



XCP v1.6.1

User Guide

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1 XCP Overview

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

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

NetApp XCP File Analytics is host-based software that detects file shares, runs scans on the file system, and provides a dashboard for File Analytics. XCP File Analytics works for both NetApp and non-NetApp systems and runs on Linux or Windows hosts to provide analytics for NFS and SMB exported file systems. The single package includes the configuration script, the binary for Linux and Windows, and the binary for the File Analytics GUI. NetApp XCP File Analytics requires the installation of PostgreSQL.

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

[XCP NFS Command Reference](#)

[XCP SMB Command Reference](#)

1.1 Software and Licensing

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

Software Download

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

License

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

The Licensing types available on the portal are as follows:

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

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

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

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

1.2 XCP Host System Requirements

Table 1) XCP Host System Requirements.

| | NFS | SMB |
|--------|--|-----|
| System | 64-bit Intel or AMD server, minimum 4 cores and 32GB RAM | |

| | NFS | SMB |
|-----------------------------|--|---|
| Operating System & Software | <ul style="list-style-type: none"> Recent Linux distribution (RHEL 5.11 or later or kernel 2.6.18-404 or later) | <ul style="list-style-type: none"> Windows 2008 R2 or above Microsoft Visual C++ 2017 redistributable must be installed on the XCP host. |
| Special Requirements | <ul style="list-style-type: none"> Network connectivity and root level access to source and destination NFSv3 exports No other active applications Access to log in as root or to run sudo commands | <ul style="list-style-type: none"> The Source storage system, XCP host, and the target ONTAP system must be part of same Active Directory domain |
| Storage | <ul style="list-style-type: none"> 20MB of disk space for the XCP binary and at least 50MB of disk space for the logs that are stored in the /opt/NetApp/xFiles/xcp/ directory. | <ul style="list-style-type: none"> 20MB of disk space for the XCP binary and at least 50MB of disk space for the logs that are stored in the C:\NetApp\XCP directory |
| Supported Protocol Version | <ul style="list-style-type: none"> NFSv3 and NFSv4 (over TCP only) | <ul style="list-style-type: none"> All SMB protocol versions |

1.3 XCP File Analytics System Requirements

Table 2) File Analytics System Requirements.

| | Windows | Linux |
|-----------------------------|---|---|
| Hardware requirements. | 64-bit Intel or AMD server, minimum 4 cores and 32GB RAM, 1 NICs | |
| Operating System & Software | <ul style="list-style-type: none"> Windows 2012 R2 | <ul style="list-style-type: none"> Linux System RHEL 8, Minimum 20GB free space |

1.4 XCP File Analytics System Browser

XCP File Analytics supports Google Chrome version 76 and above.

2 XCP JSON Configuration File

XCP supports configuring multiple optional features using the `xcpLogConfig.json` JSON config file. To enable only specific features, manually create the `xcpLogConfig.json` configuration file, see [Create the JSON Configuration File](#).

You can use the `xcpLogConfig.json` configuration file to enable:

- event log messages
- syslog client for XCP
- custom XCP logging

Event log messages and the syslog client are disabled in the default configuration. Configuration is common for both NFS and SMB.

Table 3) JSON configuration file location

| Config JSON file location | NFS | SMB |
|--|-------------------------|--------------------------|
| Config file default location | /opt/NetApp/xFiles/xcp/ | C:\NetApp\XCP\ConfigFile |
| Custom location requires the XCP_CONFIG_DIR environment variable | XCP_CONFIG_DIR | NA |

2.1 Create the JSON Configuration File

If you want to enable event log messages, the syslog client, or customer logging, complete the following steps.

1. Open any text editor like notepad or vi.
2. Create a new file with the following JSON template.

```
{
  "logConfig": {
    "level": "INFO",
    "maxBytes": 52428800,
    "name": "xcp.log"
  },
  "eventlog": {
    "isEnabled": false,
    "level": "INFO"
  },
  "syslog": {
    "isEnabled": false,
    "level": "INFO",
    "serverIp": "10.234.219.87",
    "port": 514
  },
  "sanitize": false
}
```

3. For any features you want to enable, change the `isEnabled` value to `true`.
4. Name the file `xcpLogConfig.json` and save it to the file location mentioned in *Table 3) JSON configuration file location*

Table 4) Default versus example JSON configuration.

| Default configuration | Example json configuration file |
|---|--|
| <pre>{ "logConfig": { "level": "INFO", "maxBytes": 52428800, "name": "xcp.log" }, "sanitize": false }</pre> | <pre>{ "logConfig": { "level": "INFO", "maxBytes": 52428800, "name": "xcp.log" }, "eventlog": { "isEnabled": false, "level": "INFO" }, "syslog": { "isEnabled": false, "level": "INFO", "serverIp": "10.234.219.87",</pre> |

| | |
|--|---|
| | <pre> "port": 514 }, "sanitize": false } </pre> |
|--|---|

2.2 Description of options of config file

The following options are case sensitive.

Table 5) JSON configuration details

| Sub Options Name | JSON Data Type | Default | Description |
|------------------|----------------|----------|---|
| logConfig | | | Option to customize XCP logging. |
| "level" | String | INFO | Log message severity filter level. XCP log messages support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, DEBUG (NetApp strongly recommends using INFO or DEBUG) |
| "maxBytes" | Integer | 52428800 | Size of each rotating log file. Max supported rotation files are 10. |
| "name" | String | xcp.log | Option to set custom log file name. |
| Eventlog | | | Option to configure event log message. |
| "isEnabled" | Boolean | False | This boolean option is used to enable event messaging. Setting it <code>false</code> will not generate any event messages and no event logs will be published to event log file. |
| "level" | String | INFO | Event message severity filter level. Event messaging support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, DEBUG |
| Syslog | | | Option to configure syslog messaging. |
| "isEnabled" | Boolean | False | This boolean option is used to enable syslog client in XCP. |
| "level" | String | INFO | Message severity filter level. XCP event log messages support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, DEBUG |
| "serverIp" | String | None | Remote syslog server IP addresses or hostname. |
| "port" | Integer | 514 | Remote syslog receiver port. Syslog receivers accepting syslog datagrams on a different port can be configured with port option. the well-known UDP port 514 but may be configured to the desired port |
| | | | |
| "sanitize" | Boolean | false | It is a common option for XCP support, setting its value to <code>true</code> will hide sensitive information (IP and |

| Sub Options Name | JSON Data Type | Default | Description |
|------------------|----------------|---------|---|
| | | | <p>username) in the messages going to support (logging, events, syslog, etc.)</p> <p>For example, with the <code>sanitize</code> option as <code>false</code></p> <ul style="list-style-type: none"> 2020-07-17 03:10:23,779 - INFO - 12806 xcp xcp Paths: ['10.234.104.251:/cat_vol'] 2020-07-17 03:10:23,778 - INFO - 12806 xcp xcp User Name: root <p>With the <code>sanitize</code> option as <code>true</code></p> <ul style="list-style-type: none"> 2020-07-17 03:13:51,596 - INFO - 12859 xcp xcp Paths: ['IP: XX.XX.XX.XX:/cat_vol'] 2020-07-17 03:13:51,595 - INFO - 12859 xcp xcp User Name: ***** |

3 XCP NFS

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

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

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

XCP NFS Catalog

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

- A NetApp NFSv3 export for security and reliability.
- At least 10 disks or solid-state drives in the aggregate containing the export for performance.
- Storage configured to allow root access to the catalog export for the IP addresses of all Linux clients used to run XCP (multiple XCP clients can share a catalog location).
- Approximately 1GB of space for every 10 million objects (directories + files + hard links) to be indexed; each copy that can be resumed or synched and each offline-searchable scan requires an index.
- If you use XCP File Analytics, you do not need to configure the XCP Catalog.

Note: You should store XCP catalogs separately. They should not be located on either the source or destination NFS export directory. XCP maintains metadata—reports in the catalog location specified during the initial setup. You need to specify and update the location for storing the reports before you run any operation with XCP. Edit the `xcp.ini` file using an appropriate Linux file editor at `./opt/NetApp/xFiles/xcp/..` For more information, see [XCP NFS Installation](#).

XCP NFS Storage

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

- Source and target servers should have NFSv3 protocol service enabled. For NFSv4 ACL migration, the destination server must have NFSv4 protocol service enabled and NFSv4 ACL.
- Source and target volumes should be exported with `root` access to the XCP Linux client host.
 - Configure the source for NFSv3 and NFSv4 exports as read-only so administrators cannot accidentally modify it.
 - If the source file system is on SAN or DAS storage, add the file system to the Linux NFS exports giving `root` access and read-only permission to the host running XCP. For example, on RHEL/OEL/CentOS systems, the following commands enable XCP to `scan` and `copy` from the source:

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

- If the target file system is on a NetApp LUN (FAS, E-Series, NetApp FlashRay® system), add the file system to the Linux NFS export giving `root` access and read-write permission to the host running XCP. Then add the `async` option for performance. For example, on RHEL/OEL/CentOS systems, the following commands enable XCP to `scan` and `copy` to target:

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

4 XCP NFS Installation

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

Note: There is no option to upgrade, please install to replace any existing version.

Task Table 1) XCP NFS Initial Setup Procedure.

| Step | Action |
|------|---|
| 1. | Copy the XCP binary "xcp-nfs-<version>.tgz" on a Linux client host. |
| 2. | On the Linux client, extract the archive. <pre>[root@localhost /]# tar zxvf ./xcp-nfs-<version>.tgz</pre> |
| 3. | After extracting the archive, change the working directory to /linux. <pre>[root@localhost /]# cd xcp/linux/ [root@localhost linux]#</pre> |
| 4. | Display the list of files and subdirectories under the current working directory. Verify that the <code>_xcp_</code> file has read-write-execute permissions to the superuser (<code>root</code>). <pre>[root@localhost linux]# ls -alt total 20860 drwxr-xr-x 2 root root 17 Jan 11 2020 . drwxr-xr-x 3 root root 65 Jan 11 03:22 ..</pre> <p>Note: <code>-rwxr-xr-x 1 root root 21360432 Jan 8 17:29 xcp</code> Modify the file permissions and make the file executable using the <code>chmod 755</code> command and you may copy the xcp binary to "/"</p> |
| 5. | Run the <code>xcp show</code> or <code>xcp help</code> command. An error message appears indicating that the license is not activated. <pre>[root@localhost /]# ./xcp show localhost This copy is not licensed.</pre> |

| Step | Action |
|------|---|
| | <p>xcp: Host config directory not found. Creating at '/opt/NetApp/xFiles/xcp'</p> <p>xcp: Host config file not found. Creating sample at '/opt/NetApp/xFiles/xcp/xcp.ini'</p> <p>Command: show</p> <p>Paths: ['localhost']</p> <p>xcp: ERROR: License file /opt/NetApp/xFiles/xcp/license not found. Register for a license at https://xcp.netapp.com/ [root@localhost ~]#</p> <p>Note: The XCP host configuration directory and files are created at /opt/NetApp/xFiles/xcp, when the xcp show command is run for the first time.</p> |
| 6. | Copy the recently downloaded license file to the Linux host at /opt/NetApp/xFiles/xcp/.. |
| 7. | <p>Verify that the license file was copied at /opt/NetApp/xFiles/xcp/..</p> <pre>[root@localhost xcp]# ls -alt total 24 -rw-r--r-- 1 root root 8459 Jun 3 08:36 xcp.log drwxr-xr-x 2 root root 59 Jun 3 08:27 . -rw-r--r-- 1 root root 65 Jun 3 08:27 xcp.ini -rw-r--r-- 1 root root 128 Jun 3 04:12 host drwxr-xr-x 3 root root 16 Jun 3 04:09 .. -rw-r--r-- 1 root root 208 Jun 3 02:48 license</pre> |
| 8. | <p>Activate the XCP license on the Linux client.</p> <pre>[root@localhost ~]# ./xcp activate</pre> <p>XCP activated</p> |
| 9. | <p>Verify that the license error has disappeared.</p> <pre>[root@localhost ~]# ./xcp show localhost</pre> <p>xcp: ERROR: Catalog inaccessible: Cannot mount nfs_server:/export[:subdirectory] Failed with 'socket connect to nfs_server tcp 111 pmap2 c0: [Errno -2] Name or service not known'</p> <p>xcp: HINT: Verify the settings in the host config file /opt/NetApp/xFiles/xcp/xcp.ini. Sending statistics...</p> |
| 10. | <p>Add the catalog location for the XCP server in the host configuration file using the vi editor.</p> <p>Note: Catalog location should be exported before modifying the details in the xcp.ini XCP configuration file. Catalog location (NFSv3) should be mountable by the XCP Linux host but not necessarily be mounted.</p> <pre>[root@localhost ~]# vi /opt/NetApp/xFiles/xcp/xcp.ini</pre> |
| 11. | <p>Verify that the XCP Linux client host configuration file entries for the catalog were modified.</p> <pre>[root@localhost ~]# cat /opt/NetApp/xFiles/xcp/xcp.ini # Sample xcp config [xcp] catalog = 10.61.82.210:/vol/xcpvol/</pre> |
| 12. | <p>Run the ./xcp command and verify that no errors were reported for license and catalog configuration.</p> <pre>[root@localhost ~]# ./xcp</pre> <p>USAGE</p> <pre>xcp [scan] [options] path xcp show [options] servers xcp copy/verify [options] source_path target_path</pre> |

| Step | Action |
|------|---|
| | Path format server:export[:subdirectory] |

5 XCP NFS Command Reference

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

Table 6) XCP NFS Command Reference.

| Feature | Description |
|-------------------------|---|
| Core Engine Innovations | <ul style="list-style-type: none"> • Supports Linux, CLI only • Extreme performance (~25x comparable tools) • Multiple layers of granularity (qtrees, subdirectories, criteria-based filtering) • Easy deployment (64-bit Linux host-based software) |
| "help" | Displays information about XCP commands and options. Use "help info" to display documentation, examples and tuning recommendations. |
| "show" | Discovers servers and file systems. .-v: show more detailed information about servers |
| "activate" | Activates XCP license on Linux client host systems |
| "scan" | <p>Scopes and provides dashboards of the directories, files, and data in the file systems.</p> <p>.-l, -q: File listing output formats</p> <p>.-stats, -csv, -html: Tree statistics report formats</p> <p>.-nonames: Do not look up user and group names for file listings or reports</p> <p>.-newid <name>: Catalog name for a new index</p> <p>.-id <name>: Catalog name of a previous copy or scan index</p> <p>.-match <filter>: Only process files and directories that match the filter</p> <p>.-fmt <string expression>: formatted output</p> <p>.-du: Summarize space usage of each directory including subdirectories</p> <p>.-md5: Checksum the files (also save the checksums when indexing) (default: False)</p> <p>.-duk: Same as du, with output in kilobytes</p> <p>.-depth <n>: limit the search depth</p> <p>.-dircount <n[k]>: Request size for reading directories (default: 64k)</p> <p>.-edupe: Include dedupe estimate in reports (see documentation for details)</p> <p>.-bs <n[k]>: read/write block size for scans which read data with -md5 or -edupe (default: 64k)</p> <p>.-parallel <n>: Maximum concurrent batch processes (default: 7)</p> <p>.-noId: Disables the creation of a default index (default: False)</p> <p>.-subdir-names: return names of top level sub-dirs in a directory</p> |

| Feature | Description |
|-------------------|---|
| "copy." | <p>Any to NetApp copy (third-party FSs, UNIX SAN/DAS/NAS to FAS, E-Series).</p> <p><code>.-newid <name>:</code> Catalog name for a new index</p> <p><code>.-md5:</code> Checksum the files (also save the checksums when indexing) (default: <code>False</code>)</p> <p><code>.-edupe:</code> Include dedupe estimate in reports (see documentation for details)</p> <p><code>.-nonames:</code> Do not look up user and group names for file listings or reports</p> <p><code>.-bs <n[k]>:</code> read/write block size (default: <code>.64k</code>)</p> <p><code>.-dircount <n[k]>:</code> Request size for reading directories (default: <code>.64k</code>)</p> <p><code>.-parallel <n>:</code> Maximum concurrent batch processes (default: <code>.7</code>)</p> <p><code>.-noId:</code> Disables the creation of a default index (default: <code>False</code>)</p> <p><code>.-match <filter>:</code> Only process files and directories that match the filter</p> |
| "license." | Display XCP license information. |
| "license update." | Retrieves the latest license from the XCP server |
| "resume." | <p>Fast log-based recovery of in-progress jobs.</p> <p><code>.-id <name>:</code> Catalog name of a previous copy index</p> <p><code>.-bs <n[k]>:</code> read/write block size (default: <code>.64k</code>)</p> <p><code>.-dircount <n[k]>:</code> Request size for reading directories (default: <code>.64k</code>)</p> <p><code>.-parallel <n>:</code> Maximum concurrent batch processes (default: <code>.7</code>)</p> <p><code>.-dircount <n[k]>:</code> Request size for reading directories (default: <code>.64k</code>)</p> |
| "sync." | <p>Differential incremental updates from source to target at the file level.</p> <p><code>.-id <name>:</code> Catalog name of a previous copy index</p> <p><code>.-snap <name or path>:</code> Access a snapshot of the source tree</p> <p><code>.-nonames:</code> Do not look up user and group names for file listings or reports</p> <p><code>.-bs <n[k]>:</code> read/write block size (default: <code>.64k</code>)</p> <p><code>.-dircount <n[k]>:</code> Request size for reading directories (default: <code>.64k</code>)</p> <p><code>.-parallel <n>:</code> Maximum concurrent batch processes (default: <code>.7</code>)</p> <p><code>.-match <filter>:</code> Only process files and directories that match the filter</p> |

| Feature | Description |
|---------------------------|--|
| "sync dry-run" | <p>Finds source changes but does not apply them to the target.</p> <p><code>.-id <name>:</code> Catalog name of a previous copy index</p> <p><code>.-snap <name or path>:</code> Access a snapshot of the source tree</p> <p><code>-stats:</code> deep scan the modified directories and report on everything that's new</p> <p><code>.-nonames:</code> Do not look up user and group names for file listings or reports</p> <p><code>.-v, -l, -q:</code> File listing output formats</p> <p><code>.-dircount <n[k]>:</code> Request size for reading directories (default: .64k)</p> <p><code>.-parallel <n>:</code> Maximum concurrent batch processes (default: .7)</p> <p><code>.-target:</code> Check that the target files match the index</p> |
| "verify" | <p>Three levels of assurance: statistics, structure, and full data bit by bit.</p> <p><code>.-stats, -csv:</code> Scan source and target trees in parallel and compare tree statistics</p> <p><code>.-nodata:</code> Do not check data</p> <p><code>.-noattrs:</code> Do not check attributes</p> <p><code>.-nomods:</code> Do not check file modification times</p> <p><code>.-mtimewindow <s>:</code> Acceptable modification time difference for verification</p> <p><code>.-newid <name>:</code> Catalog name for a new index</p> <p><code>.-v, -l:</code> Output formats to list any differences found</p> <p><code>.-nonames:</code> Do not look up user and group names for file listings or reports</p> <p><code>.-match <filter>:</code> Only process files and directories that match the filter</p> <p><code>.-bs <n[k]>:</code> read/write blocksize (default: .64k)</p> <p><code>.-parallel <n>:</code> Maximum concurrent batch processes (default: .7)</p> <p><code>.-dircount <n[k]>:</code> Request size for reading directories (default: .64k)</p> <p><code>.-newdata <id name>:</code> Verify full structure + names + attributes plus new data from the last sync</p> <p><code>.-noId:</code> Disables the creation of a default index (default: False)</p> |
| "delete" | Deletes everything in given path. |
| License Management Portal | Several types of renewable free licenses are available with options for connected and offline environments |
| Logging and Reporting | Events, sources, targets, files, data, and performance |

5.1 help

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

Syntax

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

Example

```
[root@localhost /]# ./xcp help
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
help: Display information about commands and options
```

```

help info: Display documentation, examples and tuning recommendations

show: Request information from hosts about NFS and other RPC services
  -v: show more detailed information about servers

scan: Read all the directories in a file tree or a saved index
  -l, -q: File listing output formats
  -stats, -csv, -html: Tree statistics report formats
  -nonames: Do not look up user and group names for file listings or reports
  -newid <name>: Catalog name for a new index
  -id <name>: Catalog name of a previous copy or scan index
  -match <filter>: Only process files and directories that match the filter
  -fmt <string expression>: formatted output
  -du: Summarize space usage of each directory including subdirectories
  -md5: Checksum the files (also save the checksums when indexing) (default: False)
  -duk: Same as du, with output in kilobytes
  -acl4: process nfs4 acls
  -acl4.threads <n>: per-process thread pool size (default: 100)
  -acl4.mountlist <local or NFS path>: flat file in case /usr/bin/findmnt is missing or broken
  -depth <n>: limit the search depth
  -dircount <n[k]>: Request size for reading directories (default: 64k)
  -edupe: Include dedupe estimate in reports (see documentation for details)
  -bs <n[k]>: read/write blocksize for scans which read data with -md5 or -edupe (default: 64k)
  -parallel <n>: Maximum concurrent batch processes (default: 7)
  -noId: Disables the creation of a default index (default: False)
  -subdir-names: return names of top level sub-dirs in a directory
  -newlog: option to opt for multiple log files (default: False)
  --loglevel <name>: option to set log level (default: INFO)

copy: Recursively copy everything from source to target
  -newid <name>: Catalog name for a new index
  -md5: Checksum the files (also save the checksums when indexing) (default: False)
  -edupe: Include dedupe estimate in reports (see documentation for details)
  -nonames: Do not look up user and group names for file listings or reports server

```

Parameters

The following table describes the `help` parameters.

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

help info

Display documentation, examples, and tuning recommendations.

```

[root@localhost /]# ./xcp help info
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
One file to rule them all

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

Path format
  server:export[:subdirectory]

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

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

EXAMPLES
  Query a server to see its RPC services and NFS exports;

```

print a human-readable tree report for one of the NFS exports;
and list all the files from the root of a subdirectory:

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

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

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

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

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

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

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

DESCRIPTION

When run as "xcp <path>", without any options, xcp recursively scans the tree rooted at the path and prints the list of all the files. Options such as -l can change the format; option -md5 makes xcp read each file and print the checksums in the output. Filters (see below) can select which directories to enter and which files to process.

If -newid is used, the reports and logs and metadata index of searches and copies are saved in the catalog tree. Using a new id also allows xcp to resume an interrupted job, such as a copy or a scan. Each index requires about 1GB of space for every 10 million files. If -md5 (or another option which enables checksumming such as -edupe) is used during the copy, the index will also contain the data checksums of each file. Note that checksums are not used by xcp for anything; the verify feature uses a full byte-by-byte data comparison.

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

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

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

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

To boost the performance of crawls use faster CPUs, and to boost performance of other tasks (filtering, copying, etc) use a multi-core system with a lot of memory; copying a large, deep tree with millions of files may require a few gigabytes of RAM on the system where xcp is running.

To migrate an entire multiuser file tree at once, it usually works best to export the source to a host with read-only and root access, and then from that host run xcp as root.

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

For example; to access a SAN filesystem mounted on /local on Linux just add the following to /etc/exports and restart the Linux NFS services (typically "sudo service nfs restart"):

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

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

NOTE: to copy files _to_ a filesystem through the Linux NFS server, the async option improves performance tremendously and setting RPCNFSDCOUNT=128 in /etc/sysconfig/nfs and restarting nfs services may improve write performance (for RHEL/CentOS; other distros may vary)

OUTPUT

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

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

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

FILTERS

A filter expression should evaluate to True or False in Python.
See below for some examples with the `-match` filters.

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

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

Functions available to use in a filter:

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

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

Filter examples:

Match files modified less than half an hour ago
`-match "type == f and modified < .5"`

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

Same match using regular expressions:
`-match "rxm('.*core.*')"`

Same match using wildcards:
`-match "fnm('*core*')"`

Match files that are not regular files, directories, or links:
`-match "type not in (f,d,l)"`

Find jpg files over 500 Megabytes (note M is a variable)
`-match "fnm('*.jpg') and size > 500*M"`

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

Xcp prints size units according to the international standard, i.e. it shows a base 2 kilobyte as "1 KiB", a megabyte as "1 MiB", etc; however for easier typing in filters the variable names for size units are K = 1KiB, M = 1MiB, etc. In both cases the values represented are powers of 2. File counts are shown with abbreviations of powers of 10, e.g. 1.1M = 1.1 million.

PERFORMANCE

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

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

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

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

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

`-batchlen`: approximate files per batch (default 5000 for copying, 50000 for searching)
`-batchsize`: when copying, a size threshold for the amount of data per batch (default 500M)

-giant: single-batch file threshold; giant files will get their own batch (default 900M)

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

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

For small numbers of files and/or when there is a network qos limiter, you may also be able to increase performance by opening multiple channels. The usage section above shows how to use multiple host target addresses and the same syntax also opens more channels to a single target. For example: "host1,host1:/vol/src" makes each xcp process open 2 channels to host1. In some WAN environments this can improve performance. Within a datacenter, if there are only 1GbE NICs on the host with XCP it usually helps to use the multipath syntax to leverage more than one NIC.

To validate that you are actually running IO over multiple paths, use OS tools to monitor network IO. For example, on Linux try "sar -n DEV 2 200"

VERIFICATION, CHANGES, UPDATES

The verify command will compare any two file trees without using a catalog index. Verify scans the source tree and looks up every file and directory on the target. It will also check modification times and other file attributes including permissions and it will read the files on both sides and compare the data. Options:

- nodata: do not verify data
- nomods: do not verify modification times
- noattrs: do not verify other attributes (type, size, permissions, uid, gid, nlinks)

The verify method is useful when trees are identical but if a source directory moved or if its name changed, verify will not find any files under that directory even though they are still in the target tree. In these situations a "sync dry-run" will be more effective.

Verify has one option which helps to detect and analyze trees with differences; with -stats or -csv it will do a scan of each tree and check that the statistics of the two trees match, such as the total number of files and directories, the number of files in the size bins (empty, <1k, 1-8K, etc) the tree depth bins, etc. When using a catalog, all the reports will be saved.

With -l, all files with differences are listed in human-readable format with an asterisk in front of whichever fields actually differ; in these examples the modification time of 'a' is different and the permissions, setuid, setgid, uid, and gid of abc are all different:

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

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

Each difference is shown with the source file on one line followed by a line with the target side values that differ.

Differences which are not included in the output, such as number of hard links, will cause the file to be listed without any asterisks.

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

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

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

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

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

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

renamed and moved). Examples:

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

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

Note that the attributes (including modification and change times) saved in the index are scanned

before copying and indexing, so all post-scan source changes can be detected.

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

During the sync, modified files are recopied.

VIRTUAL FILESYSTEMS

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

This capability is work in progress.

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

ENVIRONMENT VARIABLES

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

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

When a custom config dir is set, a folder named hostname (hostname of machine) is created under the given path and a log file will be created under this folder (hostname) with name xcp.log

XCP_LOG_DIR - Override the default, which is to store the xcp log in the config dir. If set, the value should be an OS filesystem path; possibly to a mounted NFS dir.

When a custom log dir is set, a folder named hostname (hostname of machine) is created under the given path and log file will be created under this folder (hostname) with name xcp.log

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

SECURITY

All the files and directories in the catalog are world readable except for the index files which have a ".index" suffix and are located in subdirectories under the top-level catalog "indexes" directory.

