlugin\v4.0_6.3.
0.0__31bf3856ad364e35\Microsoft.RightsManagementServices.ServerManager.Deploymen
n.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_sushil\\assembly\GAC_MSIL\Microsoft.RightsManagemen
tServices.ServerManager.DeploymentPlugin\v4.0_6.3.0.0__31bf3856ad364e35\Mic
rosoft.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.M
anagement.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\Micro
soft.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\
GAC_MSIL\PresentationUI\v4.0_4.0.0.0__31bf3856ad364e35\PresentationUI.dll'
ERROR failed to remove from target
"assembly\GAC_MSIL\System.IO.Compression.FileSystem\v4.0_4.0.0.0__b77a5c561934e089\System.IO.C
ompression.FileSystem.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.71.5
6\\vol_SMB_target_sushil\\assembly\GAC_MSIL\System.IO.Compression.FileSystem\v4.0_4.0.0.0__b77a5c
561934e089\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.Identi
tyModel.Selectors.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\v
s_target_sushil\\assembly\GAC_MSIL\System.IdentityModel.Selectors\v4.0_4.0.0.0__b77a5c56193
4e089\System.IdentityModel.Selectors.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__31bf3856ad364e35\System.Web.Data
Visualization.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\vol_c
rget_sushil\\assembly\GAC_MSIL\System.Web.DataVisualization\v4.0_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>

The `-parallel` option can be used to set a higher or lower number of XCP concurrent processes. This can be adjusted appropriately, taking into consideration the performance of the host XCP machine (CPU, memory, network bandwidth, and so on).

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

In the following example, the value for n is 5.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync -parallel 5 \\10.61.87.235\volxcp
\\10.216.50.212\xcp1_test1
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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>

The `sync -match` command 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.

In this example, we filter and sync only the files and directories that have "Microsoft" in their name.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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

XCP never changes the `ctime`. However, if the storage system is configured to change the access time of a file when a client reads it, then all the files that XCP reads recursively have their `ctime` updated to now.

Note: By using the `-preserve-ctime` option, XCP goes back at each file and resets the `ctime` to the original value before the file was read.

```
C:\XCP>xcp sync -preserve-ctime \\10.61.77.189\vol_SMB_source_sushil\Microsoft.net
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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

The `sync -nodata` option is used when we want to skip comparing the files content. This command syncs the source and destination without comparing the contents of the file.

If a file changes its content on the source, it usually changes the size and the `mtime` as well. So this option is in general a safe performance enhancement.

```

C:\XCP>xcp sync -nodata \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
----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

The `sync -noatime` command syncs all the differences of the source to the target, but it ignores files that only have differences in access time.

Note: Access time shows the last time the file was accessed.

```

C:\XCP>xcp sync -noatime \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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

The `sync -noctime` command 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
----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

The `sync -nomtime` command 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018

```

```

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

The `sync -noattrs` command syncs all the differences of the source to the target, but it ignores files that only have differences in file attributes. In other words, a file is recopied only if it has a different content. If different, the ACLs are still transferred.

```

C:\XCP>xcp sync -noattrs \\10.61.77.189\vol_SMB_source_sushil\
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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

The `sync -noownership` command 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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. So 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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>.

```
In the example below, XCP will accept a difference in ctime for up to 10 minutes between the
source and the destination files, and it will not update the ctime on the target.C:\XCP>xcp
sync -ctimewindow 600 \\10.61.77.189\vol_SMB_source_sushil \\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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>.

In the example below, XCP will accept a difference in mtime for up to 10 minutes between the source and the destination files, and it will not update the mtime on the target. C:\XCP>xcp sync -mtimewindow 600 \\10.61.77.189\vol_SMB_source_sushil \\10.61.77.56\vol_SMB_target_sushil XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018

-----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 along with the security information from the source and 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: The -acl option cannot be used without -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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon Apr 2 23:39:34 2018

```
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

The sync -l provides detailed logging information in the standard output of all the actions that are performed by XCP on the target: for example, copy a new file, set attributes, set time stamps, and so on.

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp sync -l \\10.61.87.235\volxcp \\10.216.50.212\xcp1_test1

```

XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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>

```

4.8 The verify Command

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

Verification is done on file attributes, ownership, ACLs, and data.

There are verification options, such as `-nodata` and `-noatime`, that exclude from the comparison certain parts of a file.

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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018

16 compared, 0 same, 1 different, 15 missing, 1s
Sending statistics...