Because each index file is essentially an archive of metadata of an entire file tree, the catalog should be stored on a NetApp volume with export permissions matching the the actual sources and targets. Note that file data is NOT stored in the index; just metadata.

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

NOTES

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

- ".", "..", and ".snapshot" directory entries are ignored
 - A subdirectory with a new filesystem id (AKA a filesystem junction) will not be scanned.
 - When using a filter, xcp's du only prints directories which have matches under them
 - Blocks that are all zero are not copied so the target files will be sparse.
- Both the zero-block and dedupe calculations use the default blocksize (typically 64k)
Use "-bs 4k" to get a more accurate calculation (this may be slower and use more memory)
- The dedupe estimate uses checksums rather than comparing actual block data. Collisions (different blocks with same checksum) occur very rarely with negligible effect on the result.
Dedupe estimation (-dedupe) can use a lot of memory and can slow down processing

LICENSES, COPYRIGHTS

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

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SUPPORT

<https://www.netapp.com/us/contact-us/support.aspx>

MORE EXAMPLES

Recursively list all files in a subdirectory within an export:

```
xcp -l localhost:/usr:share
```

Crawl an export and save a report in html:

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

Crawl a local filesystem print a human-readable report:

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

```
xcp -stats localhost:/usr
```

List a single directory but do not enter its subdirectories

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

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

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

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

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

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

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

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

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

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

List the files in the catalog:

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

Check every file on the source for changes (compare current metadata to the indexed metadata that was stored in the catalog when the copy was made):

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

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

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

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

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

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

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

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

Checksum 1 out of every 20 regular files at random:

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

List an export's directory structure:

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

```
[root@scspr1845243002 source_vol]#
```

5.2 show

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

Syntax

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

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

Example

```
[root@localhost /]# ./xcp show 172.21.88.54
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

getting pmap dump from 172.21.88.54 port 111...
getting export list from 172.21.88.54...
sending 3 mounts and 12 nfs requests to 172.21.88.54...

== RPC Services ==
'172.21.88.54': UDP rpc services: MNT v1/2/3, NFS v3, NLM v4, PMAP v2/3/4, STATUS v1
'172.21.88.54': TCP rpc services: MNT v1/2/3, NFS v3/4, NLM v4, PMAP v2/3/4, STATUS v1

== NFS Exports ==
Mounts  Errors  Server
      3         0  172.21.88.54

      Space      Files      Space      Files
      Free      Free      Used      Used Export
93.9 MiB  19,886  1.10 MiB    104 172.21.88.54:/
9.44 GiB   2.49M   65.7 MiB    276 172.21.88.54:/catalog_vol
84.9 GiB   22.4M    593 MiB    115 172.21.88.54:/source_vol

== Attributes of NFS Exports ==
drwxr-xr-x --- root root 4KiB 4KiB 6d2h 172.21.88.54:/
drwxr-xr-x --- root root 4KiB 4KiB 6d2h 172.21.88.54:/catalog_vol
drwxr-xr-x --- root root 4KiB 4KiB 1h30m 172.21.88.54:/source_vol

Xcp command : xcp show 172.21.88.54
0 error
Speed       : 3.62 KiB in (17.9 KiB/s), 6.28 KiB out (31.1 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

Parameters

| Feature | Description |
|-----------------------|--|
| <code>.show -v</code> | Print verbose details about NFS servers using the IP address or host name. |

5.3 License

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

Syntax

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

Example

```
[root@localhost /]# ./xcp license
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2020

Licensed to "XXX, NetApp Inc, XXX@netapp.com" until Sun Mar 31 00:00:00 2029
License type: SANDBOX
License status: ACTIVE
Customer name: N/A
Project number: N/A
```

```
Offline Host: Yes
Send statistics: No
Host activation date: N/A
License management URL: https://xcp.netapp.com
```

Parameters

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

license update

Retrieve the latest license from the XCP server.

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

```
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2029
```

5.4 activate

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

Syntax

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

Example

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

```
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2029
```

```
XCP already activated
```

5.5 scan

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

Syntax

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

Example

```
[root@localhost /]# ./xcp scan 172.21.88.54:/source_vol
```

```
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
```

```
source_vol
source_vol/r1.txt
source_vol/USER.1
source_vol/USER.2
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
source_vol/USER.1/FILE_5
source_vol/USER.1/file1.txt
source_vol/USER.1/file2.txt
source_vol/USER.1/logfile.txt
source_vol/USER.1/log1.txt
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4
```

```
Xcp command : xcp scan 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed       : 4.59 KiB in (4.20 KiB/s), 756 out (692/s)
```

```
Total Time : 1s.  
STATUS    : PASSED
```

Parameters

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

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

scan -l

File listing output formats.

```
[root@localhost /]# ./xcp scan -l 172.21.88.54:/source_vol  
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029  
  
drwxr-xr-x --- root root 4KiB 4KiB 6s source_vol  
drwxr-xr-x --- root root 4KiB 4KiB 42s source_vol/USER.1  
drwxr-xr-x --- root root 4KiB 4KiB 42s source_vol/USER.2  
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.1/FILE_1  
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.1/FILE_2  
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.1/FILE_3  
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.1/FILE_4  
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.1/FILE_5  
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.2/FILE_1
```

```

rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.2/FILE_5
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.2/FILE_2
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.2/FILE_3
rw-r--r-- --- root root 1KiB 4KiB 42s source_vol/USER.2/FILE_4

```

```

Xcp command : xcp scan -l 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed       : 3.73 KiB in (4.89 KiB/s), 756 out (989/s)
Total Time  : 0s.
STATUS      : PASSED

```

scan -q

File listing output formats.

```

[root@localhost /]# ./xcp scan -q 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

Xcp command : xcp scan -q 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed       : 3.73 KiB in (3.96 KiB/s), 756 out (801/s)
Total Time  : 0s.
STATUS      : PASSED

```

scan -stats

Tree statistics report formats.

```

[root@localhost /]# ./xcp scan -stats 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

== Maximum Values ==
      Size      Used      Depth      Namelen      Dirsize
      1 KiB      4 KiB          2          10          5

== Average Values ==
      Namelen      Size      Depth      Dirsize
          6      1 KiB          1          4

== Top Space Users ==
      root
      52 KiB

== Top File Owners ==
      root
      13

== Top File Extensions ==
      other
      10

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

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

== Directory entries ==
      empty      1-10      10-100      100-1K      1K-10K      >10K
                        3

== Depth ==
      0-5      6-10      11-15      16-20      21-100      >100
      13

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

```



```

10

== Modified ==
>1 year    >1 month  1-31 days   1-24 hrs    <1 hour    <15 mins    future
10

== Changed ==
>1 year    >1 month  1-31 days   1-24 hrs    <1 hour    <15 mins    future
10

Total count: 13
Directories: 3
Regular files: 10
Symbolic links: None
Special files: None
Hard links: None,
multilink files: None,
Space Saved by Hard links (KB): 0
Sparse data: N/A
Dedupe estimate: N/A
Total space for regular files: size: 10 KiB, used: 40 KiB
Total space for symlinks: size: 0, used: 0
Total space for directories: size: 12 KiB, used: 12 KiB
Total space used: 52 KiB

Xcp command : xcp scan -stats 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed       : 3.73 KiB in (8.07 KiB/s), 756 out (1.60 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
[root@scspr1845243002 source_vol]#

```

scan -csv

Tree statistics report formats.

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

```

[root@localhost /]# ./xcp scan -csv 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp,1.6-dev
date,03-Mar-2020 10:51 PM EST
scan 172.21.88.54:/source_vol
options,"{'-csv': True}"
summary,"13 scanned, 3.73 KiB in (11.3 KiB/s), 756 out (2.23 KiB/s), 0s."

Maximum Values,Size,Used,Depth,Namelen,Dirsize
Maximum Values,1024,4096,2,10,5
Average Values,Namelen,Size,Depth,Dirsize
Average Values,6,1024,1,4
Top Space Users,root
Top Space Users,53248
Top File Owners,root
Top File Owners,13
Top File Extensions,other
Top File Extensions,10
Number of files,empty,<8KiB,8-64KiB,64KiB-1MiB,1-10MiB,10-100MiB,>100MiB
Number of files,0,10,0,0,0,0,0
Space used,empty,<8KiB,8-64KiB,64KiB-1MiB,1-10MiB,10-100MiB,>100MiB
Space used,0,40960,0,0,0,0,0
Directory entries,empty,1-10,10-100,100-1K,1K-10K,>10K
Directory entries,0,3,0,0,0,0
Depth,0-5,6-10,11-15,16-20,21-100,>100
Depth,13,0,0,0,0,0
Accessed,>1 year,>1 month,1-31 days,1-24 hrs,<1 hour,<15 mins,future
Accessed,0,0,0,0,0,10,0
Modified,>1 year,>1 month,1-31 days,1-24 hrs,<1 hour,<15 mins,future
Modified,0,0,0,0,0,10,0
Changed,>1 year,>1 month,1-31 days,1-24 hrs,<1 hour,<15 mins,future
Changed,0,0,0,0,0,10,0
Total count,13
Directories,3

```

```

Regular files,10
Symbolic links,0
Special files,0
Hard links,0,
multilink files,0,
Space Saved by Hard links (KB),0
Sparse data,N/A
Dedupe estimate,N/A
Total space for regular files,size,10240,used,40960
Total space for symlinks,size,0,used,0
Total space for directories,size,12288,used,12288
Total space used,53248

Xcp command : xcp scan -csv 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed      : 3.73 KiB in (11.2 KiB/s), 756 out (2.22 KiB/s)
Total Time : 0s.
STATUS     : PASSED

```

scan -html

Tree statistics report formats.

```

[root@localhost /]# ./xcp scan -html 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

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

[redacted HTML contents]

</body></html>

Xcp command : xcp scan -html 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed      : 3.73 KiB in (4.31 KiB/s), 756 out (873/s)
Total Time : 0s.
STATUS     : PASSED
[root@scspr1845243002 source_vol]#

```

scan -nonames

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

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

```

[root@localhost /]# ./xcp scan -nonames 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol
source_vol/USER.1
source_vol/USER.2
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
source_vol/USER.1/FILE_5
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4

Xcp command : xcp scan -nonames 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed      : 3.73 KiB in (4.66 KiB/s), 756 out (944/s)
Total Time : 0s.
STATUS     : PASSED

```

scan -newid <name>

Catalog name for a new index.

```

[root@localhost /]# ./xcp scan -newid ID001 172.21.88.54:/source_vol

```

```
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
```

```
Xcp command : xcp scan -newid ID001 172.21.88.54:/source_vol
13 scanned, 0 matched, 0 error
Speed       : 13.8 KiB in (17.7 KiB/s), 53.1 KiB out (68.0 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

scan -id <name>

Catalog name of a previous copy or scan index.

```
[root@localhost /]# ./xcp scan -id 3
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2029

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

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

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

scan -match <filter>

Only process files and directories that match the filter.

```
[root@localhost /]# ./xcp scan -match bin 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
source_vol/USER.1/FILE_5
source_vol/USER.1/file1.txt
source_vol/USER.1/file2.txt
source_vol/USER.1/logfile.txt
source_vol/USER.1/log1.txt
source_vol/r1.txt
source_vol/USER.1
source_vol/USER.2
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4

Filtered: 0 did not match

Xcp command : xcp scan -match bin 172.21.88.54:/source_vol
18 scanned, 18 matched, 0 error
Speed       : 4.59 KiB in (6.94 KiB/s), 756 out (1.12 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

scan -fmt <string expression>

Only process files and directories that match the format.

```
[root@localhost /]# ./xcp scan -fmt "'{},{}, {}, {}, {}'.format(name, x, ctime, atime, mtime)"
172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol, 172.21.88.54:/source_vol, 1583294484.46, 1583294492.63, 1583294484.46
FILE_1, 172.21.88.54:/source_vol/USER.1/FILE_1, 1583293637.88, 1583293637.83, 1583293637.83
FILE_2, 172.21.88.54:/source_vol/USER.1/FILE_2, 1583293637.88, 1583293637.83, 1583293637.84
```

```

FILE_3, 172.21.88.54:/source_vol/USER.1/FILE_3, 1583293637.88, 1583293637.84, 1583293637.84
FILE_4, 172.21.88.54:/source_vol/USER.1/FILE_4, 1583293637.88, 1583293637.84, 1583293637.84
FILE_5, 172.21.88.54:/source_vol/USER.1/FILE_5, 1583293637.88, 1583293637.84, 1583293637.84
file1.txt, 172.21.88.54:/source_vol/USER.1/file1.txt, 1583294284.78, 1583294284.78, 1583294284.78
file2.txt, 172.21.88.54:/source_vol/USER.1/file2.txt, 1583294284.78, 1583294284.78, 1583294284.78
logfile.txt, 172.21.88.54:/source_vol/USER.1/logfile.txt, 1583294295.79, 1583294295.79,
1583294295.79
log1.txt, 172.21.88.54:/source_vol/USER.1/log1.txt, 1583294295.8, 1583294295.8, 1583294295.8
r1.txt, 172.21.88.54:/source_vol/r1.txt, 1583294484.46, 1583294484.45, 1583294484.45
USER.1, 172.21.88.54:/source_vol/USER.1, 1583294295.8, 1583294492.63, 1583294295.8
USER.2, 172.21.88.54:/source_vol/USER.2, 1583293637.95, 1583294492.63, 1583293637.95
FILE_1, 172.21.88.54:/source_vol/USER.2/FILE_1, 1583293637.95, 1583293637.94, 1583293637.94
FILE_5, 172.21.88.54:/source_vol/USER.2/FILE_5, 1583293637.96, 1583293637.94, 1583293637.94
FILE_2, 172.21.88.54:/source_vol/USER.2/FILE_2, 1583293637.96, 1583293637.95, 1583293637.95
FILE_3, 172.21.88.54:/source_vol/USER.2/FILE_3, 1583293637.96, 1583293637.95, 1583293637.95
FILE_4, 172.21.88.54:/source_vol/USER.2/FILE_4, 1583293637.96, 1583293637.95, 1583293637.96

Xcp command : xcp scan -fmt '{}', {}, {}, {}, {}'.format(name, x, ctime, atime, mtime)
172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed      : 4.59 KiB in (4.14 KiB/s), 756 out (683/s)
Total Time : 1s.
STATUS     : PASSED

```

scan -du

Summarize space usage of each directory, including subdirectories.

```

[root@localhost /]# ./xcp scan -du 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

    24KiB source_vol/USER.1
    24KiB source_vol/USER.2
    52KiB source_vol

Xcp command : xcp scan -du 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed      : 4.59 KiB in (12.9 KiB/s), 756 out (2.07 KiB/s)
Total Time : 0s.
STATUS     : PASSED

```

scan -md5

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

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

```

[root@localhost /]# ./xcp scan -md5 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

                                source_vol
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.1/FILE_1
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.1/FILE_2
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.1/FILE_3
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.1/FILE_4
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.1/FILE_5
d41d8cd98f00b204e9800998ecf8427e source_vol/USER.1/file1.txt
d41d8cd98f00b204e9800998ecf8427e source_vol/USER.1/file2.txt
d41d8cd98f00b204e9800998ecf8427e source_vol/USER.1/logfile.txt
d41d8cd98f00b204e9800998ecf8427e source_vol/USER.1/log1.txt
e894f2344aaa92289fb57bc8f597ffa9 source_vol/r1.txt
                                source_vol/USER.1
                                source_vol/USER.2
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.2/FILE_1
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.2/FILE_5
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.2/FILE_2
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.2/FILE_3
d47b127bc2de2d687ddc82dac354c415 source_vol/USER.2/FILE_4

Xcp command : xcp scan -md5 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed      : 16.0 KiB in (34.5 KiB/s), 2.29 KiB out (4.92 KiB/s)

```

```
Total Time : 0s.  
STATUS      : PASSED
```

scan -depth <n>

Limit the search depth.

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

```
[root@localhost /]# ./xcp scan -depth 2 172.21.88.54:/source_vol  
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029  
  
source_vol  
source_vol/r1.txt  
source_vol/USER.1  
source_vol/USER.2  
source_vol/USER.1/FILE_1  
source_vol/USER.1/FILE_2  
source_vol/USER.1/FILE_3  
source_vol/USER.1/FILE_4  
source_vol/USER.1/FILE_5  
source_vol/USER.1/file1.txt  
source_vol/USER.1/file2.txt  
source_vol/USER.1/logfile.txt  
source_vol/USER.1/log1.txt  
source_vol/USER.2/FILE_1  
source_vol/USER.2/FILE_5  
source_vol/USER.2/FILE_2  
source_vol/USER.2/FILE_3  
source_vol/USER.2/FILE_4  
  
Xcp command : xcp scan -depth 2 172.21.88.54:/source_vol  
18 scanned, 0 matched, 0 error  
Speed       : 4.59 KiB in (6.94 KiB/s), 756 out (1.12 KiB/s)  
Total Time  : 0s.  
STATUS      : PASSED
```

scan -dircount <n[k]>

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

```
[root@localhost /]# ./xcp scan -dircount 64k 172.21.88.54:/source_vol  
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029  
  
source_vol  
source_vol/USER.1/FILE_1  
source_vol/USER.1/FILE_2  
source_vol/USER.1/FILE_3  
source_vol/USER.1/FILE_4  
source_vol/USER.1/FILE_5  
source_vol/USER.1/file1.txt  
source_vol/USER.1/file2.txt  
source_vol/USER.1/logfile.txt  
source_vol/USER.1/log1.txt  
source_vol/r1.txt  
source_vol/USER.1  
source_vol/USER.2  
source_vol/USER.2/FILE_1  
source_vol/USER.2/FILE_5  
source_vol/USER.2/FILE_2  
source_vol/USER.2/FILE_3  
source_vol/USER.2/FILE_4  
  
Xcp command : xcp scan -dircount 64k 172.21.88.54:/source_vol  
18 scanned, 0 matched, 0 error  
Speed       : 4.59 KiB in (4.79 KiB/s), 756 out (790/s)  
Total Time  : 0s.  
STATUS      : PASSED
```

scan -edupe

Include dedupe estimate in reports.

```
[root@localhost /]# ./xcp scan -edupe 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
```

```
== Maximum Values ==
      Size      Used      Depth      Namelen      Dirsizes
      1 KiB      4 KiB          2          11          9

== Average Values ==
      Namelen      Size      Depth      Dirsizes
          6      682          1          5

== Top Space Users ==
      root
      52 KiB

== Top File Owners ==
      root
      18

== Top File Extensions ==
      .txt      other
          5          10

== Number of files ==
      empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-100MiB      >100MiB
          4          11

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

== Directory entries ==
      empty      1-10      10-100      100-1K      1K-10K      >10K
          3

== Depth ==
      0-5      6-10      11-15      16-20      21-100      >100
      18

== Accessed ==
      >1 year      >1 month 1-31 days 1-24 hrs      <1 hour      <15 mins      future
          4          11

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

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

Total count: 18
Directories: 3
Regular files: 15
Symbolic links: None
Special files: None
Hard links: None,
multilink files: None,
Space Saved by Hard links (KB): 0
Sparse data: None
Dedupe estimate: N/A
Total space for regular files: size: 10.0 KiB, used: 40 KiB
Total space for symlinks: size: 0, used: 0
Total space for directories: size: 12 KiB, used: 12 KiB
Total space used: 52 KiB

Xcp command : xcp scan -edupe 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed      : 16.0 KiB in (52.7 KiB/s), 2.29 KiB out (7.52 KiB/s)
Total Time : 0s.
STATUS      : PASSED
```

scan -bs<n[k]>

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

```
[root@localhost /]# ./xcp scan -bs 32 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol
source_vol/r1.txt
source_vol/USER.1
source_vol/USER.2
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
source_vol/USER.1/FILE_5
source_vol/USER.1/file1.txt
source_vol/USER.1/file2.txt
source_vol/USER.1/logfile.txt
source_vol/USER.1/log1.txt
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4

Xcp command : xcp scan -bs 32 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed       : 4.59 KiB in (19.0 KiB/s), 756 out (3.06 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

scan -parallel

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp scan -parallel 5 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
source_vol/USER.1/FILE_5
source_vol/USER.1/file1.txt
source_vol/USER.1/file2.txt
source_vol/USER.1/logfile.txt
source_vol/USER.1/log1.txt
source_vol/r1.txt
source_vol/USER.1
source_vol/USER.2
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4

Xcp command : xcp scan -parallel 5 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed       : 4.59 KiB in (7.36 KiB/s), 756 out (1.19 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

scan -nold

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

```
[root@localhost /]# ./xcp scan -noId 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
```

```

source_vol/USER.1/FILE_5
source_vol/USER.1/file1.txt
source_vol/USER.1/file2.txt
source_vol/USER.1/logfile.txt
source_vol/USER.1/log1.txt
source_vol/r1.txt
source_vol/USER.1
source_vol/USER.2
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4

```

```

Xcp command : xcp scan -noId 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed      : 4.59 KiB in (5.84 KiB/s), 756 out (963/s)
Total Time : 0s.
STATUS     : PASSED

```

scan -subdir-names

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

```

[root@localhost /]# ./xcp scan -subdir-names 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol

Xcp command : xcp scan -subdir-names 172.21.88.54:/source_vol
7 scanned, 0 matched, 0 error
Speed      : 1.30 KiB in (1.21 KiB/s), 444 out (414/s)
Total Time : 1s.
STATUS     : PASSED

```

scan -acl4

Process NFS4 ACLs.

```

[root@localhost /]# ./xcp scan -acl4 172.21.88.54:/source_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

source_vol
source_vol/USER.1/FILE_1
source_vol/USER.1/FILE_2
source_vol/USER.1/FILE_3
source_vol/USER.1/FILE_4
source_vol/USER.1/FILE_5
source_vol/USER.1/file1.txt
source_vol/USER.1/file2.txt
source_vol/USER.1/logfile.txt
source_vol/USER.1/log1.txt
source_vol/r1.txt
source_vol/USER.1
source_vol/USER.2
source_vol/USER.2/FILE_1
source_vol/USER.2/FILE_5
source_vol/USER.2/FILE_2
source_vol/USER.2/FILE_3
source_vol/USER.2/FILE_4

Xcp command : xcp scan -acl4 172.21.88.54:/source_vol
18 scanned, 0 matched, 0 error
Speed      : 4.59 KiB in (9.12 KiB/s), 756 out (1.47 KiB/s)
Total Time : 0s.
STATUS     : PASSED

```

5.6 copy

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

Notes:

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

Syntax

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

Example

```
[root@localhost /]# ./xcp copy 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.46.33.153705

Xcp command : xcp copy 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 38.9 KiB in (51.2 KiB/s), 81.2 KiB out (107 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

Parameters

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

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

copy -md5

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

```
[root@localhost /]# ./xcp copy -md5 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.47.41.137615

Xcp command : xcp copy -md5 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 38.9 KiB in (52.1 KiB/s), 81.3 KiB out (109 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

copy -edupe

Include deduplication estimate in reports.

```
[root@localhost /]# ./xcp copy -edupe 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
```

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.48.10.436325

== Maximum Values ==

| Size | Used | Depth | Namelen | Dirsize |
|-------|-------|-------|---------|---------|
| 1 KiB | 4 KiB | 2 | 11 | 9 |

== Average Values ==

| Namelen | Size | Depth | Dirsize |
|---------|------|-------|---------|
| 6 | 682 | 1 | 5 |

== Top Space Users ==

| |
|--------|
| root |
| 52 KiB |

== Top File Owners ==

| |
|------|
| root |
| 18 |

== Top File Extensions ==

| | |
|------|-------|
| .txt | other |
| 5 | 10 |

== Number of files ==

| | | | | | | |
|-------|-------|---------|------------|---------|-----------|---------|
| empty | <8KiB | 8-64KiB | 64KiB-1MiB | 1-10MiB | 10-100MiB | >100MiB |
| 4 | 11 | | | | | |

== Space used ==

| | | | | | | |
|-------|--------|---------|------------|---------|-----------|---------|
| empty | <8KiB | 8-64KiB | 64KiB-1MiB | 1-10MiB | 10-100MiB | >100MiB |
| | 40 KiB | | | | | |

== Directory entries ==

| | | | | | |
|-------|------|--------|--------|--------|------|
| empty | 1-10 | 10-100 | 100-1K | 1K-10K | >10K |
| | 3 | | | | |

== Depth ==

| | | | | | |
|-----|------|-------|-------|--------|------|
| 0-5 | 6-10 | 11-15 | 16-20 | 21-100 | >100 |
| 18 | | | | | |

== Accessed ==

| | | | | | | |
|---------|----------|-----------|----------|---------|----------|--------|
| >1 year | >1 month | 1-31 days | 1-24 hrs | <1 hour | <15 mins | future |
| | | | | 4 | 11 | |

== Modified ==

| | | | | | | |
|---------|----------|-----------|----------|---------|----------|--------|
| >1 year | >1 month | 1-31 days | 1-24 hrs | <1 hour | <15 mins | future |
| | | | 10 | 5 | | |

== Changed ==

| | | | | | | |
|---------|----------|-----------|----------|---------|----------|--------|
| >1 year | >1 month | 1-31 days | 1-24 hrs | <1 hour | <15 mins | future |
| | | | 10 | 5 | | |

Total count: 18

Directories: 3

Regular files: 15

Symbolic links: None

Special files: None

Hard links: None,

multilink files: None,

Space Saved by Hard links (KB): 0

Sparse data: None

Dedupe estimate: N/A

Total space for regular files: size: 10.0 KiB, used: 40 KiB

Total space for symlinks: size: 0, used: 0

Total space for directories: size: 12 KiB, used: 12 KiB

Total space used: 52 KiB

Xcp command : xcp copy -edupe 172.21.88.54:/source_vol 172.21.88.70:/dest_vol

18 scanned, 0 matched, 17 copied, 0 error

Speed : 38.9 KiB in (36.7 KiB/s), 81.3 KiB out (76.7 KiB/s)

Total Time : 1s.

STATUS : PASSED

copy -nonames

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

```
[root@localhost /]# ./xcp copy -nonames 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.48.48.147261

Xcp command : xcp copy -nonames 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 38.9 KiB in (53.5 KiB/s), 81.3 KiB out (112 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

copy -bs <n[k]>

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

```
[root@localhost /]# ./xcp copy -bs 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.57.04.742145

Xcp command : xcp copy -bs 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 39.1 KiB in (115 KiB/s), 81.6 KiB out (241 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

copy -dircount <n[k]>

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

```
[root@localhost /]# ./xcp copy -dircount 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.58.01.094460

Xcp command : xcp copy -dircount 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 39.1 KiB in (56.7 KiB/s), 81.6 KiB out (119 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

copy -parallel <n>

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp copy -parallel 4 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-03_23.59.41.477783

Xcp command : xcp copy -parallel 4 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 39.1 KiB in (35.6 KiB/s), 81.6 KiB out (74.4 KiB/s)
Total Time  : 1s.
STATUS      : PASSED
```

copy -match <n>

Only process files and directories that match the filter.

```
[root@localhost /]# ./xcp copy -match bin 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_copy_2020-03-04_00.00.07.125990

Xcp command : xcp copy -match bin 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 18 matched, 17 copied, 0 error
Speed       : 39.1 KiB in (52.6 KiB/s), 81.7 KiB out (110 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

copy -acl4

Process NFS4 ACLs.

```
[root@localhost /]# ./xcp copy -acl4 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autaname_copy_2020-03-04_00.00.44.036904

Xcp command : xcp copy -acl4 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
18 scanned, 0 matched, 17 copied, 0 error
Speed       : 39.1 KiB in (37.0 KiB/s), 81.7 KiB out (77.5 KiB/s)
Total Time  : 1s.
STATUS      : PASSED
```

5.7 sync

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

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

Syntax

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

Example

```
[root@localhost /]# ./xcp sync -id autaname_copy_2020-03-04_01.10.22.338436
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

Xcp command : xcp sync -id autaname_copy_2020-03-04_01.10.22.338436
0 scanned, 0 copied, 0 modification, 0 new item, 0 delete item, 0 error
Speed       : 26.4 KiB in (27.6 KiB/s), 22.7 KiB out (23.7 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

Parameters

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

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

sync -id and sync -nonames

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

```
[root@localhost /]# ./xcp sync -id ID001 -nonames
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}
```

```
Xcp command : xcp sync -id ID001 -nonames
0 scanned, 0 copied, 0 modification, 0 new item, 0 delete item, 0 error
Speed       : 26.4 KiB in (22.2 KiB/s), 22.3 KiB out (18.8 KiB/s)
Total Time  : 1s.
STATUS      : PASSED
```

sync -id and sync -bs

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

```
[root@localhost /]# ./xcp sync -id ID001 -bs 32k
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

Xcp command : xcp sync -id ID001 -bs 32k
0 scanned, 0 copied, 0 modification, 0 new item, 0 delete item, 0 error
Speed       : 25.3 KiB in (20.4 KiB/s), 21.0 KiB out (16.9 KiB/s)
Total Time  : 1s.
STATUS      : PASSED
```

sync -id and sync -dircount

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

```
[root@localhost /]# ./xcp sync -id ID001 -dircount 32k
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

Xcp command : xcp sync -id ID001 -dircount 32k
0 scanned, 0 copied, 0 modification, 0 new item, 0 delete item, 0 error
Speed       : 25.3 KiB in (27.8 KiB/s), 21.0 KiB out (23.0 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

sync -id and sync -parallel

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp sync -id ID001 -parallel 4
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

Xcp command : xcp sync -id ID001 -parallel 4
0 scanned, 0 copied, 0 modification, 0 new item, 0 delete item, 0 error
Speed       : 25.3 KiB in (20.6 KiB/s), 21.0 KiB out (17.1 KiB/s)
Total Time  : 1s.
STATUS      : PASSED
```

5.8 sync dry-run

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

Syntax

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

Example

```
[root@localhost /]# ./xcp sync dry-run -id ID001
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

Xcp command : xcp sync dry-run -id ID001
0 matched, 0 error
Speed       : 15.2 KiB in (46.5 KiB/s), 5.48 KiB out (16.7 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

Parameters

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

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

sync dry-run -id

Catalog name of a previous copy index.

```
[root@localhost /]# ./xcp sync dry-run -id ID001
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

Xcp command : xcp sync dry-run -id ID001
0 matched, 0 error
Speed       : 15.2 KiB in (21.7 KiB/s), 5.48 KiB out (7.81 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

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

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

```
[root@localhost /]# ./xcp sync dry-run -id ID001 -stats
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

4,895 reviewed, 43,163 checked at source, 12.8 MiB in (2.54 MiB/s), 5.49 MiB out (1.09 MiB/s),
5s
4,895 reviewed, 101,396 checked at source, 19.2 MiB in (1.29 MiB/s), 12.8 MiB out (1.47 MiB/s),
10s

Xcp command : xcp sync dry-run -id ID001 -stats
0 matched, 0 error
Speed       : 22.9 MiB in (1.74 MiB/s), 17.0 MiB out (1.29 MiB/s)
Total Time  : 13s.
STATUS      : PASSED
```

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

Print details about files and directories that changed.

```
[root@localhost /]# ./xcp sync dry-run -id ID001 -l
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}


Xcp command : xcp sync dry-run -id ID001 -l
0 matched, 0 error
Speed       : 15.2 KiB in (13.6 KiB/s), 5.48 KiB out (4.88 KiB/s)
Total Time  : 1s.
STATUS      : PASSED
```

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

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

```
[root@localhost /]# ./xcp sync dry-run -id ID001 -nonames
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}


Xcp command : xcp sync dry-run -id ID001 -nonames
0 matched, 0 error
Speed       : 15.2 KiB in (15.8 KiB/s), 5.48 KiB out (5.70 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

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

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

```
[root@localhost /]# ./xcp sync dry-run -id ID001 -dircount 32k
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}


Xcp command : xcp sync dry-run -id ID001 -dircount 32k
0 matched, 0 error
Speed       : 15.2 KiB in (32.5 KiB/s), 5.48 KiB out (11.7 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

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

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp sync dry-run -id ID001 -parallel 4
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}


Xcp command : xcp sync dry-run -id ID001 -parallel 4
0 matched, 0 error
Speed       : 15.2 KiB in (25.4 KiB/s), 5.48 KiB out (9.13 KiB/s)
Total Time  : 0s.
STATUS      : PASSED
```

5.9 resume

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

Syntax

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

Example

```
[root@localhost /]# ./xcp resume -id ID001
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

xcp: resume 'ID001': Reviewing the incomplete index...
xcp: diff 'ID001': Found 652 completed directories and 31 in progress
4,658 reviewed, 362 KiB in (258 KiB/s), 7.66 KiB out (5.46 KiB/s), 1s.
xcp: resume 'ID001': Starting second pass for the in-progress directories...
xcp: resume 'ID001': Resuming the in-progress directories...
xcp: resume 'ID001': Resumed command: copy {-newid: u'ID001'}
xcp: resume 'ID001': Current options: {-id: 'ID001'}
xcp: resume 'ID001': Merged options: {-id: 'ID001', -newid: u'ID001'}
xcp: resume 'ID001': Values marked with a * include operations before resume
28,866 scanned*, 9,565 copied*, 4,658 indexed*, 108 MiB in (21.6 MiB/s), 100.0 MiB out (20.0
MiB/s), 5s
44,761 scanned*, 16,440 copied*, 4,658 indexed*, 206 MiB in (19.3 MiB/s), 191 MiB out (17.9
MiB/s), 11s
44,761 scanned*, 20,795 copied*, 4,658 indexed*, 362 MiB in (31.3 MiB/s), 345 MiB out (30.8
MiB/s), 16s
44,761 scanned*, 25,985 copied*, 4,658 indexed*, 488 MiB in (25.2 MiB/s), 465 MiB out (24.0
MiB/s), 21s
44,761 scanned*, 31,044 copied*, 4,658 indexed*, 578 MiB in (17.9 MiB/s), 558 MiB out (18.6
MiB/s), 26s
54,838 scanned*, 36,980 copied*, 14,276 indexed*, 679 MiB in (20.2 MiB/s), 657 MiB out (19.8
MiB/s), 31s
67,123 scanned*, 42,485 copied*, 29,160 indexed*, 742 MiB in (12.5 MiB/s), 720 MiB out (12.4
MiB/s), 36s
79,681 scanned*, 49,863 copied*, 39,227 indexed*, 801 MiB in (11.8 MiB/s), 779 MiB out (11.7
MiB/s), 41s
79,681 scanned*, 56,273 copied*, 39,227 indexed*, 854 MiB in (10.6 MiB/s), 832 MiB out (10.6
MiB/s), 46s
79,681 scanned*, 62,593 copied*, 39,227 indexed*, 906 MiB in (10.2 MiB/s), 881 MiB out (9.70
MiB/s), 51s
84,577 scanned*, 68,000 copied*, 44,047 indexed*, 976 MiB in (14.0 MiB/s), 951 MiB out (14.1
MiB/s), 56s
86,737 scanned*, 72,738 copied*, 49,071 indexed*, 1.04 GiB in (17.8 MiB/s), 1.01 GiB out (17.5
MiB/s), 1m1s
89,690 scanned*, 77,440 copied*, 54,110 indexed*, 1.14 GiB in (20.5 MiB/s), 1.11 GiB out (20.1
MiB/s), 1m6s
110,311 scanned*, 84,497 copied*, 74,158 indexed*, 1.24 GiB in (20.3 MiB/s), 1.21 GiB out (20.4
MiB/s), 1m11s
114,726 scanned*, 91,285 copied*, 74,158 indexed*, 1.33 GiB in (17.9 MiB/s), 1.30 GiB out (17.6
MiB/s), 1m16s
114,726 scanned*, 97,016 copied*, 74,158 indexed*, 1.46 GiB in (26.6 MiB/s), 1.43 GiB out (26.6
MiB/s), 1m21s
118,743 scanned*, 100,577 copied*, 79,331 indexed*, 1.65 GiB in (40.1 MiB/s), 1.62 GiB out (39.3
MiB/s), 1m26s
122,180 scanned*, 106,572 copied*, 84,217 indexed*, 1.77 GiB in (24.7 MiB/s), 1.74 GiB out (25.0
MiB/s), 1m31s
124,724 scanned*, 111,727 copied*, 84,217 indexed*, 1.89 GiB in (22.8 MiB/s), 1.86 GiB out (22.5
MiB/s), 1m36s
128,268 scanned*, 114,686 copied*, 99,203 indexed*, 1.99 GiB in (21.1 MiB/s), 1.96 GiB out (21.2
MiB/s), 1m41s
134,630 scanned*, 118,217 copied*, 104,317 indexed*, 2.06 GiB in (13.8 MiB/s), 2.03 GiB out
(13.7 MiB/s), 1m46s
134,630 scanned*, 121,742 copied*, 109,417 indexed*, 2.10 GiB in (9.02 MiB/s), 2.07 GiB out
(9.30 MiB/s), 1m51s
134,630 scanned*, 126,057 copied*, 109,417 indexed*, 2.20 GiB in (21.0 MiB/s), 2.17 GiB out
(21.0 MiB/s), 1m56s
134,630 scanned*, 130,034 copied*, 114,312 indexed*, 2.36 GiB in (32.1 MiB/s), 2.33 GiB out
(31.8 MiB/s), 2m1s
```



```
Xcp command : xcp resume -id ID001
134,630 scanned*, 134,630 copied*, 0 modification, 0 new item, 0 delete item, 0 error
Speed       : 2.40 GiB in (19.7 MiB/s), 2.37 GiB out (19.5 MiB/s)
Total Time  : 2m4s.
STATUS      : PASSED
```

Parameters

The following table lists the `resume` parameters and their description.

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

`resume -id<name>` and `resume -bs`

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

```
[root@localhost /]# ./xcp resume -id ID001 -bs 32k
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

xcp: resume 'ID001': Reviewing the incomplete index...
xcp: diff 'ID001': Found 2,360 completed directories and 152 in progress
19,440 reviewed, 1.28 MiB in (898 KiB/s), 9.77 KiB out (6.71 KiB/s), 1s.
xcp: resume 'ID001': Starting second pass for the in-progress directories...
xcp: resume 'ID001': Resuming the in-progress directories...
xcp: resume 'ID001': Resumed command: copy {-newid: u'ID001'}
xcp: resume 'ID001': Current options: {-bs: '32k', -id: 'ID001'}
xcp: resume 'ID001': Merged options: {-bs: '32k', -id: 'ID001', -newid: u'ID001'}
xcp: resume 'ID001': Values marked with a * include operations before resume
44,242 scanned*, 24,132 copied*, 19,440 indexed*, 36.7 MiB in (7.34 MiB/s), 30.6 MiB out (6.12
MiB/s), 5s
59,558 scanned*, 30,698 copied*, 19,440 indexed*, 142 MiB in (20.9 MiB/s), 125 MiB out (18.8
MiB/s), 10s
59,558 scanned*, 35,234 copied*, 19,440 indexed*, 203 MiB in (12.1 MiB/s), 187 MiB out (12.2
MiB/s), 15s
59,558 scanned*, 40,813 copied*, 19,440 indexed*, 286 MiB in (16.5 MiB/s), 269 MiB out (16.5
MiB/s), 20s
65,126 scanned*, 46,317 copied*, 24,106 indexed*, 401 MiB in (22.9 MiB/s), 382 MiB out (22.5
MiB/s), 25s
69,214 scanned*, 53,034 copied*, 29,031 indexed*, 496 MiB in (19.0 MiB/s), 476 MiB out (18.7
MiB/s), 30s
85,438 scanned*, 60,627 copied*, 53,819 indexed*, 591 MiB in (18.9 MiB/s), 569 MiB out (18.5
MiB/s), 35s
94,647 scanned*, 66,948 copied*, 53,819 indexed*, 700 MiB in (21.6 MiB/s), 679 MiB out (21.9
MiB/s), 40s
94,647 scanned*, 73,632 copied*, 53,819 indexed*, 783 MiB in (16.5 MiB/s), 761 MiB out (16.4
MiB/s), 45s
99,683 scanned*, 80,541 copied*, 58,962 indexed*, 849 MiB in (13.0 MiB/s), 824 MiB out (12.4
MiB/s), 50s
99,683 scanned*, 84,911 copied*, 58,962 indexed*, 1013 MiB in (32.8 MiB/s), 991 MiB out (33.2
MiB/s), 55s
101,667 scanned*, 91,386 copied*, 73,849 indexed*, 1.06 GiB in (15.4 MiB/s), 1.04 GiB out (15.4
MiB/s), 1m0s
118,251 scanned*, 98,413 copied*, 89,168 indexed*, 1.13 GiB in (14.0 MiB/s), 1.11 GiB out (13.3
MiB/s), 1m5s
124,672 scanned*, 104,134 copied*, 89,168 indexed*, 1.25 GiB in (23.9 MiB/s), 1.22 GiB out (23.2
MiB/s), 1m10s
130,171 scanned*, 109,594 copied*, 94,016 indexed*, 1.38 GiB in (25.7 MiB/s), 1.35 GiB out (25.5
MiB/s), 1m15s
```

```

134,574 scanned*, 113,798 copied*, 94,016 indexed*, 1.52 GiB in (28.6 MiB/s), 1.48 GiB out (28.2
MiB/s), 1m20s
134,574 scanned*, 118,078 copied*, 94,016 indexed*, 1.64 GiB in (24.6 MiB/s), 1.61 GiB out (25.1
MiB/s), 1m25s
134,574 scanned*, 121,502 copied*, 94,016 indexed*, 1.80 GiB in (34.0 MiB/s), 1.77 GiB out (33.0
MiB/s), 1m30s
134,630 scanned*, 126,147 copied*, 104,150 indexed*, 1.88 GiB in (16.2 MiB/s), 1.86 GiB out
(17.5 MiB/s), 1m35s
134,630 scanned*, 131,830 copied*, 119,455 indexed*, 1.95 GiB in (13.6 MiB/s), 1.92 GiB out
(13.5 MiB/s), 1m41s

Xcp command : xcp resume -id ID001 -bs 32k
134,630 scanned*, 134,630 copied*, 0 modification, 0 new item, 0 delete item, 0 error
Speed      : 2.02 GiB in (19.9 MiB/s), 1.99 GiB out (19.7 MiB/s)
Total Time : 1m43s.
STATUS     : PASSED

```

resume -id and resume -dircount

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

```

[root@localhost /]# ./xcp resume -id ID001 -dircount 32k
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}

xcp: resume 'ID001': Reviewing the incomplete index...
xcp: diff 'ID001': Found 4,582 completed directories and 238 in progress
39,520 reviewed, 2.47 MiB in (1.49 MiB/s), 12.6 KiB out (7.62 KiB/s), 1s.
xcp: resume 'ID001': Starting second pass for the in-progress directories...
xcp: resume 'ID001': Resuming the in-progress directories...
xcp: resume 'ID001': Resumed command: copy {-newid: u'ID001'}
xcp: resume 'ID001': Current options: {-dircount: '32k', -id: 'ID001'}
xcp: resume 'ID001': Merged options: {-dircount: '32k', -id: 'ID001', -newid: u'ID001'}
xcp: resume 'ID001': Values marked with a * include operations before resume
76,626 scanned*, 43,825 copied*, 39,520 indexed*, 31.7 MiB in (6.33 MiB/s), 23.0 MiB out (4.60
MiB/s), 5s
79,751 scanned*, 49,942 copied*, 39,520 indexed*, 140 MiB in (21.7 MiB/s), 131 MiB out (21.5
MiB/s), 10s
79,751 scanned*, 55,901 copied*, 39,520 indexed*, 234 MiB in (18.8 MiB/s), 223 MiB out (18.3
MiB/s), 15s
79,751 scanned*, 61,764 copied*, 39,520 indexed*, 325 MiB in (18.0 MiB/s), 313 MiB out (17.9
MiB/s), 20s
84,791 scanned*, 68,129 copied*, 44,510 indexed*, 397 MiB in (14.3 MiB/s), 384 MiB out (14.2
MiB/s), 25s
94,698 scanned*, 74,741 copied*, 54,039 indexed*, 485 MiB in (17.4 MiB/s), 473 MiB out (17.8
MiB/s), 30s
99,734 scanned*, 80,110 copied*, 59,044 indexed*, 605 MiB in (24.1 MiB/s), 591 MiB out (23.7
MiB/s), 35s
104,773 scanned*, 86,288 copied*, 69,005 indexed*, 716 MiB in (22.2 MiB/s), 703 MiB out (22.3
MiB/s), 40s
110,076 scanned*, 93,265 copied*, 79,102 indexed*, 795 MiB in (15.8 MiB/s), 781 MiB out (15.5
MiB/s), 45s
121,341 scanned*, 100,077 copied*, 84,096 indexed*, 897 MiB in (20.4 MiB/s), 881 MiB out (19.9
MiB/s), 50s
125,032 scanned*, 105,712 copied*, 89,132 indexed*, 1003 MiB in (21.2 MiB/s), 985 MiB out (20.7
MiB/s), 55s
129,548 scanned*, 110,382 copied*, 89,132 indexed*, 1.14 GiB in (32.0 MiB/s), 1.12 GiB out (32.1
MiB/s), 1m0s
131,976 scanned*, 115,158 copied*, 94,221 indexed*, 1.23 GiB in (19.2 MiB/s), 1.21 GiB out (18.3
MiB/s), 1m5s
134,430 scanned*, 119,161 copied*, 94,221 indexed*, 1.37 GiB in (27.8 MiB/s), 1.35 GiB out (28.3
MiB/s), 1m10s
134,630 scanned*, 125,013 copied*, 109,402 indexed*, 1.47 GiB in (21.2 MiB/s), 1.45 GiB out
(21.4 MiB/s), 1m15s
134,630 scanned*, 129,301 copied*, 114,532 indexed*, 1.61 GiB in (29.4 MiB/s), 1.60 GiB out
(29.8 MiB/s), 1m20s
134,630 scanned*, 132,546 copied*, 124,445 indexed*, 1.69 GiB in (14.8 MiB/s), 1.67 GiB out
(15.0 MiB/s), 1m25s

Xcp command : xcp resume -id ID001 -dircount 32k
134,630 scanned*, 134,630 copied*, 0 modification, 0 new item, 0 delete item, 0 error
Speed      : 1.70 GiB in (19.7 MiB/s), 1.69 GiB out (19.5 MiB/s)

```

```
Total Time : 1m28s.  
STATUS : PASSED
```

resume -id and resume -parallel

Maximum concurrent batch processes (default: 7).

```
[root@localhost /]# ./xcp resume -id ID001 -parallel 3  
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029  
  
xcp: Index: {source: 172.21.88.54:/source_vol, target: 172.21.88.70:/dest_vol}  
  
xcp: resume 'ID001': Reviewing the incomplete index...  
xcp: diff 'ID001': Found 2,347 completed directories and 149 in progress  
19,399 reviewed, 1.28 MiB in (659 KiB/s), 9.77 KiB out (4.93 KiB/s), 1s.  
xcp: resume 'ID001': Starting second pass for the in-progress directories...  
xcp: resume 'ID001': Resuming the in-progress directories...  
xcp: resume 'ID001': Resumed command: copy {-newid: u'ID001'}  
xcp: resume 'ID001': Current options: {-id: 'ID001', -parallel: 3}  
xcp: resume 'ID001': Merged options: {-id: 'ID001', -newid: u'ID001', -parallel: 3}  
xcp: resume 'ID001': Values marked with a * include operations before resume  
39,610 scanned*, 23,642 copied*, 19,399 indexed*, 56.3 MiB in (11.2 MiB/s), 45.8 MiB out (9.15  
MiB/s), 5s  
39,610 scanned*, 28,980 copied*, 19,399 indexed*, 145 MiB in (17.6 MiB/s), 134 MiB out (17.6  
MiB/s), 10s  
48,111 scanned*, 34,782 copied*, 34,042 indexed*, 223 MiB in (15.8 MiB/s), 212 MiB out (15.7  
MiB/s), 15s  
55,412 scanned*, 40,468 copied*, 34,042 indexed*, 317 MiB in (18.4 MiB/s), 304 MiB out (18.1  
MiB/s), 21s  
59,639 scanned*, 46,980 copied*, 39,032 indexed*, 390 MiB in (14.6 MiB/s), 377 MiB out (14.5  
MiB/s), 26s  
69,520 scanned*, 55,251 copied*, 49,006 indexed*, 438 MiB in (9.59 MiB/s), 423 MiB out (9.21  
MiB/s), 31s  
78,596 scanned*, 62,054 copied*, 59,001 indexed*, 492 MiB in (10.7 MiB/s), 476 MiB out (10.6  
MiB/s), 36s  
79,673 scanned*, 68,163 copied*, 59,001 indexed*, 610 MiB in (23.5 MiB/s), 593 MiB out (23.5  
MiB/s), 41s  
84,600 scanned*, 74,238 copied*, 64,150 indexed*, 723 MiB in (22.5 MiB/s), 705 MiB out (22.3  
MiB/s), 46s  
94,525 scanned*, 80,754 copied*, 74,157 indexed*, 807 MiB in (16.7 MiB/s), 788 MiB out (16.4  
MiB/s), 51s  
94,525 scanned*, 85,119 copied*, 74,157 indexed*, 1007 MiB in (39.9 MiB/s), 988 MiB out (39.9  
MiB/s), 56s  
109,514 scanned*, 93,474 copied*, 89,192 indexed*, 1.08 GiB in (20.7 MiB/s), 1.06 GiB out (20.2  
MiB/s), 1m1s  
111,953 scanned*, 100,639 copied*, 94,248 indexed*, 1.18 GiB in (19.3 MiB/s), 1.16 GiB out (19.2  
MiB/s), 1m6s  
114,605 scanned*, 105,958 copied*, 94,248 indexed*, 1.36 GiB in (36.8 MiB/s), 1.34 GiB out (36.6  
MiB/s), 1m11s  
124,531 scanned*, 112,340 copied*, 104,275 indexed*, 1.51 GiB in (29.8 MiB/s), 1.48 GiB out  
(29.4 MiB/s), 1m16s  
129,694 scanned*, 117,218 copied*, 109,236 indexed*, 1.67 GiB in (33.2 MiB/s), 1.65 GiB out  
(33.1 MiB/s), 1m21s  
131,753 scanned*, 123,850 copied*, 114,358 indexed*, 1.80 GiB in (25.9 MiB/s), 1.77 GiB out  
(25.9 MiB/s), 1m26s  
134,630 scanned*, 130,829 copied*, 124,437 indexed*, 1.85 GiB in (11.2 MiB/s), 1.83 GiB out  
(11.2 MiB/s), 1m31s  
  
Xcp command : xcp resume -id ID001 -parallel 3  
134,630 scanned*, 134,630 copied*, 0 modification, 0 new item, 0 delete item, 0 error  
Speed : 2.02 GiB in (21.6 MiB/s), 2.00 GiB out (21.3 MiB/s)  
Total Time : 1m35s.  
STATUS : PASSED
```

5.10 verify

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

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

Syntax

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

Example

```
[root@localhost /]# ./xcp verify 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autaname_verify_2020-03-04_23.54.40.893449
32,493 scanned, 11,303 found, 7,100 compared, 7,100 same data, 374 MiB in (74.7 MiB/s), 4.74 MiB out (971 KiB/s), 5s
40,109 scanned, 24,208 found, 18,866 compared, 18,866 same data, 834 MiB in (91.5 MiB/s), 10.5 MiB out (1.14 MiB/s), 10s
56,030 scanned, 14,623 indexed, 33,338 found, 27,624 compared, 27,624 same data, 1.31 GiB in (101 MiB/s), 15.9 MiB out (1.07 MiB/s), 15s
73,938 scanned, 34,717 indexed, 45,583 found, 38,909 compared, 38,909 same data, 1.73 GiB in (86.3 MiB/s), 22.8 MiB out (1.38 MiB/s), 20s
76,308 scanned, 39,719 indexed, 61,810 found, 54,885 compared, 54,885 same data, 2.04 GiB in (62.8 MiB/s), 30.2 MiB out (1.48 MiB/s), 25s
103,852 scanned, 64,606 indexed, 77,823 found, 68,301 compared, 68,301 same data, 2.31 GiB in (56.0 MiB/s), 38.2 MiB out (1.60 MiB/s), 30s
110,047 scanned, 69,579 indexed, 89,082 found, 78,794 compared, 78,794 same data, 2.73 GiB in (85.6 MiB/s), 43.6 MiB out (1.06 MiB/s), 35s
113,871 scanned, 79,650 indexed, 99,657 found, 89,093 compared, 89,093 same data, 3.23 GiB in (103 MiB/s), 49.3 MiB out (1.14 MiB/s), 40s
125,092 scanned, 94,616 indexed, 110,406 found, 98,369 compared, 98,369 same data, 3.74 GiB in (103 MiB/s), 55.0 MiB out (1.15 MiB/s), 45s
134,630 scanned, 104,764 indexed, 120,506 found, 106,732 compared, 106,732 same data, 4.23 GiB in (99.9 MiB/s), 60.4 MiB out (1.05 MiB/s), 50s
134,630 scanned, 114,823 indexed, 129,832 found, 116,198 compared, 116,198 same data, 4.71 GiB in (97.2 MiB/s), 65.5 MiB out (1.04 MiB/s), 55s

Xcp command : xcp verify 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0 different item, 0 error
Speed      : 4.95 GiB in (86.4 MiB/s), 69.2 MiB out (1.18 MiB/s)
Total Time : 58s.
STATUS     : PASSED
```

The following table lists the `verify` parameters and their description.