C:\Users\administrator.RTP2K8DOM\Desktop\xcp>

```

Options

The following table lists the `verify` options and their descriptions.

Feature	Description
<code>verify -h, --help</code>	Show this help message and exit.
<code>verify -v</code>	Increase debug verbosity.
<code>verify -parallel <n></code>	Number of concurrent processes (default: <cpu-count>).

Feature	Description
<code>verify -match <filter></code>	Only process files and directories that match the filter (see <code>`xcp help -match`</code> for details).
<code>verify -preserve-ctime</code>	Restore last accessed date on source.
<code>verify -nodata</code>	Do not check data.
<code>verify -noatime</code>	Do not check file access time.
<code>verify -noctime</code>	Do not check file creation time.
<code>verify -nomtime</code>	Do not check file modification time.
<code>verify -noattrs</code>	Do not check attributes.
<code>verify -noownership</code>	Do not check ownership.
<code>verify -noacls</code>	Do not check acls.
<code>verify -atimewindow <float></code>	Acceptable access time difference, in seconds.
<code>verify -ctimewindow <float></code>	Acceptable creation time difference, in seconds.
<code>verify -mtimewindow <float></code>	Acceptable modification time difference, in seconds.
<code>verify -stats</code>	Scan source and target trees in parallel and compare tree statistics.
<code>verify -l</code>	Detailed file listing output.

verify --help

This option displays detailed information about how the `verify` command can be used.

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>xcp verify --help
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
usage: xcp verify [-h] [-v] [-parallel <n>] [-match <filter>]
                [-preserve-ctime] [-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-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
  -noacls               do not check acls
  -atimewindow <float> acceptable access time difference in seconds
  -ctimewindow <float> acceptable creation time difference in seconds
```

```
-mtimewindow <float> acceptable modification time difference in seconds
-stats scan source and target trees in parallel and compare tree statistics
-l detailed file listing output
```

```
C:\Users\administrator.RTP2K8DOM\Desktop\xcp>
```

verify -v

The `verify -v` command is used for verbose logging. This logging mode helps in debug information in case an error or warning is reported. This option is used for detailed log collection.

```
C:\XCP>xcp verify -v \\10.61.77.189\vol_SMB_source_sushil \\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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>

The `verify -parallel <n>` command verifies with the number of concurrent processes (default: <cpu-count>).

The `-parallel` option can be used to set a higher or lower number of XCP concurrent processes. This can be adjusted appropriately, taking into consideration the performance of the host XCP machine (CPU, memory, network bandwidth, and so on).

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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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>

The verify with `-match` option 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.

In this example, we filter and verify everything that has "Microsoft" in the name.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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-ctime

XCP never changes the `ctime`. However, if the storage system is configured to change the access time of a file when a client reads it, then all the files that XCP reads recursively have their `ctime` updated to now.

By using the `-preserve-ctime` option, XCP goes back at each file and resets the `ctime` to the original value before the file was read.

```
C:\XCP>xcp verify -preserve-ctime \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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...
```

```
C:\XCP>
```

verify -nodata

The `verify -nodata` command does not compare the contents of the files between the source and the target shares.

```
C:\XCP>xcp verify -nodata \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
----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

The `verify` command, used with the `-noatime` option, skips comparing 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018

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

The `verify` command, used with the `-noctime` option, skips comparing 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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

The `verify` command, used with the `-nomtime` option, skips comparing 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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

The `verify` command, used with the `-noattrs` option, skips comparing file attributes from the source to destination (hidden, archived, and so on).

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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

The `verify` command, used with the `-noownership` option, skips comparing file ownership from source to destination.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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

In the following example, the security information on the source is different than that of the target. Using the `verify -noacls` option, we are skipping security checks. `-noatime` is to skip the atime difference, and `-noownership` is to skip the ownership information differences.

```
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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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>
```

In the following example, `-noacls` is not used, and we see the difference in the output because the files are listed as different, compared to the preceding output with `-noacls` option.

```
C:\XCP>xcp verify -noatime -noownership \\10.61.77.189\vol_SMB_source_sushil\Microsoft.NET
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
61 compared, 0 same, 61 different, 0 missing, 5s
729 compared, 95 same, 634 different, 0 missing, 10s
1,142 compared, 117 same, 1,025 different, 0 missing, 15s
1,926 compared, 672 same, 1,254 different, 0 missing, 20s
2,679 compared, 1,425 same, 1,254 different, 0 missing, 25s
2,798 compared, 1,543 same, 1,255 different, 0 missing, 26s
Sending statistics...

C:\XCP>
```

verify -atimewindow <float>

The `verify -atimewindow` specifies the acceptable difference, in seconds, for the `atime` of a file, from the source to destination. So 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 verify -atimewindow 600 \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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>

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>`.