| Feature | Description |
|--|---|
| <code>verify -stats</code> | Scan source and target trees in parallel and compare tree statistics. |
| <code>verify -csv</code> | Scan source and target trees in parallel and compare tree statistics. |
| <code>verify -nodata</code> | Do not check data. |
| <code>verify -noattrs</code> | Do not check attributes. |
| <code>verify -nomods</code> | Do not check file modification times. |
| <code>verify -mtimewindow <s></code> | Acceptable modification time difference for verification. |
| <code>verify -v</code> | Output formats to list any differences found. |
| <code>verify -l</code> | Output formats to list any differences found. |
| <code>verify -nonames</code> | Do not look up user and group names for file listings or reports. |
| <code>verify -match <filter></code> | Only process files and directories that match the filter. |
| <code>verify -bs <n[k]></code> | Read/write blocksize (default: 64k). |

| Feature | Description |
|---|---|
| <code>.verify -parallel <n></code> | Maximum concurrent batch processes (default: 7). |
| <code>.verify -dircount <n[k]></code> | Request size for reading directories (default: 64k). |
| <code>.verify -newdata <id name></code> | Verify full structure, names, and attributes plus new data from the last sync |
| <code>.verify -noId</code> | Disable the creation of a default index (default: False) |
| <code>.Verify -acl4</code> | Process NFS4 ACLs |

verify -stats

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

```
[root@localhost /]# ./xcp verify -stats 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

228,609 scanned, 49.7 MiB in (9.93 MiB/s), 3.06 MiB out (625 KiB/s), 5s

== Number of files ==
empty    <8KiB    8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB
235      73,916   43,070   4,020     129     15
same     same     same     same      same     same

== Directory entries ==
empty    1-10    10-100  100-1K  1K-10K  >10K
3        10,300  2,727   67      11
same     same    same    same    same

== Depth ==
0-5      6-10    11-15   16-20   21-100  >100
47,120   79,772  7,608   130
same     same    same    same

== Modified ==
>1 year  >1 month 1-31 days 1-24 hrs <1 hour <15 mins future
15       116,121  5,249
same     same    same

Total count: 134,630 / same
Directories: 13,108 / same
Regular files: 121,385 / same
Symbolic links: 137 / same
Special files: None / same
Hard links: None / same, Multilink files: None / same

Xcp command : xcp verify -stats 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
269,260 scanned, 0 matched, 0 error
Speed      : 59.5 MiB in (7.44 MiB/s), 3.94 MiB out (506 KiB/s)
Total Time : 7s.
STATUS     : PASSED
```

verify -csv

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

```
[root@localhost /]# ./xcp verify -csv 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

222,028 scanned, 48.2 MiB in (9.63 MiB/s), 2.95 MiB out (603 KiB/s), 5s

== Number of files ==
empty    <8KiB    8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB
235      73,916   43,070   4,020     129     15
same     same     same     same      same     same

== Directory entries ==
empty    1-10    10-100  100-1K  1K-10K  >10K
3        10,300  2,727   67      11
same     same    same    same    same
```

```

== Depth ==
      0-5      6-10      11-15      16-20      21-100      >100
47,120    79,772    7,608      130
      same      same      same      same

== Modified ==
>1 year  >1 month  1-31 days  1-24 hrs  <1 hour  <15 mins  future
              15      121,370
              same      same

Total count: 134,630 / same
Directories: 13,108 / same
Regular files: 121,385 / same
Symbolic links: 137 / same
Special files: None / same
Hard links: None / same, Multilink files: None / same

Xcp command : xcp verify -csv 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
269,260 scanned, 0 matched, 0 error
Speed      : 59.5 MiB in (7.53 MiB/s), 3.94 MiB out (512 KiB/s)
Total Time : 7s.
STATUS     : PASSED

```

verify -stats and verify -csv

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

```

[root@localhost /]# ./xcp verify -stats -csv 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

224,618 scanned, 48.7 MiB in (9.54 MiB/s), 2.98 MiB out (597 KiB/s), 5s

== Number of files ==
      empty      <8KiB      8-64KiB  64KiB-1MiB      1-10MiB  10-100MiB      >100MiB
235      73,916    43,070    4,020      129      15
      same      same      same      same      same      same

== Directory entries ==
      empty      1-10      10-100      100-1K      1K-10K      >10K
3      10,300    2,727      67      11
      same      same      same      same      same

== Depth ==
      0-5      6-10      11-15      16-20      21-100      >100
47,120    79,772    7,608      130
      same      same      same      same

== Modified ==
>1 year  >1 month  1-31 days  1-24 hrs  <1 hour  <15 mins  future
              15      121,370
              same      same

Total count: 134,630 / same
Directories: 13,108 / same
Regular files: 121,385 / same
Symbolic links: 137 / same
Special files: None / same
Hard links: None / same, Multilink files: None / same

Xcp command : xcp verify -stats -csv 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
269,260 scanned, 0 matched, 0 error
Speed      : 59.5 MiB in (7.49 MiB/s), 3.94 MiB out (509 KiB/s)
Total Time : 7s.
STATUS     : PASSED

```

verify -nodata

Do not check data.

```

[root@localhost /]# ./xcp verify -nodata 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_02.18.01.159115

```

```

70,052 scanned, 29,795 indexed, 43,246 found, 25.8 MiB in (5.14 MiB/s), 9.39 MiB out (1.87
MiB/s), 5s
117,136 scanned, 94,723 indexed, 101,434 found, 50.3 MiB in (4.90 MiB/s), 22.4 MiB out (2.60
MiB/s), 10s

Xcp command : xcp verify -nodata 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (attrs, mods), 0
different item, 0 error
Speed       : 62.7 MiB in (4.65 MiB/s), 30.2 MiB out (2.24 MiB/s)
Total Time  : 13s.
STATUS      : PASSED

```

verify -noattrs

Do not check attributes.

```

[root@localhost /]# ./xcp verify -noattrs 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_02.19.14.011569
40,397 scanned, 9,917 found, 4,249 compared, 4,249 same data, 211 MiB in (41.6 MiB/s), 3.78 MiB
out (764 KiB/s), 5s
40,397 scanned, 14,533 found, 8,867 compared, 8,867 same data, 475 MiB in (52.9 MiB/s), 6.06 MiB
out (466 KiB/s), 10s
40,397 scanned, 20,724 found, 15,038 compared, 15,038 same data, 811 MiB in (67.0 MiB/s), 9.13
MiB out (628 KiB/s), 15s
40,397 scanned, 25,659 found, 19,928 compared, 19,928 same data, 1.02 GiB in (46.6 MiB/s), 11.5
MiB out (477 KiB/s), 20s
40,397 scanned, 30,535 found, 24,803 compared, 24,803 same data, 1.32 GiB in (62.0 MiB/s), 14.0
MiB out (513 KiB/s), 25s
75,179 scanned, 34,656 indexed, 39,727 found, 32,595 compared, 32,595 same data, 1.58 GiB in
(53.4 MiB/s), 20.1 MiB out (1.22 MiB/s), 30s
75,179 scanned, 34,656 indexed, 47,680 found, 40,371 compared, 40,371 same data, 1.74 GiB in
(32.3 MiB/s), 23.6 MiB out (717 KiB/s), 35s
75,179 scanned, 34,656 indexed, 58,669 found, 51,524 compared, 51,524 same data, 1.93 GiB in
(37.9 MiB/s), 28.4 MiB out (989 KiB/s), 40s
78,097 scanned, 39,772 indexed, 69,343 found, 61,858 compared, 61,858 same data, 2.12 GiB in
(39.0 MiB/s), 33.4 MiB out (1015 KiB/s), 45s
110,213 scanned, 69,593 indexed, 80,049 found, 69,565 compared, 69,565 same data, 2.37 GiB in
(51.3 MiB/s), 39.3 MiB out (1.18 MiB/s), 50s
110,213 scanned, 69,593 indexed, 86,233 found, 75,727 compared, 75,727 same data, 2.65 GiB in
(57.8 MiB/s), 42.3 MiB out (612 KiB/s), 55s
110,213 scanned, 69,593 indexed, 93,710 found, 83,218 compared, 83,218 same data, 2.93 GiB in
(56.1 MiB/s), 45.8 MiB out (705 KiB/s), 1m0s
110,213 scanned, 69,593 indexed, 99,700 found, 89,364 compared, 89,364 same data, 3.20 GiB in
(56.9 MiB/s), 48.7 MiB out (593 KiB/s), 1m5s
124,888 scanned, 94,661 indexed, 107,509 found, 95,304 compared, 95,304 same data, 3.54 GiB in
(68.6 MiB/s), 53.5 MiB out (1000 KiB/s), 1m10s
134,630 scanned, 104,739 indexed, 116,494 found, 102,792 compared, 102,792 same data, 3.94 GiB
in (81.7 MiB/s), 58.2 MiB out (949 KiB/s), 1m15s
134,630 scanned, 104,739 indexed, 123,475 found, 109,601 compared, 109,601 same data, 4.28 GiB
in (70.0 MiB/s), 61.7 MiB out (711 KiB/s), 1m20s
134,630 scanned, 104,739 indexed, 129,354 found, 115,295 compared, 115,295 same data, 4.55 GiB
in (55.3 MiB/s), 64.5 MiB out (572 KiB/s), 1m25s

Xcp command : xcp verify -noattrs 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, mods), 0
different item, 0 error
Speed       : 4.95 GiB in (56.5 MiB/s), 69.2 MiB out (789 KiB/s)
Total Time  : 1m29s.
STATUS      : PASSED

```

verify -nomods

Do not check file modification times.

```

[root@localhost /]# ./xcp verify -nomods 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_02.22.33.738593
40,371 scanned, 10,859 found, 5,401 compared, 5,401 same data, 296 MiB in (59.1 MiB/s), 4.29 MiB
out (876 KiB/s), 5s
40,371 scanned, 22,542 found, 17,167 compared, 17,167 same data, 743 MiB in (88.9 MiB/s), 9.67
MiB out (1.07 MiB/s), 10s

```

```

43,521 scanned, 4,706 indexed, 32,166 found, 26,676 compared, 26,676 same data, 1.17 GiB in
(91.3 MiB/s), 14.5 MiB out (996 KiB/s), 15s
70,260 scanned, 29,715 indexed, 43,680 found, 37,146 compared, 37,146 same data, 1.64 GiB in
(96.0 MiB/s), 21.5 MiB out (1.38 MiB/s), 20s
75,160 scanned, 34,722 indexed, 60,079 found, 52,820 compared, 52,820 same data, 2.01 GiB in
(74.4 MiB/s), 29.1 MiB out (1.51 MiB/s), 25s
102,874 scanned, 69,594 indexed, 77,322 found, 67,907 compared, 67,907 same data, 2.36 GiB in
(71.2 MiB/s), 38.3 MiB out (1.85 MiB/s), 30s
110,284 scanned, 69,594 indexed, 89,143 found, 78,952 compared, 78,952 same data, 2.82 GiB in
(92.8 MiB/s), 43.9 MiB out (1.08 MiB/s), 35s
112,108 scanned, 79,575 indexed, 100,228 found, 89,856 compared, 89,856 same data, 3.25 GiB in
(89.3 MiB/s), 49.6 MiB out (1.15 MiB/s), 40s
128,122 scanned, 99,743 indexed, 111,358 found, 98,663 compared, 98,663 same data, 3.80 GiB in
(112 MiB/s), 55.8 MiB out (1.24 MiB/s), 45s
134,630 scanned, 104,738 indexed, 123,253 found, 109,472 compared, 109,472 same data, 4.36 GiB
in (114 MiB/s), 61.7 MiB out (1.16 MiB/s), 50s
134,630 scanned, 119,809 indexed, 133,569 found, 120,008 compared, 120,008 same data, 4.94 GiB
in (115 MiB/s), 67.8 MiB out (1.20 MiB/s), 55s

Xcp command : xcp verify -nomods 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs), 0
different item, 0 error
Speed       : 4.95 GiB in (90.5 MiB/s), 69.2 MiB out (1.24 MiB/s)
Total Time  : 56s.
STATUS      : PASSED

```

verify -mtimewindow <s>

Acceptable modification time difference for verification.

```

[root@localhost /]# ./xcp verify -mtimewindow 2 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
06_02.26.03.797492
27,630 scanned, 9,430 found, 5,630 compared, 5,630 same data, 322 MiB in (64.1 MiB/s), 3.91 MiB
out (798 KiB/s), 5s
38,478 scanned, 19,840 found, 14,776 compared, 14,776 same data, 811 MiB in (97.8 MiB/s), 8.86
MiB out (1012 KiB/s), 10s
55,304 scanned, 14,660 indexed, 29,893 found, 23,904 compared, 23,904 same data, 1.33 GiB in
(109 MiB/s), 14.6 MiB out (1.14 MiB/s), 15s
64,758 scanned, 24,700 indexed, 43,133 found, 36,532 compared, 36,532 same data, 1.65 GiB in
(65.3 MiB/s), 21.0 MiB out (1.28 MiB/s), 20s
75,317 scanned, 34,655 indexed, 56,020 found, 48,942 compared, 48,942 same data, 2.01 GiB in
(72.5 MiB/s), 27.4 MiB out (1.25 MiB/s), 25s
95,024 scanned, 54,533 indexed, 70,675 found, 61,886 compared, 61,886 same data, 2.41 GiB in
(81.3 MiB/s), 34.9 MiB out (1.49 MiB/s), 30s
102,407 scanned, 64,598 indexed, 85,539 found, 76,158 compared, 76,158 same data, 2.74 GiB in
(67.3 MiB/s), 42.0 MiB out (1.42 MiB/s), 35s
113,209 scanned, 74,661 indexed, 97,126 found, 86,525 compared, 86,525 same data, 3.09 GiB in
(72.6 MiB/s), 48.0 MiB out (1.19 MiB/s), 40s
125,040 scanned, 84,710 indexed, 108,480 found, 96,253 compared, 96,253 same data, 3.51 GiB in
(84.0 MiB/s), 53.6 MiB out (1.10 MiB/s), 45s
132,726 scanned, 99,775 indexed, 117,252 found, 103,740 compared, 103,740 same data, 4.04 GiB in
(108 MiB/s), 58.4 MiB out (986 KiB/s), 50s
134,633 scanned, 109,756 indexed, 126,700 found, 112,978 compared, 112,978 same data, 4.52 GiB
in (97.6 MiB/s), 63.6 MiB out (1.03 MiB/s), 55s
134,633 scanned, 129,807 indexed, 134,302 found, 120,779 compared, 120,779 same data, 4.95 GiB
in (86.5 MiB/s), 68.8 MiB out (1.02 MiB/s), 1m0s

Xcp command : xcp verify -mtimewindow 2 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,633 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed       : 4.95 GiB in (83.6 MiB/s), 69.2 MiB out (1.14 MiB/s)
Total Time  : 1m0s.
STATUS      : PASSED

```

verify -v

Output formats to list any differences found.

```

[root@localhost /]# ./xcp verify -v 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_02.26.30.055115

```



```

32,349 scanned, 10,211 found, 5,946 compared, 5,946 same data, 351 MiB in (70.1 MiB/s), 4.27 MiB
out (872 KiB/s), 5s
40,301 scanned, 21,943 found, 16,619 compared, 16,619 same data, 874 MiB in (104 MiB/s), 9.74
MiB out (1.09 MiB/s), 10s
52,201 scanned, 14,512 indexed, 33,173 found, 27,622 compared, 27,622 same data, 1.35 GiB in
(102 MiB/s), 16.0 MiB out (1.24 MiB/s), 15s
70,886 scanned, 34,689 indexed, 46,699 found, 40,243 compared, 40,243 same data, 1.77 GiB in
(86.2 MiB/s), 23.3 MiB out (1.47 MiB/s), 20s
80,072 scanned, 39,708 indexed, 63,333 found, 55,743 compared, 55,743 same data, 2.04 GiB in
(55.4 MiB/s), 31.0 MiB out (1.54 MiB/s), 25s
100,034 scanned, 59,615 indexed, 76,848 found, 67,738 compared, 67,738 same data, 2.35 GiB in
(61.6 MiB/s), 37.6 MiB out (1.31 MiB/s), 30s
110,290 scanned, 69,597 indexed, 88,493 found, 78,203 compared, 78,203 same data, 2.75 GiB in
(81.7 MiB/s), 43.4 MiB out (1.14 MiB/s), 35s
116,829 scanned, 79,603 indexed, 102,105 found, 90,998 compared, 90,998 same data, 3.32 GiB in
(117 MiB/s), 50.3 MiB out (1.38 MiB/s), 40s
128,954 scanned, 94,650 indexed, 114,340 found, 101,563 compared, 101,563 same data, 3.91 GiB in
(121 MiB/s), 56.8 MiB out (1.30 MiB/s), 45s
134,630 scanned, 109,858 indexed, 125,760 found, 112,077 compared, 112,077 same data, 4.41 GiB
in (99.9 MiB/s), 63.0 MiB out (1.22 MiB/s), 50s

Xcp command : xcp verify -v 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.95 GiB in (91.7 MiB/s), 69.2 MiB out (1.25 MiB/s)
Total Time : 55s.
STATUS     : PASSED

```

verify -l

Output formats to list any differences found.

```

[root@localhost /]# ./xcp verify -l 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autaname_verify_2020-03-
05_02.27.58.969228
32,044 scanned, 11,565 found, 7,305 compared, 7,305 same data, 419 MiB in (83.7 MiB/s), 4.93 MiB
out (1008 KiB/s), 5s
40,111 scanned, 21,352 found, 16,008 compared, 16,008 same data, 942 MiB in (104 MiB/s), 9.64
MiB out (962 KiB/s), 10s
53,486 scanned, 14,677 indexed, 30,840 found, 25,162 compared, 25,162 same data, 1.34 GiB in
(86.4 MiB/s), 15.0 MiB out (1.07 MiB/s), 15s
71,202 scanned, 34,646 indexed, 45,082 found, 38,555 compared, 38,555 same data, 1.72 GiB in
(76.7 MiB/s), 22.5 MiB out (1.51 MiB/s), 20s
75,264 scanned, 34,646 indexed, 60,039 found, 53,099 compared, 53,099 same data, 2.00 GiB in
(58.5 MiB/s), 29.1 MiB out (1.30 MiB/s), 25s
95,205 scanned, 54,684 indexed, 76,004 found, 67,054 compared, 67,054 same data, 2.34 GiB in
(67.5 MiB/s), 37.0 MiB out (1.57 MiB/s), 30s
110,239 scanned, 69,664 indexed, 87,892 found, 77,631 compared, 77,631 same data, 2.78 GiB in
(89.7 MiB/s), 43.2 MiB out (1.23 MiB/s), 35s
115,192 scanned, 79,627 indexed, 100,246 found, 89,450 compared, 89,450 same data, 3.22 GiB in
(90.0 MiB/s), 49.4 MiB out (1.24 MiB/s), 40s
122,694 scanned, 89,740 indexed, 109,158 found, 97,422 compared, 97,422 same data, 3.65 GiB in
(89.4 MiB/s), 54.2 MiB out (978 KiB/s), 45s
134,630 scanned, 104,695 indexed, 119,683 found, 106,036 compared, 106,036 same data, 4.17 GiB
in (105 MiB/s), 59.9 MiB out (1.11 MiB/s), 50s
134,630 scanned, 109,813 indexed, 129,117 found, 115,432 compared, 115,432 same data, 4.59 GiB
in (86.1 MiB/s), 64.7 MiB out (979 KiB/s), 55s

Xcp command : xcp verify -l 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.95 GiB in (84.9 MiB/s), 69.2 MiB out (1.16 MiB/s)
Total Time : 59s.
STATUS     : PASSED

```

verify -v and verify -l

Output formats to list any differences found.

```

[root@localhost /]# ./xcp verify -v -l 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autaname_verify_2020-03-
05_02.30.00.952454

```

```

24,806 scanned, 8,299 found, 4,817 compared, 4,817 same data, 296 MiB in (59.1 MiB/s), 3.44 MiB
out (704 KiB/s), 5s
39,720 scanned, 20,219 found, 14,923 compared, 14,923 same data, 716 MiB in (84.0 MiB/s), 8.78
MiB out (1.07 MiB/s), 10s
44,395 scanned, 9,648 indexed, 29,851 found, 24,286 compared, 24,286 same data, 1.20 GiB in (102
MiB/s), 14.0 MiB out (1.05 MiB/s), 15s
62,763 scanned, 24,725 indexed, 40,946 found, 34,760 compared, 34,760 same data, 1.69 GiB in
(101 MiB/s), 20.2 MiB out (1.24 MiB/s), 20s
76,181 scanned, 39,708 indexed, 57,566 found, 50,595 compared, 50,595 same data, 1.98 GiB in
(58.7 MiB/s), 28.3 MiB out (1.61 MiB/s), 25s
90,411 scanned, 49,594 indexed, 73,357 found, 64,912 compared, 64,912 same data, 2.37 GiB in
(79.0 MiB/s), 35.8 MiB out (1.48 MiB/s), 30s
110,222 scanned, 69,593 indexed, 87,733 found, 77,466 compared, 77,466 same data, 2.77 GiB in
(80.5 MiB/s), 43.1 MiB out (1.45 MiB/s), 35s
116,417 scanned, 79,693 indexed, 100,053 found, 89,258 compared, 89,258 same data, 3.23 GiB in
(94.3 MiB/s), 49.4 MiB out (1.26 MiB/s), 40s
122,224 scanned, 89,730 indexed, 111,684 found, 100,059 compared, 100,059 same data, 3.83 GiB in
(123 MiB/s), 55.5 MiB out (1.22 MiB/s), 45s
134,630 scanned, 109,758 indexed, 121,744 found, 108,152 compared, 108,152 same data, 4.36 GiB
in (107 MiB/s), 61.3 MiB out (1.14 MiB/s), 50s
134,630 scanned, 119,849 indexed, 131,678 found, 118,015 compared, 118,015 same data, 4.79 GiB
in (87.2 MiB/s), 66.7 MiB out (1.08 MiB/s), 55s

Xcp command : xcp verify -v -l 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.95 GiB in (87.6 MiB/s), 69.2 MiB out (1.20 MiB/s)
Total Time : 57s.
STATUS     : PASSED

```

verify -nonames

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

```

[root@localhost /]# ./xcp verify -nonames 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_04.03.58.173082
30,728 scanned, 9,242 found, 5,248 compared, 5,248 same data, 363 MiB in (72.6 MiB/s), 3.93 MiB
out (805 KiB/s), 5s
40,031 scanned, 20,748 found, 15,406 compared, 15,406 same data, 837 MiB in (94.5 MiB/s), 9.19
MiB out (1.05 MiB/s), 10s
50,859 scanned, 9,668 indexed, 32,410 found, 26,305 compared, 26,305 same data, 1.30 GiB in
(99.5 MiB/s), 15.2 MiB out (1.20 MiB/s), 15s
73,631 scanned, 34,712 indexed, 45,362 found, 38,567 compared, 38,567 same data, 1.75 GiB in
(92.2 MiB/s), 22.6 MiB out (1.49 MiB/s), 20s
82,931 scanned, 44,618 indexed, 59,988 found, 52,270 compared, 52,270 same data, 2.08 GiB in
(66.7 MiB/s), 29.6 MiB out (1.39 MiB/s), 25s
96,691 scanned, 59,630 indexed, 77,567 found, 68,573 compared, 68,573 same data, 2.50 GiB in
(85.2 MiB/s), 38.2 MiB out (1.73 MiB/s), 30s
110,763 scanned, 74,678 indexed, 92,246 found, 82,010 compared, 82,010 same data, 2.93 GiB in
(88.8 MiB/s), 45.5 MiB out (1.45 MiB/s), 35s
120,101 scanned, 79,664 indexed, 105,420 found, 94,046 compared, 94,046 same data, 3.47 GiB in
(110 MiB/s), 51.9 MiB out (1.27 MiB/s), 40s
131,659 scanned, 99,780 indexed, 116,418 found, 103,109 compared, 103,109 same data, 4.05 GiB in
(120 MiB/s), 58.1 MiB out (1.25 MiB/s), 45s
134,630 scanned, 114,770 indexed, 127,154 found, 113,483 compared, 113,483 same data, 4.54 GiB
in (100 MiB/s), 64.1 MiB out (1.20 MiB/s), 50s

Xcp command : xcp verify -nonames 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.95 GiB in (92.5 MiB/s), 69.2 MiB out (1.26 MiB/s)
Total Time : 54s.
STATUS     : PASSED

```

verify -match <filter>

Only process files and directories that match the filter.

```

[root@localhost /]# ./xcp verify -match bin 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_04.16.46.005121

```

```

32,245 scanned, 25,000 matched, 10,657 found, 6,465 compared, 6,465 same data, 347 MiB in (69.4
MiB/s), 4.44 MiB out (908 KiB/s), 5s
40,306 scanned, 35,000 matched, 21,311 found, 15,969 compared, 15,969 same data, 850 MiB in (101
MiB/s), 9.44 MiB out (1024 KiB/s), 10s
55,582 scanned, 45,000 matched, 14,686 indexed, 31,098 found, 25,293 compared, 25,293 same data,
1.33 GiB in (102 MiB/s), 15.1 MiB out (1.12 MiB/s), 15s
75,199 scanned, 65,000 matched, 34,726 indexed, 45,587 found, 38,738 compared, 38,738 same data,
1.72 GiB in (77.9 MiB/s), 22.7 MiB out (1.52 MiB/s), 20s
78,304 scanned, 70,000 matched, 39,710 indexed, 61,398 found, 54,232 compared, 54,232 same data,
2.08 GiB in (75.0 MiB/s), 30.0 MiB out (1.45 MiB/s), 25s
102,960 scanned, 95,000 matched, 69,682 indexed, 78,351 found, 69,034 compared, 69,034 same
data, 2.43 GiB in (71.9 MiB/s), 38.8 MiB out (1.76 MiB/s), 30s
110,344 scanned, 105,000 matched, 69,682 indexed, 93,873 found, 83,637 compared, 83,637 same
data, 2.85 GiB in (84.2 MiB/s), 45.6 MiB out (1.36 MiB/s), 35s
121,459 scanned, 120,000 matched, 84,800 indexed, 107,012 found, 95,357 compared, 95,357 same
data, 3.30 GiB in (92.8 MiB/s), 52.3 MiB out (1.33 MiB/s), 40s
130,006 scanned, 125,000 matched, 94,879 indexed, 115,077 found, 102,104 compared, 102,104 same
data, 3.97 GiB in (136 MiB/s), 57.2 MiB out (1001 KiB/s), 45s
134,630 scanned, 134,630 matched, 109,867 indexed, 125,755 found, 112,025 compared, 112,025 same
data, 4.53 GiB in (115 MiB/s), 63.2 MiB out (1.20 MiB/s), 50s

Xcp command : xcp verify -match bin 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 134,630 matched, 100% found (121,150 have data), 100% verified (data, attrs,
mods), 0 different item, 0 error
Speed      : 4.95 GiB in (92.2 MiB/s), 69.2 MiB out (1.26 MiB/s)
Total Time : 54s.
STATUS     : PASSED

```

verify -bs <n[k]>

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

```

[root@localhost /]# ./xcp verify -bs 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_04.20.19.266399
29,742 scanned, 9,939 found, 5,820 compared, 5,820 same data, 312 MiB in (62.3 MiB/s), 4.58 MiB
out (938 KiB/s), 5s
40,156 scanned, 20,828 found, 15,525 compared, 15,525 same data, 742 MiB in (85.0 MiB/s), 10.2
MiB out (1.10 MiB/s), 10s
41,906 scanned, 9,846 indexed, 30,731 found, 25,425 compared, 25,425 same data, 1.14 GiB in
(85.6 MiB/s), 16.1 MiB out (1.18 MiB/s), 15s
66,303 scanned, 29,712 indexed, 42,861 found, 36,708 compared, 36,708 same data, 1.61 GiB in
(94.9 MiB/s), 23.7 MiB out (1.53 MiB/s), 20s
70,552 scanned, 34,721 indexed, 58,157 found, 51,528 compared, 51,528 same data, 1.96 GiB in
(73.0 MiB/s), 31.4 MiB out (1.53 MiB/s), 25s
100,135 scanned, 59,611 indexed, 76,047 found, 66,811 compared, 66,811 same data, 2.29 GiB in
(66.3 MiB/s), 40.7 MiB out (1.82 MiB/s), 30s
105,951 scanned, 69,665 indexed, 90,022 found, 80,330 compared, 80,330 same data, 2.71 GiB in
(85.3 MiB/s), 48.1 MiB out (1.49 MiB/s), 35s
113,440 scanned, 89,486 indexed, 101,634 found, 91,152 compared, 91,152 same data, 3.19 GiB in
(97.8 MiB/s), 55.4 MiB out (1.45 MiB/s), 40s
128,693 scanned, 94,484 indexed, 109,999 found, 97,319 compared, 97,319 same data, 3.59 GiB in
(82.6 MiB/s), 60.2 MiB out (985 KiB/s), 45s
134,630 scanned, 94,484 indexed, 119,203 found, 105,402 compared, 105,402 same data, 3.98 GiB in
(78.3 MiB/s), 65.1 MiB out (986 KiB/s), 50s
134,630 scanned, 104,656 indexed, 127,458 found, 113,774 compared, 113,774 same data, 4.49 GiB
in (103 MiB/s), 70.8 MiB out (1.15 MiB/s), 55s

Xcp command : xcp verify -bs 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.96 GiB in (84.5 MiB/s), 77.5 MiB out (1.29 MiB/s)
Total Time : 1m0s.
STATUS     : PASSED

```

verify -dircount <n[k]>

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

```

[root@localhost /]# ./xcp verify -dircount 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_04.28.58.235953

```

```

32,221 scanned, 10,130 found, 5,955 compared, 5,955 same data, 312 MiB in (62.1 MiB/s), 4.15 MiB
out (848 KiB/s), 5s
40,089 scanned, 21,965 found, 16,651 compared, 16,651 same data, 801 MiB in (97.5 MiB/s), 9.55
MiB out (1.07 MiB/s), 10s
51,723 scanned, 14,544 indexed, 33,019 found, 27,288 compared, 27,288 same data, 1.24 GiB in
(93.8 MiB/s), 15.6 MiB out (1.22 MiB/s), 15s
67,360 scanned, 34,733 indexed, 45,615 found, 39,341 compared, 39,341 same data, 1.73 GiB in
(100 MiB/s), 22.8 MiB out (1.43 MiB/s), 20s
82,314 scanned, 44,629 indexed, 63,276 found, 55,559 compared, 55,559 same data, 2.05 GiB in
(64.7 MiB/s), 31.0 MiB out (1.63 MiB/s), 25s
100,085 scanned, 59,585 indexed, 79,799 found, 70,618 compared, 70,618 same data, 2.43 GiB in
(77.2 MiB/s), 38.9 MiB out (1.57 MiB/s), 30s
110,158 scanned, 69,651 indexed, 93,005 found, 82,654 compared, 82,654 same data, 2.87 GiB in
(89.1 MiB/s), 45.4 MiB out (1.28 MiB/s), 35s
120,047 scanned, 79,641 indexed, 104,539 found, 93,226 compared, 93,226 same data, 3.40 GiB in
(108 MiB/s), 51.4 MiB out (1.20 MiB/s), 40s
130,362 scanned, 94,662 indexed, 114,193 found, 101,230 compared, 101,230 same data, 3.87 GiB in
(97.3 MiB/s), 56.7 MiB out (1.06 MiB/s), 45s
134,630 scanned, 104,789 indexed, 124,272 found, 110,547 compared, 110,547 same data, 4.33 GiB
in (94.2 MiB/s), 62.3 MiB out (1.12 MiB/s), 50s
134,630 scanned, 129,879 indexed, 133,227 found, 119,717 compared, 119,717 same data, 4.93 GiB
in (119 MiB/s), 68.2 MiB out (1.17 MiB/s), 55s

Xcp command : xcp verify -dircount 32k 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.95 GiB in (89.3 MiB/s), 69.2 MiB out (1.22 MiB/s)
Total Time : 56s.
STATUS     : PASSED

```

verify -parallel <n>

Maximum concurrent batch processes (default: 7).

```

[root@localhost /]# ./xcp verify -parallel 2 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp: WARNING: No index name has been specified, creating one with name: autoname_verify_2020-03-
05_04.35.10.356405
15,021 scanned, 6,946 found, 4,869 compared, 4,869 same data, 378 MiB in (74.5 MiB/s), 3.24 MiB
out (654 KiB/s), 5s
25,165 scanned, 9,671 indexed, 15,945 found, 12,743 compared, 12,743 same data, 706 MiB in (65.4
MiB/s), 7.81 MiB out (934 KiB/s), 10s
35,367 scanned, 19,747 indexed, 24,036 found, 19,671 compared, 19,671 same data, 933 MiB in
(45.3 MiB/s), 11.9 MiB out (827 KiB/s), 15s
45,267 scanned, 29,761 indexed, 32,186 found, 26,909 compared, 26,909 same data, 1.38 GiB in
(94.6 MiB/s), 16.5 MiB out (943 KiB/s), 20s
55,690 scanned, 39,709 indexed, 40,413 found, 34,805 compared, 34,805 same data, 1.69 GiB in
(62.8 MiB/s), 20.9 MiB out (874 KiB/s), 25s
55,690 scanned, 39,709 indexed, 48,325 found, 42,690 compared, 42,690 same data, 1.88 GiB in
(38.1 MiB/s), 24.3 MiB out (703 KiB/s), 31s
65,002 scanned, 49,670 indexed, 57,872 found, 51,891 compared, 51,891 same data, 2.04 GiB in
(33.2 MiB/s), 29.0 MiB out (967 KiB/s), 36s
75,001 scanned, 59,688 indexed, 66,789 found, 60,291 compared, 60,291 same data, 2.11 GiB in
(14.8 MiB/s), 33.4 MiB out (883 KiB/s), 41s
85,122 scanned, 69,690 indexed, 75,009 found, 67,337 compared, 67,337 same data, 2.42 GiB in
(62.3 MiB/s), 37.6 MiB out (862 KiB/s), 46s
91,260 scanned, 79,686 indexed, 82,097 found, 73,854 compared, 73,854 same data, 2.69 GiB in
(55.0 MiB/s), 41.4 MiB out (770 KiB/s), 51s
95,002 scanned, 79,686 indexed, 88,238 found, 79,707 compared, 79,707 same data, 2.99 GiB in
(60.7 MiB/s), 44.4 MiB out (608 KiB/s), 56s
105,002 scanned, 89,787 indexed, 96,059 found, 86,745 compared, 86,745 same data, 3.19 GiB in
(41.3 MiB/s), 48.4 MiB out (810 KiB/s), 1m1s
110,239 scanned, 99,872 indexed, 104,757 found, 94,652 compared, 94,652 same data, 3.47 GiB in
(57.0 MiB/s), 52.7 MiB out (879 KiB/s), 1m6s
120,151 scanned, 104,848 indexed, 111,491 found, 100,317 compared, 100,317 same data, 3.95 GiB
in (97.2 MiB/s), 56.3 MiB out (733 KiB/s), 1m11s
130,068 scanned, 114,860 indexed, 119,867 found, 107,260 compared, 107,260 same data, 4.25 GiB
in (60.5 MiB/s), 60.6 MiB out (871 KiB/s), 1m16s
134,028 scanned, 119,955 indexed, 125,210 found, 111,886 compared, 111,886 same data, 4.65 GiB
in (83.2 MiB/s), 63.7 MiB out (647 KiB/s), 1m21s
134,630 scanned, 129,929 indexed, 132,679 found, 119,193 compared, 119,193 same data, 4.93 GiB
in (56.8 MiB/s), 67.9 MiB out (846 KiB/s), 1m26s

Xcp command : xcp verify -parallel 2 172.21.88.54:/source_vol 172.21.88.70:/dest_vol

```

```
134,630 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods), 0
different item, 0 error
Speed      : 4.95 GiB in (57.8 MiB/s), 69.1 MiB out (807 KiB/s)
Total Time : 1m27s.
STATUS     : PASSED
```

verify -acl4

Process NFS4 ACLs

```
[root@scspr1845243002 TEST]# /xcp/linux/xcp verify -acl4 -noid 172.21.88.54:/source_vol
172.21.88.70:/dest_vol
XCP 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

 8,830 scanned, 1,414 found, 106 compared, 106 same data, 4 nonacls, 2,732 getacls, 2,702
v3perms, 15 same acls, 11.7 MiB in (2.31 MiB/s), 442 KiB out (87.5 KiB/s), 5s
16,739 scanned, 4,266 found, 1,891 compared, 1,891 same data, 8 nonacls, 8,318 getacls, 8,288
v3perms, 15 same acls, 119 MiB in (21.4 MiB/s), 1.64 MiB out (247 KiB/s), 10s
23,212 scanned, 7,682 found, 4,427 compared, 4,427 same data, 10 nonacls, 15,033 getacls, 15,002
v3perms, 15 same acls, 259 MiB in (26.6 MiB/s), 3.14 MiB out (291 KiB/s), 15s
29,352 scanned, 11,579 found, 7,596 compared, 7,596 same data, 11 nonacls, 22,530 getacls,
22,498 v3perms, 15 same acls, 443 MiB in (35.1 MiB/s), 4.91 MiB out (346 KiB/s), 20s
33,546 scanned, 15,461 found, 10,841 compared, 10,841 same data, 11 nonacls, 30,380 getacls,
30,350 v3perms, 15 same acls, 624 MiB in (35.0 MiB/s), 6.73 MiB out (360 KiB/s), 25s
38,254 scanned, 19,030 found, 13,804 compared, 13,804 same data, 11 nonacls, 37,355 getacls,
37,324 v3perms, 15 same acls, 813 MiB in (34.5 MiB/s), 8.43 MiB out (318 KiB/s), 31s
43,613 scanned, 22,420 found, 16,789 compared, 16,789 same data, 12 nonacls, 44,374 getacls,
44,340 v3perms, 15 same acls, 1.05 GiB in (51.2 MiB/s), 10.2 MiB out (368 KiB/s), 36s
45,216 scanned, 26,369 found, 20,594 compared, 20,594 same data, 16 nonacls, 52,284 getacls,
52,254 v3perms, 15 same acls, 1.21 GiB in (33.9 MiB/s), 12.1 MiB out (372 KiB/s), 41s
51,068 scanned, 30,263 found, 24,299 compared, 24,299 same data, 17 nonacls, 59,895 getacls,
59,864 v3perms, 15 same acls, 1.31 GiB in (20.0 MiB/s), 13.7 MiB out (341 KiB/s), 46s
55,290 scanned, 34,099 found, 28,049 compared, 28,049 same data, 18 nonacls, 67,699 getacls,
67,668 v3perms, 15 same acls, 1.44 GiB in (25.6 MiB/s), 15.5 MiB out (354 KiB/s), 51s
59,748 scanned, 37,981 found, 31,516 compared, 31,516 same data, 18 nonacls, 75,395 getacls,
75,362 v3perms, 15 same acls, 1.57 GiB in (27.1 MiB/s), 17.2 MiB out (339 KiB/s), 56s
62,001 scanned, 42,788 found, 36,035 compared, 36,035 same data, 19 nonacls, 84,953 getacls,
84,922 v3perms, 15 same acls, 1.71 GiB in (26.7 MiB/s), 19.3 MiB out (414 KiB/s), 1m1s
65,748 scanned, 47,120 found, 40,002 compared, 40,002 same data, 21 nonacls, 93,842 getacls,
93,812 v3perms, 15 same acls, 1.82 GiB in (23.4 MiB/s), 21.2 MiB out (390 KiB/s), 1m6s
75,674 scanned, 51,609 found, 44,123 compared, 44,123 same data, 21 nonacls, 102,489 getacls,
102,456 v3perms, 15 same acls, 1.94 GiB in (23.7 MiB/s), 23.1 MiB out (387 KiB/s), 1m11s
77,134 scanned, 55,916 found, 48,316 compared, 48,316 same data, 23 nonacls, 111,329 getacls,
111,298 v3perms, 15 same acls, 2.05 GiB in (23.6 MiB/s), 25.0 MiB out (395 KiB/s), 1m16s
80,124 scanned, 60,037 found, 52,239 compared, 52,239 same data, 24 nonacls, 119,719 getacls,
119,688 v3perms, 15 same acls, 2.21 GiB in (31.3 MiB/s), 27.0 MiB out (399 KiB/s), 1m21s
84,923 scanned, 64,882 found, 56,435 compared, 56,435 same data, 24 nonacls, 129,096 getacls,
129,064 v3perms, 15 same acls, 2.30 GiB in (17.1 MiB/s), 29.0 MiB out (399 KiB/s), 1m27s
86,344 scanned, 69,102 found, 60,681 compared, 60,681 same data, 24 nonacls, 137,647 getacls,
137,616 v3perms, 15 same acls, 2.41 GiB in (23.8 MiB/s), 31.0 MiB out (396 KiB/s), 1m32s
94,597 scanned, 73,905 found, 64,914 compared, 64,914 same data, 24 nonacls, 147,033 getacls,
147,002 v3perms, 15 same acls, 2.51 GiB in (18.6 MiB/s), 33.0 MiB out (387 KiB/s), 1m37s
99,828 scanned, 78,138 found, 68,815 compared, 68,815 same data, 27 nonacls, 155,641 getacls,
155,610 v3perms, 15 same acls, 2.62 GiB in (22.0 MiB/s), 34.9 MiB out (380 KiB/s), 1m42s
103,677 scanned, 82,375 found, 72,680 compared, 72,680 same data, 29 nonacls, 164,183 getacls,
164,152 v3perms, 15 same acls, 2.75 GiB in (27.4 MiB/s), 36.8 MiB out (396 KiB/s), 1m47s
107,130 scanned, 86,815 found, 76,762 compared, 76,762 same data, 29 nonacls, 173,284 getacls,
173,254 v3perms, 15 same acls, 2.85 GiB in (19.1 MiB/s), 38.8 MiB out (401 KiB/s), 1m52s
108,881 scanned, 91,357 found, 81,077 compared, 81,077 same data, 31 nonacls, 182,173 getacls,
182,142 v3perms, 15 same acls, 2.98 GiB in (27.0 MiB/s), 40.8 MiB out (403 KiB/s), 1m57s
113,527 scanned, 95,467 found, 84,590 compared, 84,590 same data, 35 nonacls, 190,257 getacls,
190,226 v3perms, 15 same acls, 3.12 GiB in (27.0 MiB/s), 42.6 MiB out (345 KiB/s), 2m2s
118,765 scanned, 99,513 found, 88,126 compared, 88,126 same data, 37 nonacls, 198,592 getacls,
198,560 v3perms, 15 same acls, 3.30 GiB in (36.7 MiB/s), 44.5 MiB out (389 KiB/s), 2m7s
120,201 scanned, 103,675 found, 92,139 compared, 92,139 same data, 37 nonacls, 206,827 getacls,
206,796 v3perms, 15 same acls, 3.46 GiB in (32.8 MiB/s)
, 46.3 MiB out (380 KiB/s), 2m12s
123,084 scanned, 107,670 found, 95,725 compared, 95,725 same data, 37 nonacls, 214,883 getacls,
214,850 v3perms, 15 same acls, 3.60 GiB in (27.8 MiB/s)
, 48.2 MiB out (354 KiB/s), 2m18s
125,529 scanned, 111,027 found, 98,693 compared, 98,693 same data, 38 nonacls, 221,614 getacls,
221,584 v3perms, 15 same acls, 3.72 GiB in (24.0 MiB/s), 49.6 MiB out (295 KiB/s), 2m23s
128,272 scanned, 114,821 found, 101,850 compared, 101,850 same data, 38 nonacls, 228,791
getacls, 228,760 v3perms, 15 same acls, 3.85 GiB in (24.4 MiB/s), 51.2 MiB out (299 KiB/s), 2m28s
132,305 scanned, 118,335 found, 104,789 compared, 104,789 same data, 45 nonacls, 236,032
getacls, 235,998 v3perms, 15 same acls, 3.98 GiB in (25.5 MiB/s), 52.8 MiB out (314 KiB/s), 2m33s
```

```

134,633 scanned, 121,658 found, 107,971 compared, 107,971 same data, 67 nonacls, 242,884
getacls, 242,854 v3perms, 15 same acs, 4.18 GiB in (40.9 MiB/s), 54.5 MiB out (347 KiB/s), 2m38s
134,633 scanned, 124,392 found, 110,674 compared, 110,674 same data, 67 nonacls, 248,205
getacls, 248,174 v3perms, 15 same acs, 4.44 GiB in (52.5 MiB/s), 56.1 MiB out (319 KiB/s), 2m43s
134,633 scanned, 127,765 found, 114,009 compared, 114,009 same data, 133 nonacls, 254,849
getacls, 254,818 v3perms, 15 same acs, 4.56 GiB in (24.0 MiB/s), 57.6 MiB out (312 KiB/s), 2m48s
134,633 scanned, 130,699 found, 116,993 compared, 116,993 same data, 137 nonacls, 260,843
getacls, 260,812 v3perms, 15 same acs, 4.65 GiB in (18.7 MiB/s), 59.0 MiB out (276 KiB/s), 2m54s
134,633 scanned, 132,656 found, 119,022 compared, 119,022 same data, 137 nonacls, 264,886
getacls, 264,856 v3perms, 15 same acs, 4.84 GiB in (39.0 MiB/s), 60.2 MiB out (250 KiB/s), 2m59s
134,633 scanned, 134,363 found, 120,799 compared, 120,799 same data, 137 nonacls, 268,374
getacls, 268,344 v3perms, 15 same acs, 4.95 GiB in (21.8 MiB/s), 61.1 MiB out (188 KiB/s), 3m4s

Xcp command : xcp verify -acl4 -noid 172.21.88.54:/source_vol 172.21.88.70:/dest_vol
134,633 scanned, 0 matched, 100% found (121,150 have data), 100% verified (data, attrs, mods,
acsls), 0 different item, 0 error
Speed       : 4.95 GiB in (27.4 MiB/s), 61.2 MiB out (339 KiB/s)
Total Time  : 3m4s.
STATUS      : PASSED

```

5.11 delete

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

Syntax

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

Example

```

[root@scspr1845243002 dest_vol]# /xcp/linux/xcp delete 172.21.88.70:/dest_vol
XCP 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

WARNING: You have selected 172.21.88.70:/dest_vol for removing data. Data in this path /dest_vol
will be deleted.
Are you sure you want to delete (yes/no): yes
Recursively removing data in 172.21.88.70:/dest_vol ...
 31,996 scanned, 5,786 removes, 3 rmdirs, 8.27 MiB in (1.65 MiB/s), 1.52 MiB out (312 KiB/s), 5s
 40,324 scanned, 19,829 removes, 22 rmdirs, 12.2 MiB in (799 KiB/s), 3.89 MiB out (485 KiB/s),
10s
 54,281 scanned, 32,194 removes, 2,365 rmdirs, 17.0 MiB in (991 KiB/s), 6.15 MiB out (463 KiB/s),
15s
 75,869 scanned, 44,903 removes, 4,420 rmdirs, 23.4 MiB in (1.29 MiB/s), 8.60 MiB out (501
KiB/s), 20s
 85,400 scanned, 59,728 removes, 5,178 rmdirs, 27.8 MiB in (881 KiB/s), 11.1 MiB out (511 KiB/s),
25s
106,391 scanned, 76,229 removes, 6,298 rmdirs, 34.7 MiB in (1.39 MiB/s), 14.0 MiB out (590
KiB/s), 30s
122,107 scanned, 93,203 removes, 7,448 rmdirs, 40.9 MiB in (1.24 MiB/s), 16.9 MiB out (606
KiB/s), 35s
134,633 scanned, 109,815 removes, 9,011 rmdirs, 46.5 MiB in (1.12 MiB/s), 20.0 MiB out (622
KiB/s), 40s
134,633 scanned, 119,858 removes, 9,051 rmdirs, 47.9 MiB in (288 KiB/s), 21.4 MiB out (296
KiB/s), 45s
134,633 scanned, 119,858 removes, 9,051 rmdirs, 47.9 MiB in (0/s), 21.4 MiB out (0/s), 50s
134,633 scanned, 121,524 removes, 9,307 rmdirs, 48.2 MiB in (51.7 KiB/s), 21.7 MiB out (49.5
KiB/s), 55s

Xcp command : xcp delete 172.21.88.70:/dest_vol
134,633 scanned, 0 matched, 134,632 delete items, 0 error
Speed       : 48.7 MiB in (869 KiB/s), 22.2 MiB out (396 KiB/s)
Total Time  : 57s.
STATUS      : PASSED

```

6 XCP NFS Logging

XCP <version> supports log file rotation and log filtering based on severity level.

Log file rotation

The logging module creates a new log file when the existing log file size exceeds the 50 MB limit. When the xcp.log file reaches 50MB, the module copies the contents to xcp.log.1 and sends only new logs to the xcp.log file. When the xcp.log file reaches the 50MB limit again, the module copies the contents to xcp.log.1 and the copies the contents of xcp.log.1 to xcp.log.2 and so on for 10 log rotations (until xcp.log.10). On the next log rotation, the module deletes the contents of xcp.log.10 and copies the contents xcp.log.9 to xcp.log.10.

The xcp.log file always contains recent logs. To trace the logs generated by XCP, the command executed request searches in the xcp.log file first, then in the xcp.log.1 file and so on.

Log message filtering

XCP log messages support five severity levels in order of decreasing severity:

CRITICAL, ERROR, WARNING, INFO, DEBUG.

You can filter XCP Log messages by using the XCP CLI command option "--loglevel" to specify the severity level at which logging begins.

This option filters out XCP log messages so that messages with a severity level lower than that specified in the option are not logged in the log file.

Example:

```
xcp scan --loglevel debug \\10.234.123.227\test share mb
```

Log message format

All log messages are logged in the following format in the log file:

```
%(asctime)s - %(levelname)s - %(process)d %(message)
```

Example:

```
2020-03-18 03:35:22,781 - INFO - 4455 xcp main pid 4455 runid 3112812948410038
2020-03-18 03:35:22,853 - DEBUG - 4455 xcp mount 'IP: XX.XX.XX.XX:/source_vol/agnos' Connected to
IP: XX.XX.XX.XX port 2049
2020-03-18 03:35:22,807 - WARNING - 4455 xcp IP: XX.XX.XX.XX tcp 2049 nfs3 c0 Receive buffer is
less than or equal to 256K
2020-03-18 03:35:22,844 - INFO - 4455 xcp xcp opened catalog
```

6.1 Comparing XCP NFS Logging in XCP1.5 and XCP 1.6

Table 7) Comparing XCP NFS Logging in XCP1.5 and XCP 1.6.

| No | Item | XCP 1.5 | XCP1.6 |
|----|-------------------|--|--|
| 1. | XCP log file | All log messages are logged in a single file named "xcp.log". | All new log messages are logged in the file named "xcp.log". When the "xcp.log" file reaches 50 MB, the contents are copied to "xcp.log.1". XCP 1.6x supports 10 additional log files rotated up to "xcp.log.10". |
| 2. | Log file location | xcp.log is created under the directory path: /opt/NetApp/xFiles/xcp | All log files are created under directory path: /opt/NetApp/xFiles/xcp/xcplogs The logs files are named "xcp.log", "xcp.log1", and so on up to "xcp.log.10" |

| No | Item | XCP 1.5 | XCP1.6 | | | | | | | | | | | | | | |
|---------|--|---|---|------|-------------------------|------|----------------------------------|------|---|--------|---|--------|---|--------|---------------------------------------|---|---|
| 3. | Log message format | <p>"%(progName)s%(pid)s %(time.strftime)s %(self.name)s% (level)s: %(msg)s\n"</p> <p>Example xcp 2019-09-03 05:14:30 xcp: opened catalog</p> | <p>"%(asctime)s - %(levelname)s - %(process)d %(message)s"</p> <p>Example 2020-03-18 03:35:22,844 - INFO - 4455 xcp xcp opened catalog</p> | | | | | | | | | | | | | | |
| 4. | --loglevel command line option | Does not support option to filter log messages. | <p>Supports option to filter XCP Log messages using the XCP CLI command option "--loglevel" to specify the severity level at which logging begins.</p> <p>Log message severity levels: [CRITICAL, ERROR, WARNING, INFO, DEBUG]</p> <p>Default severity level: "INFO"</p> <p>Note: The use of this option is recommended for "INFO" or DEBUG level messages only.</p> | | | | | | | | | | | | | | |
| 5 | <div>Summary text for XCP commands:</div> <table><tr><th>Command</th><th>counters</th></tr><tr><td>Scan</td><td>Scanned, Matched, Error</td></tr><tr><td>Copy</td><td>Scanned, Copied, Matched, Errors</td></tr><tr><td>Sync</td><td>Scanned, Copied, Modifications, New Items, Delete Items, Errors</td></tr><tr><td>Resume</td><td>Scanned, Copied, Modifications, New Items, Delete Items, Errors</td></tr><tr><td>Verify</td><td>Scanned, Matched, Found, Same data, Different Items, Errors</td></tr><tr><td>Delete</td><td>Scanned, Matched, Delete Item, Errors</td></tr></table> | Command | counters | Scan | Scanned, Matched, Error | Copy | Scanned, Copied, Matched, Errors | Sync | Scanned, Copied, Modifications, New Items, Delete Items, Errors | Resume | Scanned, Copied, Modifications, New Items, Delete Items, Errors | Verify | Scanned, Matched, Found, Same data, Different Items, Errors | Delete | Scanned, Matched, Delete Item, Errors | <p>Summary text displays in the following format:</p> <p><list of applicable counters> <space> <throughput> <execution time></p> <p>Example 9 scanned, 3.61 KiB in (3.70 KiB/s), 740 out (759/s), 0s.</p> | <p>Summary text displays in the following format:</p> <p>Line 1: <list of applicable counters></p> <p>Line 2: Speed: <throughput></p> <p>Line 3: Total Time: <execution time></p> <p>Line 4: STATUS: <passed/failed></p> <p>Example 13 scanned, 0 matched, 0 error Speed : 3.73 KiB in (4.89 KiB/s), 756 out (989/s) Total Time : 0s. STATUS : PASSED</p> |
| Command | counters | | | | | | | | | | | | | | | | |
| Scan | Scanned, Matched, Error | | | | | | | | | | | | | | | | |
| Copy | Scanned, Copied, Matched, Errors | | | | | | | | | | | | | | | | |
| Sync | Scanned, Copied, Modifications, New Items, Delete Items, Errors | | | | | | | | | | | | | | | | |
| Resume | Scanned, Copied, Modifications, New Items, Delete Items, Errors | | | | | | | | | | | | | | | | |
| Verify | Scanned, Matched, Found, Same data, Different Items, Errors | | | | | | | | | | | | | | | | |
| Delete | Scanned, Matched, Delete Item, Errors | | | | | | | | | | | | | | | | |

6.2 JSON Configuration for Logging

The following is an example logging configuration section in the xcpLogConfig.json JSON config file.

| |
|---|
| JSON config having "logConfig" option highlighted. |
| <pre>{ "level": "INFO", "maxBytes": "52428800", "name": "xcp.log" }</pre> |

With this configuration you can filter messages according to their severity by selecting a valid level value from CRITICAL, ERROR, WARNING, INFO, and Debug.

The maxBytes setting lets you change the file size of the rotating log files. Here the default is 50MB. Setting the value to 0 will stop rotation and a single file will be created for all logs.

The name option configures the name of the log file.