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

```
C:\XCP>xcp verify -ctimewindow 600 \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
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>

The `-ctimewindow` 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>`.

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

```
C:\XCP>xcp verify -mtimewindow 600 \\10.61.77.189\vol_SMB_source_sushil
\\10.61.77.56\vol_SMB_target_sushil
XCP SMB 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
-----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
```

```

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

The `verify -stats` command scans and compares the source and the destination. At the end of the scan, a tree statistics report is printed 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
-----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
on-target      38    80299    36914    15665    2049        144         3
on-source      same    same      same      same      same      same      same

  == Directory entries ==
      empty    1-10    10-100    100-1K    1K-10K    >10k
on-target     165   26012     615        37         8         3
on-source     same    same      same      same      same      same

  == Depth ==
      0-5    6-10    11-15    16-20    21-100    >100
on-target   159809   2143
on-source   same    same

  == Modified ==
      >1 year  >1 month  1-31 days  1-24 hrs    <1 hour    <15 mins    future
on-target   92399   47119    22434
on-source   same    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

The `verify -l` command lists the general 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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr 2 23:39:34 2018
---Truncated Output -----
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\MSXPSINC.GPD
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\LOCALE.GPD:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\P6FONT.GPD:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\MSXPSINC.PPD
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\P6DISP.GPD:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PCL4RES.DLL:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\MXDWDVRV.DLL:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PCL5ERES.DLL
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PCLXL.GPD:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PJL.GPD:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PCLXL.DLL:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PCL5URES.DLL
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PJLJMON.DLL:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PSCRIPT.HLP:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PS5UI.DLL:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PS_SCHM.GDL:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PSCRIPT.NTF:
Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PSCRIPT5.DLL
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\PSCRPTFE.NTF
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\STDNAMES.GPD
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\STDDTYPE.GDL
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\STDSCHM.GDL
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\STDSCHMX.GDL
: Changed (ownership)
WinSxS\x86_ntprint.inf_31bf3856ad364e35_6.3.9600.17415_none_cfecfc64d612e2fe\I386\TTFSUB.GPD:
Changed (ownership)

WinSxS\x86_wpf-presentationhostexe_31bf3856ad364e35_6.3.9600.16384_none_0493f7d83bb77377:
Changed (ownership, dacl)
WinSxS\x86_wpf-presentationhostproxy_31bf3856ad364e35_6.3.9600.16384_none_bf2adb339568b2a9:
Changed (ownership, dacl)
WinSxS\x86_wsapi.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 -l

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 1.1.1-ed4b037; (c) 2018 NetApp, Inc.; Licensed to Sushil Kumar [NetApp Inc] until Mon
Apr  2 23:39:34 2018
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
```

Glossary

The following table defines the terms that appear in the status line in the console once every 5 seconds

Step	Description
Compared	Total files compared between source and target system; option is visible during sync and verify operation.
Copied	Number of files that got copied to destination.
Different	Number of files that are different (size, content, and so on) compared from source to target and vice versa.
Errors	Reports number of files that reported any errors during read operation.
Filtered	Number of files that were skipped by the <code>-match</code> option.
Matched	Number of files that matched based on the filter used.

Step	Description
Missing	Number of files missing on destination during verify process.
Removed	Number of files that got removed during copy/sync operation.
Same	Number of files compared from source to target and vice versa that are the same.
Scanned	Total files scanned (from source and destination) by XCP during command execution.
Skipped	Number of files that got skipped during copy sync or verify operation.

Support

NetApp provides customers access to the NetApp XCP tool free of charge. Engineering support is presently offered, as described later, to the extent the necessary resources are reasonably available, as determined by NetApp, for so long as the tool is generally available for download through the NetApp Support site. This means that, although the XCP tool team has a vested interest in addressing issues and questions in a timely manner, there are no guaranteed response or resolution times or specific, associated service-level commitments.

The following are the additional details that better describe when and how NetApp provides support:

- Business hour support for this engineering-supported tool during business hours Central European Time (CET or UTC +1) Mondays–Fridays.
- Any questions/issues with XCP, contact the XCP support team directly via e-mail here: ng-xcp-support@netapp.com.

For additional information regarding XCP, refer to the NetApp XCP portal: <http://xcp.netapp.com>.

Refer to the [Interoperability Matrix Tool \(IMT\)](#) on the NetApp Support site to validate that the exact product and feature versions described in this document are supported for your specific environment. The NetApp IMT defines the product components and versions that can be used to construct configurations that are supported by NetApp. Specific results depend on each customer's installation in accordance with published specifications.

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