If any key value pair is missing, the system uses the default value. Any mistake with the name of a key is treat as new key and that key will not affect how the systems works or system functionality.

7 Event logging for XCP NFS

XCP supports event messaging which you can enable using the eventlog option in the xcpLogConfig.json JSON config file. All events messages are written to the file xcp_event.log located in the default location /opt/NetApp/xFiles/xcp/ or a custom location configured using the XCP_LOG_DIR or XCP_CONFIG_DIR environment variable. When both locations are set, XCP_LOG_DIR will take precedence.

To configure event messaging:

- 1. Create the xcpLogConfig.json JSON config file. For details, see the Create the JSON Configuration File section.
- 2. Set the eventlog option as required. For details, see the Description of options of config file section.

The following is an example of JSON configuration to enable event messaging:

| | |
|--|--|
| Enabling 'eventlog' option using config file | Example config file with other options enabled with event log |
| <pre>{ "eventlog": { "isEnabled": true, "level": "INFO" }, "sanitize": false }</pre> | <pre>{ "logConfig": { "level": "INFO", "maxBytes": 52428800, "name": "xcp.log" }, "eventlog": { "isEnabled": true, "level": "INFO" }, "syslog": { "isEnabled": true, "level": "info", "serverIp": "10.234.219.87",</pre> |

| | |
|--|---|
| | <pre> "port": 514 }, "sanitize": false } </pre> |
|--|---|

| eventlog sub options | | | Description of eventlog sub options |
|----------------------|----------------|---------------|--|
| Sub option | JSON data type | Default Value | |
| "isEnabled" | Boolean | false | This boolean option is used to enable event messaging. Setting it <code>false</code> will not generate any event messages and no event logs will be published to event log file. |
| "level" | String | "INFO" | Event message severity filter level. Event messaging support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, and DEBUG |

For NFS event logs refer to the Event logs for NFS.

7.1 Template for event log message

| |
|--|
| <pre> <Time stamp> - <Severity level> {"Event ID": <ID>, "Event Category":<category of xcp event log>, "Event Type": <type of event log>, "ExecutionId": < unique ID for each xcp command execution >, "Event Source": <host name>, "Description": <XCP event log message>} </pre> |
| <p>Example:</p> <pre> 2020-07-14 07:07:07,286 - ERROR {"Event ID": 51, "Event Category": "Application failure", "Event Type": "No space left on destination error", " ExecutionId ": 408252316712, "Event Source": "NETAPP-01", "Description": "Target volume is left with no free space while executing : copy {}. Please increase the size of target volume 10.234.104.250:/cat_vol"} </pre> |

| Options in an event log message | Description |
|---------------------------------|---|
| Event ID | The unique identifier for each event log message. |
| Event Category | Explains the category of event type and event log message. |
| Event Type | This is a short string that describes the event message. Multiple event types can belong to one category. |
| Description | The description field contains the event log message generated by XCP. |
| ExecutionId | A unique identifier for each XCP command executed. |

8 XCP syslog client for NFS

XCP supports a syslog client to send XCP event log messages to a remote syslog receiver. It supports the UDP protocol using the default port 514.

8.1 Configure syslog client for NFS

Enabling the syslog client requires configuring the `.syslog` option in the `xcpLogConfig.json` JSON configuration file.

JSON configuration for configuring syslog client

The following example configuration for the syslog client:

| JSON config for syslog | |
|---|--|
| <pre>{ "syslog":{ "isEnabled":true, "level":"INFO", "serverIp":"10.234.219.d", "port":514 }, "sanitize":false }</pre> | |

Description of options for syslog in JSON config

The following options are case sensitive.

| Sub options name for “syslog” config | JSON Data Type | Default | Description |
|--------------------------------------|----------------|---------|--|
| isEnabled | Boolean | false | This Boolean option is used to enable the syslog client in XCP. Setting it to false will ignore the syslog configuration. |
| level | String | “INFO” | This option sets the message severity filter level. XCP event log messages support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, DEBUG |
| serverIp | string | None | Remote syslog server IP addresses or hostname. |
| port | Integer | 514 | Remote syslog receiver port. Syslog receivers accepting syslog datagrams on a different port can be configured with this port option. UDP port 514 is the default. |

Option “sanitize”: This is a common option not to be specified within “syslog” configuration. This option has a global scope and is common to logging, event log, and syslog within JSON

config. Setting this value to “true” will enable hiding sensitive information in syslog messages posted to the syslog server.

8.2 Format of syslog messages

Every syslog messages sent to the remote syslog server over UDP is formatted as per the RFC 5424 format.

The severity level as per RFC 5424 supported for syslog messages for XCP:

| Severity values | Severity level |
|-----------------|---------------------------------------|
| 3 | Error: error conditions |
| 4 | Warning: warning conditions |
| 6 | Informational: informational messages |
| 7 | Debug: debug-level messages |

In the syslog header, version has a value of 1 and the facility value for all messages for XCP is set to 1 (user-level messages).

`<PRI> = syslog facility * 8 + severity value`

XCP application syslog message format with syslog header:

| |
|---|
| Template: <code><PRI><version> <Time stamp> <hostname> xcp_nfs - - - <XCP message></code> |
| Example syslog message: <code><14>1 2020-07-08T06:30:34.341Z netapp xcp_nfs - - - INFO {"Event ID": 14, "Event Category": "XCP job status", "Event Type": "XCP scan completion", "Event Source": "netapp", "Description": "XCP scan is completed by scanning 8 items"}</code> |

XCP application message without syslog header:

| |
|--|
| Template: <code><message severity level i.e CRITICAL, ERROR, WARNING, INFO, DEBUG> <XCP event log message></code> |
| Example message: <code>INFO {"Event ID": 14, "Event Category": "XCP job status", "Event Type": "XCP scan completion", "Event Source": "netapp", "Description": "XCP scan is completed by scanning 8 items"}</code> |

9 XCP NFS Use Cases

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

9.1 How to Transition 7-Mode NFSv3 Storage to ONTAP

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

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

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

| ✓ | Step | Description |
|---|------|--|
| | 1. | <p>Verify that the target ONTAP system is healthy.</p> <pre> CLUSTER::> cluster show Node Health Eligibility ----- CLUSTER-01 true true CLUSTER-02 true true 2 entries were displayed. CLUSTER::> node show Node Health Eligibility Uptime Model Owner Location ----- CLUSTER-01 true true 78 days 21:01 FAS8060 CLUSTER-02 true true 78 days 20:50 FAS8060 2 entries were displayed. CLUSTER::> storage failover show Node Partner Takeover Node Partner Possible State Description ----- CLUSTER-01 CLUSTER-02 true Connected to CLUSTER-02 CLUSTER-02 CLUSTER-01 true Connected to CLUSTER-01 2 entries were displayed. </pre> |
| | 2. | <p>Verify that at least one non-root aggregate exists on the target system. The aggregate is normal.</p> <pre> CLUSTER::> storage aggregate show Aggregate Size Available Used% State #Vols Nodes RAID Status ----- aggr0 368.4GB 17.85GB 95% online 1 CLUSTER-01 raid_dp, normal aggr0_CLUSTER_02_0 368.4GB 17.85GB 95% online 1 CLUSTER-02 raid_dp, normal source 1.23TB 1.10TB 11% online 6 CLUSTER-01 raid_dp, normal 3 entries were displayed. </pre> <p>Note: If there is no data aggregate, create a new one using the <code>storage aggr create</code> command.</p> |
| | 3. | <p>Create an SVM on the target cluster system.</p> <pre> CLUSTER::> vservers create -vservers dest -rootvolume dest_root -aggregate poc - rootvolume-security-style mixed [Job 647] Job succeeded: Vserver creation completed Verify the security style and language settings of the source </pre> <p>Verify the SVM was created</p> <pre> CLUSTER::> vservers show -vservers dest Vserver: dest Vserver Type: data Vserver Subtype: default Vserver UUID: 91f6d786-0063-11e5-b114-00a09853a969 Root Volume: dest_root Aggregate: poc NIS Domain: - Root Volume Security Style: mixed LDAP Client: - Default Volume Language Code: C.UTF-8 Snapshot Policy: default Comment: </pre> |

| ✓ | Step | Description |
|---|------|---|
| | | <pre> Quota Policy: default List of Aggregates Assigned: - Limit on Maximum Number of Volumes allowed: unlimited Vserver Admin State: running Vserver Operational State: running Vserver Operational State Stopped Reason: - Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp Disallowed Protocols: - Is Vserver with Infinite Volume: false QoS Policy Group: - Config Lock: false IPspace Name: Default </pre> |
| | 4. | <p>Remove the <code>fcp</code>, <code>iscsi</code>, <code>ndmp</code>, and <code>cifs</code> protocols from the target SVM.</p> <pre>CLUSTER::> vserver remove-protocols -vserver dest -protocols fcp,iscsi,ndmp,cifs</pre> <p>Verify <code>nfs</code> is the allowed protocol for this SVM</p> <pre>CLUSTER::> vserver show -vserver dest -fields allowed-protocols vserver allowed-protocols ----- dest nfs</pre> |
| | 5. | <p>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</p> <pre>CLUSTER::> vol create -vserver dest -volume dest_nfs -aggregate poc -size 150g - type RW -state online -security-style mixed [Job 648] Job succeeded: Successful</pre> |
| | 6. | <p>Create a data LIF to serve NFS client requests.</p> <pre>CLUSTER::> network interface create -vserver dest -lif dest_lif -address 10.61.73.115 -netmask 255.255.255.0 -role data -data-protocol nfs -home-node CLUSTER-01 -home-port e01</pre> <p>Verify the LIF is successfully created.</p> <pre>CLUSTER::> network interface show -vserver dest Logical Status Network Current Current Is Vserver Interface Admin/Oper Address/Mask Node Port Home ----- dest dest_lif up/up 10.61.73.113/24 CLUSTER-01 e0i true</pre> |
| | 7. | <p>Create a static route with the SVM if required</p> <pre>CLUSTER::> network route create -vserver dest -destination 0.0.0.0/0 -gateway 192.168.100.111</pre> <p>Verify the route is created</p> <pre>CLUSTER::> network route show -vserver source Vserver Destination Gateway Metric ----- dest 0.0.0.0/0 10.61.73.1 20</pre> |
| | 8. | <p>Mount the target NFS data volume in the SVM namespace.</p> <pre>CLUSTER::> volume mount -vserver dest -volume dest_nfs -junction-path /dest_nfs - active true</pre> <p>Verify the volume is successfully mounted</p> <pre>CLUSTER::> volume show -vserver dest -fields junction-path vserver volume junction-path -----</pre> |

| ✓ | Step | Description |
|---|------|--|
| | | <pre>dest dest_nfs /dest_nfs dest dest_root / 2 entries were displayed.</pre> <p>Note: You can also specify volume mount options (junction path) with the <code>.volume create</code> command.</p> |
| | 9. | <p>Start the NFS service on the target SVM.</p> <pre>CLUSTER::> vserver nfs start -vserver dest</pre> <p>Verify the service is started and running</p> <pre>CLUSTER::> vserver nfs status The NFS server is running on Vserver "dest". CLUSTER::> nfs show Vserver: dest General Access: true v3: enabled v4.0: disabled 4.1: disabled UDP: enabled TCP: enabled Default Windows User: - Default Windows Group: -</pre> |
| | 10. | <p>Check that the default NFS export policy is applied to the target SVM.</p> <pre>CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default</pre> |
| | 11. | <p>If required, create a new custom export policy for the target SVM.</p> <pre>CLUSTER::> vserver export-policy create -vserver dest -policyname xcpexportpolicy</pre> <p>Verify the new custom export-policy is created</p> <pre>CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default dest xcpexportpolicy 2 entries were displayed.</pre> |
| | 12. | <p>Modify the export policy rules to allow access to NFS client(s).</p> <pre>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</pre> <p>Verify the policy rules have modified</p> <pre>CLUSTER::> export-policy rule show -instance Vserver: dest Policy Name: xcpexportpolicy Rule Index: 1 Access Protocol: nfs3 Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0 RO Access Rule: none RW Access Rule: none User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: none Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true</pre> |

| ✓ | Step | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----------------|---|--------|--------|-------|--------|-------|------------|------|-------|--------|---|-----------------|--|--|--|--|--|--|--|--|--|-----------|--------|--|--|--|---|------|-----------|-----------------|--|--|--|--|--|--|--|--|--|----------|--------|--|--|--|---|------------|
| | 13. | <p>Verify that the client is allowed access to the volume.</p> <pre>CLUSTER::> export-policy check-access -vserver dest -volume dest_nfs -client-ip 10.61.82.215 -authentication-method none -protocol nfs3 -access-type read-write</pre> <table><thead><tr><th>Path</th><th>Policy</th><th>Owner</th><th>Policy</th><th>Owner</th><th>Type</th><th>Rule</th><th>Index</th><th>Access</th></tr></thead><tbody><tr><td>/</td><td>xcpexportpolicy</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>dest_root</td><td>volume</td><td></td><td></td><td></td><td>1</td><td>read</td></tr><tr><td>/dest_nfs</td><td>xcpexportpolicy</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>dest_nfs</td><td>volume</td><td></td><td></td><td></td><td>1</td><td>read-write</td></tr></tbody></table> <p>2 entries were displayed.</p> | Path | Policy | Owner | Policy | Owner | Type | Rule | Index | Access | / | xcpexportpolicy | | | | | | | | | | dest_root | volume | | | | 1 | read | /dest_nfs | xcpexportpolicy | | | | | | | | | | dest_nfs | volume | | | | 1 | read-write |
| Path | Policy | Owner | Policy | Owner | Type | Rule | Index | Access | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| / | xcpexportpolicy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | dest_root | volume | | | | 1 | read | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| /dest_nfs | xcpexportpolicy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | dest_nfs | volume | | | | 1 | read-write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14. | <p>Connect to the Linux NFS server. Create a mount point for the NFS exported volume.</p> <pre>[root@localhost /]# cd /mnt [root@localhost mnt]# mkdir dest</pre> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15. | <p>Mount the target NFSv3 exported volume at this mount point.</p> <p>Note: The NFSv3 volumes should be exported but not necessarily be mounted by the NFS server. The XCP Linux host client mounts these volumes if they can be mounted.</p> <pre>[root@localhost mnt]# mount -t nfs 10.61.73.115:/dest_nfs /mnt/dest</pre> <p>Verify the mount point is successfully created.</p> <pre>[root@localhost /]# mount grep nfs 10.61.73.115:/dest_nfs on /mnt/dest type nfs (rw,relatime,vers=3,rsz=65536,wsz=65536,namlen=255,hard,proto=tcp,timeo=600,ret rans=2,sec=sys,mountaddr=10.61.82.215,mountvers=3,mountport=4046,mountproto=udp,loc al_lock=none,addr=10.61.73.115)</pre> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16. | <p>Create a test file on the NFS exported mount point to enable read-write access.</p> <pre>[root@localhost dest]# touch test.txt</pre> <p>Verify the file is created</p> <pre>[root@localhost dest]# ls -l total 0 -rw-r--r-- 1 root bin 0 Jun 2 03:16 test.txt</pre> <p>Note: Once the read-write test is complete, delete the file from the target NFS mount point.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 17. | <p>Connect to the Linux client system in which XCP is installed. Browse to the XCP install path.</p> <pre>[root@localhost ~]# cd /linux/ [root@localhost linux]#</pre> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 18. | <p>Query the source 7-Mode NFSv3 exports by running the <code>xcp show</code> command on the XCP Linux client host system.</p> <pre>[root@localhost]# ./xcp show 10.61.82.215</pre> <pre>== NFS Exports == Mounts Errors Server 4 0 10.61.82.215 Space Files Space Files Free Free Used Used Export 23.7 GiB 778,134 356 KiB 96 10.61.82.215:/vol/nfsvol1 17.5 GiB 622,463 1.46 GiB 117 10.61.82.215:/vol/nfsvol 328 GiB 10.8M 2.86 GiB 7,904 10.61.82.215:/vol/vol0/home 328 GiB 10.8M 2.86 GiB 7,904 10.61.82.215:/vol/vol0 == Attributes of NFS Exports == drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol1 drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol drwxrwxrwx --t root wheel 4KiB 4KiB 9d22h 10.61.82.215:/vol/vol0/home drwxr-xr-x --- root wheel 4KiB 4KiB 4d0h 10.61.82.215:/vol/vol0</pre> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ✓ | Step | Description |
|---|------|--|
| | | 3.89 KiB in (5.70 KiB/s), 7.96 KiB out (11.7 KiB/s), 0s. |
| | 19. | <p>Scan the source NFSv3 exported paths and print the statistics of their file structure.</p> <p>Note: NetApp recommends putting the source NFSv3 exports in read-only mode during <code>xcp</code>, <code>scan</code>, <code>copy</code>, and <code>sync</code> operations.</p> <pre>[root@localhost /]# ./xcp scan 10.61.82.215:/vol/nfsvol</pre> <pre>nfsvol nfsvol/n5000-uk9.5.2.1.N1.1.bin nfsvol/821_q_image.tgz nfsvol/822RC2_q_image.tgz nfsvol/NX5010_12_node_RCF_v1.3.txt nfsvol/n5000-uk9-kickstart.5.2.1.N1.1.bin nfsvol/NetApp_CN1610_1.1.0.5.stk nfsvol/glibc-common-2.7-2.x86_64.rpm nfsvol/glibc-2.7-2.x86_64.rpm nfsvol/rhel-server-5.6-x86_64-dvd.iso.filepart nfsvol/xcp nfsvol/xcp_source nfsvol/catalog</pre> <p>23 scanned, 7.79 KiB in (5.52 KiB/s), 1.51 KiB out (1.07 KiB/s), 1s.</p> |
| | 20. | <p>Copy source 7-Mode NFSv3 exports to NFSv3 exports on the target ONTAP system.</p> <pre>[root@localhost /]# ./xcp copy 10.61.82.215:/vol/nfsvol 10.61.73.115:/dest_nfs</pre> <pre>44 scanned, 39 copied, 264 MiB in (51.9 MiB/s), 262 MiB out (51.5 MiB/s), 5s 44 scanned, 39 copied, 481 MiB in (43.3 MiB/s), 479 MiB out (43.4 MiB/s), 10s 44 scanned, 40 copied, 748 MiB in (51.2 MiB/s), 747 MiB out (51.3 MiB/s), 16s 44 scanned, 40 copied, 1.00 GiB in (55.9 MiB/s), 1.00 GiB out (55.9 MiB/s), 21s 44 scanned, 40 copied, 1.21 GiB in (42.8 MiB/s), 1.21 GiB out (42.8 MiB/s), 26s Sending statistics... 44 scanned, 43 copied, 1.46 GiB in (47.6 MiB/s), 1.45 GiB out (47.6 MiB/s), 31s.</pre> |
| | 21. | <p>After copy is finished, verify that source and destination NFSv3 exports have identical data. Run the <code>xcp verify</code> command.</p> <pre>[root@localhost /]# ./xcp verify 10.61.82.215:/vol/nfsvol 10.61.73.115:/dest_nfs</pre> <pre>44 scanned, 44 found, 28 compared, 27 same data, 2.41 GiB in (98.4 MiB/s), 6.25 MiB out (255 KiB/s), 26s 44 scanned, 44 found, 30 compared, 29 same data, 2.88 GiB in (96.4 MiB/s), 7.46 MiB out (249 KiB/s), 31s 44 scanned, 100% found (43 have data), 43 compared, 100% verified (data, attrs, mods), 2.90 GiB in (92.6 MiB/s), 7.53 MiB out (240 KiB/s), 32s.</pre> <p>Note: If <code>verify</code> finds differences between source and destination data, then the error <code>no such file or directory</code> is reported in the summary. To fix that issue, run the <code>xcp sync</code> command to copy the source changes to the destination.</p> |
| | 22. | <p>Before and during the cutover, run <code>verify</code> again. If the source has new or updated data, then perform incremental updates. Run the <code>xcp sync</code> command.</p> <p>Note: For this operation, the previous copy index name or number is required.</p> <pre>[root@localhost /]# ./xcp sync -id 3</pre> <pre>Index: {source: '10.61.82.215:/vol/nfsvol', target: '10.61.73.115:/dest_nfs1'}</pre> <pre>64 reviewed, 64 checked at source, 6 changes, 6 modifications, 51.7 KiB in (62.5 KiB/s), 22.7 KiB out (27.5 KiB/s), 0s. xcp: sync '3': Starting search pass for 1 modified directory... xcp: sync '3': Found 6 indexed files in the 1 changed directory xcp: sync '3': Rereading the 1 modified directory to find what's new... xcp: sync '3': Deep scanning the 1 directory that changed...</pre> |

| ✓ | Step | Description |
|---|------|---|
| | | <p>Note: 11 scanned, 11 copied, 12.6 KiB in (6.19 KiB/s), 9.50 KiB out (4.66 KiB/s), 2s.</p> |
| | 23. | <p>To resume a previously interrupted copy operation, run the <code>xcp resume</code> command.</p> <pre>[root@localhost /]# ./xcp resume -id 4 Index: {source: '10.61.82.215:/vol/nfsvol', target: '10.61.73.115:/dest_nfs7'} xcp: resume '4': WARNING: Incomplete index. xcp: resume '4': Found 18 completed directories and 1 in progress 106 reviewed, 24.2 KiB in (30.3 KiB/s), 7.23 KiB out (9.06 KiB/s), 0s. xcp: resume '4': Starting second pass for the in-progress directory... xcp: resume '4': Found 3 indexed directories and 0 indexed files in the 1 in- progress directory xcp: resume '4': In progress dirs: unindexed 1, indexed 0 xcp: resume '4': Resuming the 1 in-progress directory... 20 scanned, 7 copied, 205 MiB in (39.6 MiB/s), 205 MiB out (39.6 MiB/s), 5s 20 scanned, 14 copied, 425 MiB in (42.1 MiB/s), 423 MiB out (41.8 MiB/s), 11s 20 scanned, 14 copied, 540 MiB in (23.0 MiB/s), 538 MiB out (23.0 MiB/s), 16s 20 scanned, 14 copied, 721 MiB in (35.6 MiB/s), 720 MiB out (35.6 MiB/s), 21s 20 scanned, 15 copied, 835 MiB in (22.7 MiB/s), 833 MiB out (22.7 MiB/s), 26s 20 scanned, 16 copied, 1007 MiB in (34.3 MiB/s), 1005 MiB out (34.3 MiB/s), 31s 20 scanned, 17 copied, 1.15 GiB in (33.9 MiB/s), 1.15 GiB out (33.9 MiB/s), 36s 20 scanned, 17 copied, 1.27 GiB in (25.5 MiB/s), 1.27 GiB out (25.5 MiB/s), 41s 20 scanned, 17 copied, 1.45 GiB in (36.1 MiB/s), 1.45 GiB out (36.1 MiB/s), 46s 20 scanned, 17 copied, 1.69 GiB in (48.7 MiB/s), 1.69 GiB out (48.7 MiB/s), 51s Sending statistics... 20 scanned, 20 copied, 21 indexed, 1.77 GiB in (33.5 MiB/s), 1.77 GiB out (33.4 MiB/s), 54s.</pre> <p>After resume finishes copying files, run <code>verify</code> again so that the source and destination storage have identical data.</p> |
| | 24 | <p>The NFSv3 client host needs to unmount the source NFSv3 exports provisioned from the 7-Mode storage and mounts the target NFSv3 exports from clustered Data ONTAP. Cutover requires an outage.</p> |

9.2 How to Transition 7-Mode volume Snapshot Copies to ONTAP

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

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

Warning:

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

Task Table 3) Transitioning a Source 7-Mode Volume Snapshot Copy to ONTAP..

| ✓ | Step | Description |
|---|------|---|
| | 1. | <p>Verify that the target ONTAP system is healthy.</p> <pre>CLUSTER::> cluster show Node Health Eligibility ----- CLUSTER-01 true true CLUSTER-02 true true 2 entries were displayed. CLUSTER::> node show</pre> |

| ✓ | Step | Description |
|---|------|--|
| | | <pre> Node Health Eligibility Uptime Model Owner Location ----- CLUSTER-01 true true 78 days 21:01 FAS8060 RTP CLUSTER-02 true true 78 days 20:50 FAS8060 RTP 2 entries were displayed. CLUSTER::> storage failover show Node Partner Possible State Description ----- CLUSTER-01 CLUSTER-02 true Connected to CLUSTER-02 CLUSTER-02 CLUSTER-01 true Connected to CLUSTER-01 2 entries were displayed. </pre> |
| | 2. | <p>Verify that at least one non-root aggregate exists on the target system. The aggregate is normal.</p> <pre> CLUSTER::> storage aggregate show Aggregate Size Available Used% State #Vols Nodes RAID Status ----- aggr0 368.4GB 17.85GB 95% online 1 CLUSTER-01 raid_dp, normal aggr0_CLUSTER_02_0 368.4GB 17.85GB 95% online 1 CLUSTER-02 raid_dp, normal source 1.23TB 1.10TB 11% online 6 CLUSTER-01 raid_dp, normal 3 entries were displayed. </pre> <p>Note: If there is no data aggregate, create a new one using the <code>.storage aggr create</code> command.</p> |
| | 3. | <p>Create an SVM on the target cluster system.</p> <pre> CLUSTER::> vserver create -vserver dest -rootvolume dest_root -aggregate poc - rootvolume-security-style mixed [Job 647] Job succeeded: Vserver creation completed Verify the security style and language settings of the source </pre> <p>Verify the SVM was created</p> <pre> CLUSTER::> vserver show -vserver dest Vserver: dest Vserver Type: data Vserver Subtype: default Vserver UUID: 91f6d786-0063-11e5-b114-00a09853a969 Root Volume: dest_root Aggregate: poc NIS Domain: - Root Volume Security Style: mixed LDAP Client: - Default Volume Language Code: C.UTF-8 Snapshot Policy: default Comment: Quota Policy: default List of Aggregates Assigned: - Limit on Maximum Number of Volumes allowed: unlimited Vserver Admin State: running Vserver Operational State: running Vserver Operational State Stopped Reason: - Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp Disallowed Protocols: - Is Vserver with Infinite Volume: false QoS Policy Group: - Config Lock: false </pre> |

| ✓ | Step | Description | | | | | | | | | | | | | | |
|---------|-------------------|--|----------------------|-------------------|-------------------|----------------------|--------------|--------------|------------|------|----------|-------|-----------------|------------|-----|------|
| | | IPspace Name: Default | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | 4. | <p>Remove the <code>fc</code>, <code>iscsi</code>, <code>ndmp</code>, and <code>cifs</code> protocols from the target SVM.</p> <pre>CLUSTER::> vserver remove-protocols -vserver dest -protocols fcp,iscsi,ndmp,cifs</pre> <p>Verify NFS is the allowed protocol for this SVM</p> <pre>CLUSTER::> vserver show -vserver dest -fields allowed-protocols vserver allowed-protocols ----- dest nfs</pre> | | | | | | | | | | | | | | |
| | 5. | <p>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</p> <pre>CLUSTER::> vol create -vserver dest -volume dest_nfs -aggregate poc -size 150g - type RW -state online -security-style mixed [Job 648] Job succeeded: Successful</pre> | | | | | | | | | | | | | | |
| | 6. | <p>Create a data LIF to serve NFS client requests.</p> <pre>CLUSTER::> network interface create -vserver dest -lif dest_lif -address 10.61.73.115 -netmask 255.255.255.0 -role data -data-protocol nfs -home-node CLUSTER-01 -home-port e0i</pre> <p>Verify the LIF is successfully created.</p> <pre>CLUSTER::> network interface show -vserver dest</pre> <table><thead><tr><th>Vserver</th><th>Logical Interface</th><th>Status Admin/Oper</th><th>Network Address/Mask</th><th>Current Node</th><th>Current Port</th><th>Is Home</th></tr></thead><tbody><tr><td>dest</td><td>dest_lif</td><td>up/up</td><td>10.61.73.113/24</td><td>CLUSTER-01</td><td>e0i</td><td>true</td></tr></tbody></table> | Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home | dest | dest_lif | up/up | 10.61.73.113/24 | CLUSTER-01 | e0i | true |
| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home | | | | | | | | | | |
| dest | dest_lif | up/up | 10.61.73.113/24 | CLUSTER-01 | e0i | true | | | | | | | | | | |
| | 7. | <p>Create a static route with the SVM if required</p> <pre>CLUSTER::> network route create -vserver dest -destination 0.0.0.0/0 -gateway 192.168.100.111</pre> <p>Verify the route is created</p> <pre>CLUSTER::> network route show -vserver source</pre> <table><thead><tr><th>Vserver</th><th>Destination</th><th>Gateway</th><th>Metric</th></tr></thead><tbody><tr><td>dest</td><td>0.0.0.0/0</td><td>10.61.73.1</td><td>20</td></tr></tbody></table> | Vserver | Destination | Gateway | Metric | dest | 0.0.0.0/0 | 10.61.73.1 | 20 | | | | | | |
| Vserver | Destination | Gateway | Metric | | | | | | | | | | | | | |
| dest | 0.0.0.0/0 | 10.61.73.1 | 20 | | | | | | | | | | | | | |
| | 8. | <p>Mount the target NFS data volume in the SVM namespace.</p> <pre>CLUSTER::> volume mount -vserver dest -volume dest_nfs -junction-path /dest_nfs - active true</pre> <p>Verify the volume is successfully mounted</p> <pre>CLUSTER::> volume show -vserver dest -fields junction-path vserver volume junction-path ----- dest dest_nfs /dest_nfs dest dest_root / 2 entries were displayed.</pre> <p>Note: You can also specify volume mount options (junction path) with the <code>volume create</code> command.</p> | | | | | | | | | | | | | | |

| ✓ | Step | Description |
|---|------|--|
| | 9. | <div>Start the NFS service on the target SVM.</div> <div>CLUSTER::> vserver nfs start -vserver dest</div> <div>Verify the service is started and running</div> <div>CLUSTER::> vserver nfs status The NFS server is running on Vserver "dest".</div> <div>CLUSTER::> nfs show</div> <div>Vserver: dest</div> <div>General Access: true v3: enabled v4.0: disabled 4.1: disabled UDP: enabled TCP: enabled</div> <div>Default Windows User: - Default Windows Group: -</div> |
| | 10. | <div>Check that the default NFS export policy is applied to the target SVM.</div> <div>CLUSTER::> vserver export-policy show -vserver dest</div> <div>Vserver Policy Name</div> <div>-----</div> <div>dest default</div> |
| | 11. | <div>If required, create a new custom export policy for the target SVM.</div> <div>CLUSTER::> vserver export-policy create -vserver dest -policyname xcpexportpolicy</div> <div>Verify the new custom export-policy is created</div> <div>CLUSTER::> vserver export-policy show -vserver dest</div> <div>Vserver Policy Name</div> <div>-----</div> <div>dest default</div> <div>dest xcpexportpolicy</div> <div>2 entries were displayed.</div> |
| | 12. | <div>Modify the export policy rules to allow access to NFS client(s) on the target system.</div> <div>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</div> <div>Verify the policy rules have modified</div> <div>CLUSTER::> export-policy rule show -instance</div> <div>Vserver: dest</div> <div>Policy Name: xcpexportpolicy</div> <div>Rule Index: 1</div> <div>Access Protocol: nfs3</div> <div>Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0</div> <div>RO Access Rule: none</div> <div>RW Access Rule: none</div> <div>User ID To Which Anonymous Users Are Mapped: 65534</div> <div>Superuser Security Types: none</div> <div>Honor SetUID Bits in SETATTR: true</div> <div>Allow Creation of Devices: true</div> |
| | 13. | <div>Verify that the client has access to the target volume.</div> <div>CLUSTER::> export-policy check-access -vserver dest -volume dest_nfs -client-ip 10.61.82.215 -authentication-method none -protocol nfs3 -access-type read-write</div> <div>Path Policy Owner Owner Type Index Access</div> <div>-----</div> <div>/ xcpexportpolicy dest_root volume 1 read</div> <div>/dest nfs xcpexportpolicy</div> |

| ✓ | Step | Description |
|---|------|--|
| | | <pre> dest_nfs volume 1 read-write 2 entries were displayed. </pre> |
| | 14. | <p>Connect to the Linux NFS server. Create a mount point for the NFS exported volume.</p> <pre> [root@localhost ~]# cd /mnt [root@localhost mnt]# mkdir dest </pre> |
| | 15. | <p>Mount the target NFSv3 exported volume at this mount point.</p> <p>Note: The NFSv3 volumes should be exported but not necessarily be mounted by the NFS server. The XCP Linux host client mounts these volumes if they can be mounted.</p> <pre> [root@localhost mnt]# mount -t nfs 10.61.73.115:/dest_nfs /mnt/dest </pre> <p>Verify the mount point is successfully created.</p> <pre> [root@localhost ~]# mount grep nfs 10.61.73.115:/dest_nfs on /mnt/dest type nfs </pre> |
| | 16. | <p>Create a test file on the NFS exported mount point to enable read-write access.</p> <pre> [root@localhost dest]# touch test.txt </pre> <p>Verify the file is created</p> <pre> [root@localhost dest]# ls -l total 0 -rw-r--r-- 1 root bin 0 Jun 2 03:16 test.txt </pre> <p>Note: Once the read-write test is complete, delete the file from the target NFS mount point.</p> |
| | 17. | <p>Connect to the Linux client system in which XCP is installed. Browse to the XCP install path.</p> <pre> [root@localhost ~]# cd /linux/ [root@localhost linux]# </pre> |
| | 18. | <p>Query the source 7-Mode NFSv3 exports by running the <code>xcp show</code> command on the XCP Linux client host system.</p> <pre> [root@localhost]# ./xcp show 10.61.82.215 == NFS Exports == Mounts Errors Server 4 0 10.61.82.215 Space Files Space Files Free Free Used Used Export 23.7 GiB 778,134 356 KiB 96 10.61.82.215:/vol/nfsvol1 17.5 GiB 622,463 1.46 GiB 117 10.61.82.215:/vol/nfsvol 328 GiB 10.8M 2.86 GiB 7,904 10.61.82.215:/vol/vol0/home 328 GiB 10.8M 2.86 GiB 7,904 10.61.82.215:/vol/vol0 == Attributes of NFS Exports == drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol1 drwxr-xr-x --- root wheel 4KiB 4KiB 2d21h 10.61.82.215:/vol/nfsvol drwxrwxrwx --t root wheel 4KiB 4KiB 9d22h 10.61.82.215:/vol/vol0/home drwxr-xr-x --- root wheel 4KiB 4KiB 4d0h 10.61.82.215:/vol/vol0 3.89 KiB in (5.70 KiB/s), 7.96 KiB out (11.7 KiB/s), 0s. </pre> |
| | 19. | <p>Scan the source NFSv3 exported paths and print the statistics of their file structure.</p> <p>Note: NetApp recommends putting the source NFSv3 exports in read-only mode during <code>xcp.scan</code>, <code>copy</code>, and <code>sync</code> operations. In <code>sync</code> operations it is mandatory to pass the <code>-snap</code> option with a corresponding value.</p> <pre> [root@localhost ~]# ./xcp scan 10.61.82.215:/vol/nfsvol/.snapshot/snap1 nfsvol </pre> |

| ✓ | Step | Description |
|---|------|---|
| | | <pre> nfsvol/n5000-uk9.5.2.1.N1.1.bin nfsvol/821_q_image.tgz nfsvol/822RC2_q_image.tgz nfsvol/NX5010_12_node_RCF_v1.3.txt nfsvol/n5000-uk9-kickstart.5.2.1.N1.1.bin nfsvol/catalog 23 scanned, 7.79 KiB in (5.52 KiB/s), 1.51 KiB out (1.07 KiB/s), 1s. [root@scspr1202780001 vol_acl4]# ./xcp sync -id 7msnap1 -snap 10.236.66.199:/vol/nfsvol/.snapshot/snap10 (show scan and sync) </pre> |
| | 20. | <p>Copy source 7-Mode NFSv3 snapshot (base) to NFSv3 exports on the target ONTAP system.</p> <pre> [root@localhost /]# ./xcp copy 10.61.82.215:/vol/nfsvol/.snapshot/snap1 10.61.73.115:/dest_nfs 44 scanned, 39 copied, 264 MiB in (51.9 MiB/s), 262 MiB out (51.5 MiB/s), 5s 44 scanned, 39 copied, 481 MiB in (43.3 MiB/s), 479 MiB out (43.4 MiB/s), 10s 44 scanned, 40 copied, 748 MiB in (51.2 MiB/s), 747 MiB out (51.3 MiB/s), 16s 44 scanned, 40 copied, 1.00 GiB in (55.9 MiB/s), 1.00 GiB out (55.9 MiB/s), 21s 44 scanned, 40 copied, 1.21 GiB in (42.8 MiB/s), 1.21 GiB out (42.8 MiB/s), 26s Sending statistics... 44 scanned, 43 copied, 1.46 GiB in (47.6 MiB/s), 1.45 GiB out (47.6 MiB/s), 31s. </pre> <p>Note: Keep this base snapshot for further sync operations.</p> |
| | 21. | <p>After copy is complete, verify that source and destination NFSv3 exports have identical data. Run the <code>xcp verify</code> command.</p> <pre> [root@localhost /]# ./xcp verify 10.61.82.215:/vol/nfsvol 10.61.73.115:/dest_nfs 44 scanned, 44 found, 28 compared, 27 same data, 2.41 GiB in (98.4 MiB/s), 6.25 MiB out (255 KiB/s), 26s 44 scanned, 44 found, 30 compared, 29 same data, 2.88 GiB in (96.4 MiB/s), 7.46 MiB out (249 KiB/s), 31s 44 scanned, 100% found (43 have data), 43 compared, 100% verified (data, attrs, mods), 2.90 GiB in (92.6 MiB/s), 7.53 MiB out (240 KiB/s), 32s. </pre> <p>Note: If <code>verify</code> finds differences between source and destination data, then the error <code>no such file or directory</code> is reported in the summary. To fix that issue, run the <code>xcp sync</code> command to copy the source changes to the destination.</p> |
| | 22. | <p>Before and during the cutover, run <code>verify</code> again. If the source has new or updated data, then perform incremental updates. If there are incremental changes, create a new Snapshot copy for these changes and pass that snapshot path with the “-snap” option for sync operations. Run the <code>xcp sync</code> command with “-snap” option and snapshot path.</p> <pre> [root@localhost /]# ./xcp sync -id 3 Index: {source: '10.61.82.215:/vol/nfsvol/.snapshot/snap1', target: '10.61.73.115:/dest_nfs1'} 64 reviewed, 64 checked at source, 6 changes, 6 modifications, 51.7 KiB in (62.5 KiB/s), 22.7 KiB out (27.5 KiB/s), 0s. xcp: sync '3': Starting search pass for 1 modified directory... xcp: sync '3': Found 6 indexed files in the 1 changed directory xcp: sync '3': Rereading the 1 modified directory to find what's new... xcp: sync '3': Deep scanning the 1 directory that changed... 11 scanned, 11 copied, 12.6 KiB in (6.19 KiB/s), 9.50 KiB out (4.66 KiB/s), 2s.. </pre> <p>Note: For this operation, the base snapshot is required.</p> |
| | 23. | <p>To resume a previously interrupted copy operation, run the <code>xcp resume</code> command.</p> <pre> [root@scspr1202780001 534h_dest_vol]# ./xcp resume -id 3 </pre> |

| ✓ | Step | Description |
|---|------|---|
| | | XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxxxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 xcp: Index: {source: '10.61.82.215:/vol/nfsvol',/.snapshot/snap1, target: 10.237.160.55:/dest_vol} xcp: resume '7msnap_res1': Reviewing the incomplete index... xcp: diff '7msnap_res1': Found 143 completed directories and 230 in progress 39,688 reviewed, 1.28 MiB in (1.84 MiB/s), 13.3 KiB out (19.1 KiB/s), 0s. xcp: resume '7msnap_res1': Starting second pass for the in-progress directories... xcp: resume '7msnap_res1': Resuming the in-progress directories... xcp: resume '7msnap_res1': Resumed command: copy {-newid: u'7msnap_res1'} xcp: resume '7msnap_res1': Current options: {-id: '7msnap_res1'} xcp: resume '7msnap_res1': Merged options: {-id: '7msnap_res1', -newid: u'7msnap_res1'} xcp: resume '7msnap_res1': Values marked with a * include operations before resume 68,848 scanned*, 54,651 copied*, 39,688 indexed*, 35.6 MiB in (7.04 MiB/s), 28.1 MiB out (5.57 MiB/s), 5s |
| | 24 | The NFSv3 client host needs to unmount the source NFSv3 exports provisioned from the 7-Mode storage and mounts the target NFSv3 exports from clustered Data ONTAP. Cutover requires an outage. |

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

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

Note: NetApp assumes that the source NFSv4 volume is exported and mounted on the client system and that XCP is already installed on a Linux system. The source should be a NetApp 7-Mode system that support ACLs. ACL migration is supported from NetApp to NetApp only. To copy files with a special character in the name, make sure the source and destination support UTF-8 encoded language.

Prerequisites for migrating a source NFSv4 export to ONTAP.

The destination system must have NFSv4 configured.

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

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

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

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

[root@localhost ~]# ./xcp scan -l -acl4 10.63.5.56:/vol1/
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2029

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

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

There are two options for working with subdirectories:

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

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


```
[root@localhost ~]# ./xcp scan -l -acl4 10.63.5.56:/vol1/DIR1/DIR11
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2029

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

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

```
[root@localhost ~]# ./xcp scan -l -acl4 10.63.5.56:/vol1:/DIR1/DIR11
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Sun Mar 31 00:00:00 2029

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

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

Task Table 4) Migrating ACLv4 from NetApp 7-Mode to a NetApp Storage System.

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

| ✓ | Step | Description | | | | | | | | | | | | | | |
|---------|-------------------|---|----------------------|-------------------|-------------------|----------------------|--------------|--------------|---------|------|----------|-------|-----------------|------------|-----|------|
| | | <div>[Job 647] Job succeeded: Vserver creation completed Verify the security style and language settings of the source</div> <div>Verify the SVM was created</div> <div>CLUSTER::> vserver show -vserver dest <div>Vserver: dest Vserver Type: data Vserver Subtype: default Vserver UUID: 91f6d786-0063-11e5-b114-00a09853a969 Root Volume: dest_root Aggregate: poc NIS Domain: - Root Volume Security Style: mixed LDAP Client: - Default Volume Language Code: C.UTF-8 Snapshot Policy: default Comment: Quota Policy: default List of Aggregates Assigned: - Limit on Maximum Number of Volumes allowed: unlimited Vserver Admin State: running Vserver Operational State: running Vserver Operational State Stopped Reason: - Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp Disallowed Protocols: - Is Vserver with Infinite Volume: false QoS Policy Group: - Config Lock: false IPspace Name: Default</div></div> | | | | | | | | | | | | | | |
| | 4. | <div>Remove the fcp, iscsi, ndmp, and cifs protocols from the target SVM.</div> <div>CLUSTER::> vserver remove-protocols -vserver dest -protocols fcp,iscsi,ndmp,cifs</div> <div>Verify nfs is the allowed protocol for this SVM</div> <div>CLUSTER::> vserver show -vserver dest -fields allowed-protocols vserver allowed-protocols ----- dest nfs</div> | | | | | | | | | | | | | | |
| | 5. | <div>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</div> <div>CLUSTER::> vol create -vserver dest -volume dest_nfs -aggregate poc -size 150g -type RW -state online -security-style mixed [Job 648] Job succeeded: Successful</div> | | | | | | | | | | | | | | |
| | 6. | <div>Create a data LIF to serve NFS client requests.</div> <div>CLUSTER::> network interface create -vserver dest -lif dest_lif -address 10.61.73.115 -netmask 255.255.255.0 -role data -data-protocol nfs -home-node CLUSTER-01 -home-port e0i</div> <div>Verify the LIF is successfully created.</div> <div>CLUSTER::> network interface show -vserver dest <table><tr><th>Vserver</th><th>Logical Interface</th><th>Status Admin/Oper</th><th>Network Address/Mask</th><th>Current Node</th><th>Current Port</th><th>Is Home</th></tr><tr><td>dest</td><td>dest_lif</td><td>up/up</td><td>10.61.73.113/24</td><td>CLUSTER-01</td><td>e0i</td><td>true</td></tr></table></div> | Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home | dest | dest_lif | up/up | 10.61.73.113/24 | CLUSTER-01 | e0i | true |
| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home | | | | | | | | | | |
| dest | dest_lif | up/up | 10.61.73.113/24 | CLUSTER-01 | e0i | true | | | | | | | | | | |
| | 7. | <div>Create a static route with the SVM if required</div> <div>CLUSTER::> network route create -vserver dest -destination 0.0.0.0/0 -gateway 192.168.100.111</div> | | | | | | | | | | | | | | |

| ✓ | Step | Description |
|---|------|--|
| | | |
| | | Verify the route is created |
| | | <pre> CLUSTER::> network route show -vserver source Vserver Destination Gateway Metric ----- dest 0.0.0.0/0 10.61.73.1 20 </pre> |
| | 8. | <p>Mount the target NFS data volume in the SVM namespace.</p> <pre> CLUSTER::> volume mount -vserver dest -volume dest_nfs -junction-path /dest_nfs -active true </pre> <p>Verify the volume is successfully mounted</p> <pre> CLUSTER::> volume show -vserver dest -fields junction-path vserver volume junction-path ----- dest dest_nfs /dest_nfs dest dest_root / 2 entries were displayed. </pre> <p>Note: You can also specify volume mount options (junction path) with the <code>volume create</code> command.</p> |
| | 9. | <p>Start the NFS service on the target SVM.</p> <pre> CLUSTER::> vserver nfs start -vserver dest </pre> <p>Verify the service is started and running</p> <pre> CLUSTER::> vserver nfs status The NFS server is running on Vserver "dest". CLUSTER::> nfs show Vserver: dest General Access: true v3: enabled v4.0: enabled 4.1: disabled UDP: enabled TCP: enabled Default Windows User: - Default Windows Group: - </pre> |
| | 10. | <p>Check that the default NFS export policy is applied to the target SVM.</p> <pre> CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default </pre> |
| | 11. | <p>If required, create a new custom export policy for the target SVM.</p> <pre> CLUSTER::> vserver export-policy create -vserver dest -policyname xcpexportpolicy </pre> <p>Verify the new custom export-policy is created</p> <pre> CLUSTER::> vserver export-policy show -vserver dest Vserver Policy Name ----- dest default dest xcpexportpolicy 2 entries were displayed. </pre> |

| ✓ | Step | Description | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----------------|---|--------|------------|------------|------------|------------|------------|--------|---|-----------------|-----------|--------|--|---|------|-----------|-----------------|----------|--------|--|---|------------|
| | 12. | <p>Modify the export policy rules to allow access to NFS client(s).</p> <pre>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</pre> <p>Verify the policy rules have modified</p> <pre>CLUSTER::> export-policy rule show -instance</pre> <pre> Vserver: dest Policy Name: xcpexportpolicy Rule Index: 1 Access Protocol: nfs3 Client Match Hostname, IP Address, Netgroup, or Domain: 0.0.0.0/0 RO Access Rule: none RW Access Rule: none User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: none Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true</pre> | | | | | | | | | | | | | | | | | | | | | |
| | 13. | <p>Verify that the client is allowed access to the volume.</p> <pre>CLUSTER::> export-policy check-access -vserver dest -volume dest_nfs -client-ip 10.61.82.215 -authentication-method none -protocol nfs3 -access-type read-write</pre> <table><thead><tr><th>Path</th><th>Policy</th><th>Owner</th><th>Policy</th><th>Owner Type</th><th>Rule Index</th><th>Access</th></tr></thead><tbody><tr><td>/</td><td>xcpexportpolicy</td><td>dest_root</td><td>volume</td><td></td><td>1</td><td>read</td></tr><tr><td>/dest_nfs</td><td>xcpexportpolicy</td><td>dest_nfs</td><td>volume</td><td></td><td>1</td><td>read-write</td></tr></tbody></table> <p>2 entries were displayed.</p> | Path | Policy | Owner | Policy | Owner Type | Rule Index | Access | / | xcpexportpolicy | dest_root | volume | | 1 | read | /dest_nfs | xcpexportpolicy | dest_nfs | volume | | 1 | read-write |
| Path | Policy | Owner | Policy | Owner Type | Rule Index | Access | | | | | | | | | | | | | | | | | |
| / | xcpexportpolicy | dest_root | volume | | 1 | read | | | | | | | | | | | | | | | | | |
| /dest_nfs | xcpexportpolicy | dest_nfs | volume | | 1 | read-write | | | | | | | | | | | | | | | | | |
| | 14. | <p>Connect to the Linux NFS server. Create a mount point for the NFS exported volume.</p> <pre>[root@localhost /]# cd /mnt [root@localhost mnt]# mkdir dest</pre> | | | | | | | | | | | | | | | | | | | | | |
| | 15. | <p>Mount the target NFSv4 exported volume at this mount point.</p> <p>Note: The NFSv4 volumes should be exported but not necessarily be mounted by the NFS server. The XCP Linux host client mounts these volumes if they can be mounted.</p> <pre>[root@localhost mnt]# mount -t nfs4 10.63.5.56:/vol1 /mnt/vol1</pre> <p>Verify the mount point is successfully created.</p> <pre>[root@localhost mnt]# mount grep nfs 10.63.5.56:/vol1 on /mnt/vol1 type nfs4 (rw,relatime,vers=4.0,rsize=65536,wsiz=65536,namlen=255,hard,proto=tcp,timeo=600, retrans=2,sec=sys,clientaddr=10.234.152.84,local_lock=none,addr=10.63.5.56)</pre> | | | | | | | | | | | | | | | | | | | | | |
| | 16. | <p>Create a test file on the NFS exported mount point to enable read-write access.</p> <pre>[root@localhost dest]# touch test.txt</pre> <p>Verify the file is created</p> <pre>[root@localhost dest]# ls -l total 0 -rw-r--r-- 1 root bin 0 Jun 2 03:16 test.txt</pre> <p>Note: Once the read-write test is complete, delete the file from the target NFS mount point.</p> | | | | | | | | | | | | | | | | | | | | | |
| | 17. | <p>Connect to the Linux client system in which XCP is installed. Browse to the XCP install path.</p> <pre>[root@localhost ~]# cd /linux/ [root@localhost linux]#</pre> | | | | | | | | | | | | | | | | | | | | | |

| ✓ | Step | Description |
|---|------|--|
| | 18. | <p>Query the source NFSv4 exports by running the <code>xcp show</code> command on the XCP Linux client host system.</p> <pre> root@localhost]# ./xcp show 10.63.5.56 XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 getting pmap dump from 10.63.5.56 port 111... getting export list from 10.63.5.56... sending 6 mounts and 24 nfs requests to 10.63.5.56... == RPC Services == '10.63.5.56': UDP rpc services: MNT v1/2/3, NFS v3, NLM v4, PMAP v2/3/4, STATUS v1 '10.63.5.56': TCP rpc services: MNT v1/2/3, NFS v3/4, NLM v4, PMAP v2/3/4, STATUS v1 == NFS Exports == Mounts Errors Server 6 0 10.63.5.56 Space Files Space Files Free Free Used Used Export 94.7 MiB 19,883 324 KiB 107 10.63.5.56:/ 971 MiB 31,023 2.19 MiB 99 10.63.5.56:/vol2 970 MiB 31,024 2.83 MiB 98 10.63.5.56:/vol1 9.33 GiB 310,697 172 MiB 590 10.63.5.56:/vol_005 43.3 GiB 1.10M 4.17 GiB 1.00M 10.63.5.56:/vol3 36.4 GiB 1.10M 11.1 GiB 1.00M 10.63.5.56:/vol4 == Attributes of NFS Exports == drwxr-xr-x --- root root 4KiB 4KiB 6d2h 10.63.5.56:/ drwxr-xr-x --- root root 4KiB 4KiB 3d2h 10.63.5.56:/vol2 drwxr-xr-x --- root root 4KiB 4KiB 3d2h 10.63.5.56:/vol1 drwxr-xr-x --- root root 4KiB 4KiB 9d2h 10.63.5.56:/vol_005 drwxr-xr-x --- root root 4KiB 4KiB 9d4h 10.63.5.56:/vol3 drwxr-xr-x --- root root 4KiB 4KiB 9d4h 10.63.5.56:/vol4 6.09 KiB in (9.19 KiB/s), 12.2 KiB out (18.3 KiB/s), 0s. </pre> |
| | 19. | <p>Scan the source NFSv4 exported paths and print the statistics of their file structure.</p> <p>Note: NetApp recommends putting the source NFSv4 exports in read-only mode during <code>xcp scan</code>, <code>copy</code>, and <code>sync</code> operations.</p> <pre> [root@localhost]# ./xcp scan -acl4 10.63.5.56:/vol1 XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 vol1 vol1/test/f1 vol1/test 3 scanned, 3 getacls, 3 v3perms, 1.59 KiB in (1.72 KiB/s), 696 out (753/s), 0s. </pre> |
| | 20. | <p>Copy source NFSv4 exports to NFSv4 exports on the target ONTAP system.</p> <pre> [root@localhost]# ./xcp copy -acl4 -newid id1 10.63.5.56:/vol1 10.63.5.56:/vol2 XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 3 scanned, 2 copied, 3 indexed, 3 getacls, 3 v3perms, 1 setacl, 14.7 KiB in (11.7 KiB/s), 61 KiB out (48.4 KiB/s), 1s.. </pre> |
| | 21. | <p>After copy is complete, verify that source and destination NFSv4 exports have identical data. Run the <code>xcp verify</code> command.</p> <pre> [root@localhost]# ./xcp verify -acl4 -noid 10.63.5.56:/vol1 10.63.5.56:/vol2 XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 3 scanned, 100% found (0 have data), 100% verified (data, attrs, mods, acls), 6 getacls, 6 v3perms, 2.90 KiB in (4.16 KiB/s), 2.94 KiB out (4.22 KiB/s), 0s. </pre> |

| ✓ | Step | Description |
|---|------|---|
| | | <p>Note: If <code>verify</code> finds differences between source and destination data, then the error <code>no such file or directory</code> is reported in the summary. To fix that issue, run the <code>xcp sync</code> command to copy the source changes to the destination.</p> |
| | 22. | <p>Before and during the cutover, run <code>verify</code> again. If the source has new or updated data, then perform incremental updates. Run the <code>xcp sync</code> command.</p> <pre>[root@ root@localhost]# ./xcp sync -id id1 XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 xcp: Index: {source: 10.63.5.56:/vol1, target: 10.63.5.56:/vol2} 3 reviewed, 3 checked at source, no changes, 3 reindexed, 25.6 KiB in (32.3 KiB/s), 23.3 KiB out (29.5 KiB/s), 0s.</pre> <p>Note: For this operation, the previous copy index name or number is required.</p> |
| | 23. | <p>To resume a previously interrupted copy operation, run the <code>xcp resume</code> command.</p> <pre>[root@localhost]# ./xcp resume -id id1 XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxx [NetApp Inc] until Mon Dec 31 00:00:00 2029 xcp: Index: {source: 10.63.5.56:/vol3, target: 10.63.5.56:/vol4} xcp: resume 'id1': Reviewing the incomplete index... xcp: diff 'id1': Found 0 completed directories and 8 in progress 39,899 reviewed, 1.64 MiB in (1.03 MiB/s), 14.6 KiB out (9.23 KiB/s), 1s. xcp: resume 'id1': Starting second pass for the in-progress directories... xcp: resume 'id1': Resuming the in-progress directories... xcp: resume 'id1': Resumed command: copy {-acl4: True} xcp: resume 'id1': Current options: {-id: 'id1'} xcp: resume 'id1': Merged options: {-acl4: True, -id: 'id1'} xcp: resume 'id1': Values marked with a * include operations before resume 86,404 scanned, 39,912 copied, 39,899 indexed, 13.0 MiB in (2.60 MiB/s), 78.4 KiB out (15.6 KiB/s), 5s 86,404 scanned, 39,912 copied, 39,899 indexed, 13.0 MiB in (0/s), 78.4 KiB out (0/s), 10s 1.00M scanned, 100% found (1M have data), 1M compared, 100% verified (data, attrs, mods, acls), 2.00M getacls, 202 v3perms, 1.00M same acls, 2.56 GiB in (2.76 MiB/s), 485 MiB out (524 KiB/s), 15m48s.</pre> <p>After <code>resume</code> finishes copying files, run <code>verify</code> again so that the source and destination storage have identical data.</p> |

10 XCP SMB

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

10.1 XCP SMB Storage

XCP SMB transitions and migrations have the following user login requirements:

- XCP host system: XCP host user must have administrator privilege (user must be part of "BUILTIN\Administrators" group on the XCP SMB host system).
- Add the migration or XCP host user to the "Manage audit & security log" policy in your Active Directory. To locate the 'Manage Auditing and Security Log' Policy on Windows 10:
 - Open the Group Policy Editor dialog box
 - Go to: Computer Configuration > Windows Settings > Security Settings > Local Policies > User Rights Assignment

- Click “Manage auditing and security log”
- To add an XCP host user select “Add User or Group”
For more information see: [Manage auditing and security log](#)
- Target storage system: XCP host 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”.

11 XCP SMB Installation

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

Note: There is no option to upgrade, please install to replace any existing version.

Task Table 5) Microsoft VC++ Redistributable Installation.

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

Task Table 6) XCP SMB Initial Setup Procedure.

| Step | Action |
|------|---|
| 1. | Copy the XCP SMB binary NETAPP_XCP_<version>.tgz on a Windows host. |
| 2. | Create an xcp directory on desktop. |
| 3. | Extract the archive and copy the xcp.exe from xcp\windows\ to below location: <C:\Users\administrator.domainname\Desktop\xcp> |
| 4. | Run the xcp activate command. An error message appears indicating that the license is not found and activated. [C:\xcp>xcp activate (c) 2020 NetApp, Inc. License file C:\NetApp\XCP\license not found. Register for a license at https://xcp.netapp.com |
| 5. | Copy the downloaded license file to the Windows host at C:\NetApp\XCP. |
| 6. | Verify that the license file was copied at C:\NetApp\XCP |
| 7. | Run the xcp activate command to activate the XCP SMB license on the host. C:\Users\Administrator\Desktop\xcp>xcp activate |

| Step | Action |
|------|--|
| | XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 XCP activated C:\Users\Administrator\Desktop\xcp> |
| 9. | Verify that the license error has disappeared and XCP SMB is licensed. C:\xcp>xcp activate XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 XCP already activated C:\xcp> |

12 XCP SMB Command Reference

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

Table 8) XCP SMB Command Reference.

| Feature | Description |
|-------------------------|--|
| Core Engine Innovations | <ul style="list-style-type: none"> • Supports Windows, CLI only • Extreme performance (~25x comparable tools) • Multiple layers of granularity (qtrees, subdirectories, criteria-based filtering) • Easy deployment (64-bit Windows host-based software) |
| "help" | Displays information about XCP commands and options. |
| "show" | Requests information from host about SMB shares. |
| "activate" | Activates XCP license on Windows host systems |
| "scan" | Reads all files and directories found on a SMB share. |
| "copy" | Recursively copies everything from source to destination. |
| "license" | Displays XCP license information. |
| "license update" | Retrieves the latest license from the XCP server |
| "sync" | Scans the source and target in parallel and updates the target with all the modifications from the source. |
| "verify" | Performs three levels of verification to make sure that the target is the same as the source. The command verifies statistics, structure, and full data bit by bit. |

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

```
C:\xcp>xcp --help > help-output.txt
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00
2029
C:\xcp>
```


12.1 help

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

Syntax

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

Example

```
C:\Users\Administrator\Desktop\xcp>xcp --help
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00
2029
usage: xcp [-h] [-version]
          {scan,show,listen,configure,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,listen,configure,copy,sync,verify,license,activate,help}
  scan                  Read all the files in a file tree
  show                  Request information from host about SMB shares
  listen                Run xcp service
  configure              Configure xcp.ini file
  copy                  Recursively copy everything from source to target
  sync                  Sync target with source
  verify                Verify that the target is the same as the source
  license                Show xcp license info
  activate               Activate a license on the current host
  help                  Show help for commands
```

Parameters

The following table describes the `help` parameters.

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

help details

Display details, usage, arguments, and optional arguments.

```
C:\Users\Administrator\Desktop\xcp>xcp help sync
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00
2029
usage: xcp sync [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-ctime]
[-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-ctime       restore last accessed date on source
  -noatime              do not check file access time
  -noctime              do not check file creation time
  -nomtime              do not check file modification time
  -noattrs              do not check attributes
  -noownership          do not check ownership
  -atimewindow <float>  acceptable access time difference in seconds
  -ctimewindow <float>  acceptable creation time difference in seconds
  -mtimewindow <float>  acceptable modification time difference in seconds
```

```
-acl                copy security information
-fallback-user FALLBACK_USER
                   a user on the target machine to receive the permissions of local
(nondomain)source machine users (eg. domain\administrator)
-fallback-group     FALLBACK_GROUP
                   a group on the target machine to receive the permissions of local
(non-domain) source machine groups (eg. domain\administrators)
-l                 increase output
-root              sync acl for root directory
C:\Users\Administrator\Desktop\xcp>
```

12.2 show

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

Syntax

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

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

```

Example

```
C:\Users\Administrator\Desktop\xcp>xcp show \\<10.61.87.235
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00
2029
Shares Errors Server
7 0 10.61.87.235
== SMB Shares ==
Space Space Current
Free Used Connections Share Path Folder Path
0 0 N/A \\<10.61.87.235\IPC$ N/A
533GiB 4.72GiB 0 \\<10.61.87.235\ETC$ C:\etc
533GiB 4.72GiB 0 \\<10.61.87.235\HOME C:\vol\vol0\home
533GiB 4.72GiB 0 \\<10.61.87.235\C$ C:\
972MiB 376KiB 0 \\<10.61.87.235\testsecure C:\vol\testsecure
12 XCP SMB v1.6 User Guide © 2020 NetApp, Inc. All rights reserved.
47.8GiB 167MiB 1 \\<10.61.87.235\volxcp C:\vol\volxcp
9.50GiB 512KiB 1 \\<10.61.87.235\j1 C:\vol\j1
== Attributes of SMB Shares ==
Share Types Remark
IPC$ PRINTQ,IPC,SPECIAL,DEVICE Remote IPC
ETC$ SPECIAL Remote Administration
HOME DISKTREE Default Share
C$ SPECIAL Remote Administration
testsecure DISKTREE for secure copy
volxcp DISKTREE for xcpSMB
j1 DISKTREE
== Permissions of SMB Shares ==
Share Entity Type
IPC$ Everyone Allow/Full Control
ETC$ Administrators Allow/Full Control
HOME Everyone Allow/Full Control
C$ Administrators Allow/Full Control
```

Parameters

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

12.3 License

The `license` command displays XCP license information.

Syntax

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

Example

```
C:\Users\Administrator\Desktop\xcp>xcp license
xcp license
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

Licensed to "XXX (xxxx), NetApp Inc, xxxxxxxxx@netapp.com" until Mon Dec 31 00:00:00 2029
License type: SANDBOX
License status: ACTIVE
Customer name: N/A
Project number: N/A
Offline Host: Yes
Send statistics: No
Host activation date: N/A
License management URL: https://xcp.netapp.com
```

12.4 activate

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

Syntax

```
C:\Users\Administrator\Desktop\xcp>xcp activate
(c) 2020 NetApp, Inc.
License file C:\NetApp\XCP\license not found.
Register for a license at https://xcp.netapp.com
Register for license and run xcp activate command to activate the License.
```

Example

```
C:\Users\Administrator\Desktop\xcp>xcp activate
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
XCP activated
C:\Users\Administrator\Desktop\xcp>
```

12.5 scan

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

Syntax

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

Example

```
C:\Users\Administrator\Desktop\xcp>xcp scan \\10.61.87.235\volxcp
c:\netapp\xcp\xcp scan \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
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
c:\netapp\xcp\xcp scan \\10.237.163.71\source_share
60,345 scanned, 0 matched, 0 errors
Total Time : 8s
STATUS : PASSED
C:\Users\Administrator\Desktop\xcp>Parameters
```

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

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

scan --help

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

```
C:\xcp>xcp scan --help
xcp scan --help
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

usage: xcp scan [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-atime]
               [-depth <n>] [--loglevel <n>] [-newlog] [-stats] [-l]
               [-ownership] [-du] [-fmt <expression>]
               source

positional arguments:
  source

optional arguments:
  -h, --help            show this help message and exit
  -v                    increase debug verbosity
  -parallel <n>         number of concurrent processes (default: <cpu-count>)
  -match <filter>       only process files and directories that match the filter
                        (see `xcp help -match` for details)
  -preserve-atime       restore last accessed date on source
  -depth <n>            limit the search depth
  --loglevel <n>        option to set log level
  -newlog               option to get multiple log files
  -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:\netapp\xcp>xcp scan -v \\10.237.163.82\copy_share2
xcp scan -v \\10.237.163.82\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
---Truncated output---
copy_share2\ASUP.pm
```

```

copy_share2\ASUP_REST.pm
copy_share2\Allflavors_v2.pm
copy_share2\Armadillo.pm
copy_share2\AsupExtractor.pm
copy_share2\BTS_Config.pm
copy_share2\Backup.pm
copy_share2\Aggregate.pm
copy_share2\Burt.pm
copy_share2\CConfig.pm
copy_share2\CIFS.pm
copy_share2\CR.pm
copy_share2\CRC.pm
copy_share2\CSHM.pm
copy_share2\CSM.pm
copy_share2\agnostic\SFXOD.pm
copy_share2\agnostic\Snapmirror.pm
copy_share2\agnostic\VolEfficiency.pm
copy_share2\agnostic\flatfile.txt
copy_share2\agnostic
copy_share2

xcp scan \\10.237.163.82\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED

```

scan -parallel <n>

Set a higher or lower number of XCP concurrent processes.

Note: The maximum value for n is 61.

```

c:\netapp\xcp>xcp scan -parallel 8 \\10.237.163.73\copy_share2
xcp scan -parallel 8 \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

copy_share2\ASUP.pm
copy_share2\ASUP_REST.pm
copy_share2\Allflavors_v2.pm
copy_share2\Armadillo.pm
copy_share2\AsupExtractor.pm
copy_share2\BTS_Config.pm
copy_share2\Backup.pm
copy_share2\Aggregate.pm
copy_share2\agnostic\CifsAccess.pm
copy_share2\agnostic\DU_Cmode.pm
copy_share2\agnostic\Flexclone.pm
copy_share2\agnostic\HyA_Clone_Utils.pm
copy_share2\agnostic\Fileclone.pm
copy_share2\agnostic\Jobs.pm
copy_share2\agnostic\License.pm
copy_share2\agnostic\Panamax_Clone_Utils.pm
copy_share2\agnostic\LunCmds.pm
copy_share2\agnostic\ProtocolAccess.pm
copy_share2\agnostic\Qtree.pm
copy_share2\agnostic\Quota.pm
copy_share2\agnostic\RbacCmdFetcher.pm
copy_share2\agnostic\RbacCmdFetcher_ReadMe
copy_share2\agnostic\SFXOD.pm
copy_share2\agnostic\Snapmirror.pm
copy_share2\agnostic\VolEfficiency.pm
copy_share2\agnostic\flatfile.txt
copy_share2\agnostic
copy_share2

xcp scan -parallel 8 \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED

```

scan -match

Only process files and directories that match the filter.

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

```
c:\netapp\xcp>xcp scan -match "1*month < modified < 1*year" -fmt "{:>15} {:>7} {} {}'
{}'}.format(iso(mtime), humanize_size(size), type, relpath)" \\10.237.163.73\copy_share2
xcp scan -match "1*month < modified < 1*year" -fmt "{:>15} {:>7} {} {}'}.format(iso(mtime),
humanize_size(size), type, relpath)" \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp scan -match 1*month < modified < 1*year -fmt '{:>15} {:>7} {} {}'}.format(iso(mtime),
humanize_size(size), type, relpath) \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

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

```
c:\netapp\xcp>xcp scan -match "modified > 3*month and size > 4194304" -fmt "{}, {}, {}'
{}'}.format(iso(mtime), humanize_size(size), relpath)" \\10.237.163.82\copy_share2
xcp scan -match "modified > 3*month and size > 4194304" -fmt "{}, {}, {}'}.format(iso(mtime),
humanize_size(size), relpath)" \\10.237.163.82\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp scan -match modified > 3*month and size > 4194304 -fmt '{}, {}, {}'}.format(iso(mtime),
humanize_size(size), relpath) \\10.237.163.82\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

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

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

```
c:\netapp\xcp>xcp scan -match "type is directory" -fmt "{'}, {'}.join(map(str, [iso(mtime), relpath,
depth]))" \\10.237.163.73\copy_share2
xcp scan -match "type is directory" -fmt "{'}, {'}.join(map(str, [iso(mtime), relpath, depth]))"
\\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

2013-03-07_15:41:40.376072,copy_share2\agnostic,1
2020-03-05_04:15:07.769268,copy_share2,0

xcp scan -match type is directory -fmt "{'}, {'}.join(map(str, [iso(mtime), relpath, depth]))"
\\10.237.163.73\copy_share2
317 scanned, 2 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

```
c:\netapp\xcp>xcp scan -match "type is directory" -fmt "{'}, {'}.join(map(str, [iso(mtime), relpath,
depth]))" \\10.237.163.73\copy_share2 > name.csv
xcp scan -match "type is directory" -fmt "{'}, {'}.join(map(str, [iso(mtime), relpath, depth]))"
\\10.237.163.73\copy_share2 > name.csv
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

c:\netapp\xcp>
```

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

```
c:\netapp\xcp>xcp scan -match "type is not directory" -fmt "{ } {:>70}'}.format(abspath, mtime)"
\\10.237.163.73\copy_share2
xcp scan -match "type is not directory" -fmt "{ } {:>70}'}.format(abspath, mtime)"
\\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
```

```
--truncated output--
\\10.237.163.73\copy_share2\ASUP.pm
1362688899.238098
\\10.237.163.73\copy_share2\ASUP_REST.pm
1362688899.264073
\\10.237.163.73\copy_share2\Allflavors_v2.pm
1362688899.394938
\\10.237.163.73\copy_share2\Armadillo.pm
1362688899.402936
\\10.237.163.73\copy_share2\AsupExtractor.pm
1362688899.410922
\\10.237.163.73\copy_share2\BTS_Config.pm
1362688899.443902
\\10.237.163.73\copy_share2\Backup.pm
1362688899.444905
\\10.237.163.73\copy_share2\Aggregate.pm
1362688899.322019
\\10.237.163.73\copy_share2\Burt.pm
1362688899.446889
\\10.237.163.73\copy_share2\CCConfig.pm
1362688899.4479
\\10.237.163.73\copy_share2\CIFS.pm
1362688899.562795
\\10.237.163.73\copy_share2\agnostic\ProtocolAccess.pm
1362688900.358093
\\10.237.163.73\copy_share2\agnostic\Qtree.pm
1362688900.359095
\\10.237.163.73\copy_share2\agnostic\Quota.pm
1362688900.360094
\\10.237.163.73\copy_share2\agnostic\RbacCmdFetcher.pm
1362688900.3611
\\10.237.163.73\copy_share2\agnostic\RbacCmdFetcher_ReadMe
1362688900.362094
\\10.237.163.73\copy_share2\agnostic\SFXOD.pm
1362688900.363094
\\10.237.163.73\copy_share2\agnostic\Snapmirror.pm
1362688900.364092
\\10.237.163.73\copy_share2\agnostic\VolEfficiency.pm
1362688900.375077
\\10.237.163.73\copy_share2\agnostic\flatfile.txt
1362688900.376076

xcp scan -match type is not directory -fmt '{ } {:>70}'.format(abspath, mtime)
\\10.237.163.73\copy_share2
317 scanned, 315 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

scan -preserve-ctime

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`. XCP just reads the file, which triggers an update on `ctime`.

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

```
c:\netapp\xcp>xcp scan -preserve-ctime \\10.237.163.73\copy_share2
xcp scan -preserve-ctime \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

copy_share2\ASUP.pm
copy_share2\ASUP_REST.pm
copy_share2\Allflavors_v2.pm
copy_share2\Armadillo.pm
copy_share2\AsupExtractor.pm
copy_share2\BTS_Config.pm
copy_share2\Backup.pm
copy_share2\Aggregate.pm
copy_share2\Burt.pm
copy_share2\CCConfig.pm
copy_share2\agnostic\ProtocolAccess.pm
copy_share2\agnostic\Qtree.pm
```

```

copy_share2\agnostic\Quota.pm
copy_share2\agnostic\RbacCmdFetcher.pm
copy_share2\agnostic\RbacCmdFetcher_ReadMe
copy_share2\agnostic\SFXOD.pm
copy_share2\agnostic\Snapmirror.pm
copy_share2\agnostic\VolEfficiency.pm
copy_share2\agnostic\flatfile.txt
copy_share2\agnostic
copy_share2

xcp scan -preserve-atime \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 1s
STATUS : PASSED

```

scan -depth <n>

Limit the search depth of directories inside an SMB share.

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

```

c:\netapp\xcp>xcp scan -depth 2 \\10.237.163.73\copy_share2
xcp scan -depth 2 \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

copy_share2\ASUP.pm
copy_share2\ASUP_REST.pm
copy_share2\Allflavors_v2.pm
copy_share2\Armadillo.pm
copy_share2\AsupExtractor.pm
copy_share2\BTS_Config.pm
copy_share2\Backup.pm
copy_share2\Aggregate.pm
copy_share2\Burt.pm
copy_share2\CConfig.pm
copy_share2\CIFS.pm
copy_share2\CR.pm
copy_share2\CRC.pm
copy_share2\CSHM.pm
copy_share2\agnostic\Fileclone.pm
copy_share2\agnostic\Jobs.pm
copy_share2\agnostic\License.pm
copy_share2\agnostic\Panamax_Clone_Utils.pm
copy_share2\agnostic\LunCmds.pm
copy_share2\agnostic\ProtocolAccess.pm
copy_share2\agnostic\Qtree.pm
copy_share2\agnostic\Quota.pm
copy_share2\agnostic\RbacCmdFetcher.pm
copy_share2\agnostic\RbacCmdFetcher_ReadMe
copy_share2\agnostic\SFXOD.pm
copy_share2\agnostic\Snapmirror.pm
copy_share2\agnostic\VolEfficiency.pm
copy_share2\agnostic\flatfile.txt
copy_share2\agnostic
copy_share2

xcp scan -depth 2 \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED

```

scan -stats

Tree statistics report formats.

```

c:\netapp\xcp>xcp scan -stats \\10.237.163.73\copy_share2
xcp scan -stats \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

== Maximum Values ==
      Size      Depth    Namelen    Dirsize
    3.31MiB         2         29         297

== Average Values ==
      Size      Depth    Namelen    Dirsize
    64.3KiB         1         12         158

```



```

== Top File Extensions ==
      .pm .testcases no extension      .thpl      .php      .txt
      307      2      2      2      1      1

== Number of files ==
empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-100MiB      >100MiB
      81      170      62      2

== Space used ==
empty      <8KiB      8-64KiB 64KiB-1MiB      1-10MiB 10-100MiB      >100MiB
      0      357KiB      4.59MiB      9.62MiB      5.23MiB      0      0

== Directory entries ==
empty      1-10      10-100      100-1K      1K-10K      >10K
      1      1

== Depth ==
0-5      6-10      11-15      16-20      21-100      >100
317

== Modified ==
>1 year      >1 month 1-31 days      1-24 hrs      <1 hour      <15 mins      future      invalid
315      2

== Created ==
>1 year      >1 month 1-31 days      1-24 hrs      <1 hour      <15 mins      future      invalid
20      297

Total count: 317
Directories: 2
Regular files: 315
Symbolic links:
Junctions:
Special files:
Total space for regular files: 19.8MiB
Total space for directories: 0
Total space used: 19.8MiB
xcp scan -stats \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED

```

scan -l

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

```

c:\netapp\xcp>xcp scan -l \\10.237.163.73\copy_share2
xcp scan -l \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

f   195KiB      7y0d copy_share2\ASUP.pm
f   34.7KiB      7y0d copy_share2\ASUP_REST.pm
f    4.11KiB      7y0d copy_share2\Allflavors_v2.pm
f   38.1KiB      7y0d copy_share2\Armadillo.pm
f   3.83KiB      7y0d copy_share2\AsupExtractor.pm
f   70.1KiB      7y0d copy_share2\BTS_Config.pm
f    2.65KiB      7y0d copy_share2\Backup.pm
f   60.3KiB      7y0d copy_share2\Aggregate.pm
f   36.9KiB      7y0d copy_share2\Burt.pm
f    8.98KiB      7y0d copy_share2\CConfig.pm
f   19.3KiB      7y0d copy_share2\CIFS.pm
f   20.7KiB      7y0d copy_share2\CR.pm
f    2.28KiB      7y0d copy_share2\CRC.pm
f   18.7KiB      7y0d copy_share2\CSHM.pm
f   43.0KiB      7y0d copy_share2\CSM.pm
f   19.7KiB      7y0d copy_share2\ChangeModel.pm
f   33.3KiB      7y0d copy_share2\Checker.pm
f    3.47KiB      7y0d copy_share2\Class.pm
f   37.8KiB      7y0d copy_share2\Client.pm
f   188KiB      7y0d copy_share2\agnostic\Flexclone.pm
f   15.9KiB      7y0d copy_share2\agnostic\HyA_Clone_Utils.pm
f   13.4KiB      7y0d copy_share2\agnostic\Fileclone.pm
f   41.8KiB      7y0d copy_share2\agnostic\Jobs.pm
f   24.0KiB      7y0d copy_share2\agnostic\License.pm
f   34.8KiB      7y0d copy_share2\agnostic\Panamax_Clone_Utils.pm

```

```
f 30.2KiB 7y0d copy_share2\agnostic\LunCmds.pm
f 40.9KiB 7y0d copy_share2\agnostic\ProtocolAccess.pm
f 15.7KiB 7y0d copy_share2\agnostic\Qtree.pm
f 29.3KiB 7y0d copy_share2\agnostic\Quota.pm
f 13.7KiB 7y0d copy_share2\agnostic\RbacCmdFetcher.pm
f 5.55KiB 7y0d copy_share2\agnostic\RbacCmdFetcher_ReadMe
f 3.92KiB 7y0d copy_share2\agnostic\SFXOD.pm
f 35.8KiB 7y0d copy_share2\agnostic\Snapmirror.pm
f 40.4KiB 7y0d copy_share2\agnostic\VolEfficiency.pm
f 6.22KiB 7y0d copy_share2\agnostic\flatfile.txt
d 0 7y0d copy_share2\agnostic
d 0 19h17m copy_share2

xcp scan -l \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

scan -ownership

Retrieves ownership information for files.

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

```
c:\netapp\xcp>xcp scan -l -ownership \\10.237.163.73\copy_share2
xcp scan -l -ownership \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

f BUILTIN\Administrators 195KiB 7y0d copy_share2\ASUP.pm
f BUILTIN\Administrators 34.7KiB 7y0d copy_share2\ASUP_REST.pm
f BUILTIN\Administrators 4.11KiB 7y0d copy_share2\Allflavors_v2.pm
f BUILTIN\Administrators 38.1KiB 7y0d copy_share2\Armadillo.pm
f BUILTIN\Administrators 3.83KiB 7y0d copy_share2\AsupExtractor.pm
f BUILTIN\Administrators 70.1KiB 7y0d copy_share2\BTS_Config.pm
f BUILTIN\Administrators 2.65KiB 7y0d copy_share2\Backup.pm
f BUILTIN\Administrators 60.3KiB 7y0d copy_share2\Aggregate.pm
f BUILTIN\Administrators 36.9KiB 7y0d copy_share2\Burt.pm
f BUILTIN\Administrators 8.98KiB 7y0d copy_share2\CConfig.pm
f BUILTIN\Administrators 19.3KiB 7y0d copy_share2\CIFS.pm
f BUILTIN\Administrators 20.7KiB 7y0d copy_share2\CR.pm
f BUILTIN\Administrators 2.28KiB 7y0d copy_share2\CRC.pm
f BUILTIN\Administrators 18.7KiB 7y0d copy_share2\CSHM.pm
f BUILTIN\Administrators 43.0KiB 7y0d copy_share2\CSM.pm
f BUILTIN\Administrators 19.7KiB 7y0d copy_share2\ChangeModel.pm
f BUILTIN\Administrators 33.3KiB 7y0d copy_share2\Checker.pm
f BUILTIN\Administrators 3.47KiB 7y0d copy_share2\Class.pm
f BUILTIN\Administrators 37.8KiB 7y0d copy_share2\Client.pm
f BUILTIN\Administrators 2.44KiB 7y0d copy_share2\ClientInfo.pm
f BUILTIN\Administrators 37.2KiB 7y0d copy_share2\ClientMgr.pm
f BUILTIN\Administrators 17.1KiB 7y0d copy_share2\ClientRPC.pm
f BUILTIN\Administrators 9.21KiB 7y0d copy_share2\ClusterAgent.pm
f BUILTIN\Administrators 15.7KiB 7y0d copy_share2\agnostic\Qtree.pm
f BUILTIN\Administrators 29.3KiB 7y0d copy_share2\agnostic\Quota.pm
f BUILTIN\Administrators 13.7KiB 7y0d copy_share2\agnostic\RbacCmdFetcher.pm
f BUILTIN\Administrators 5.55KiB 7y0d copy_share2\agnostic\RbacCmdFetcher_ReadMe
f BUILTIN\Administrators 3.92KiB 7y0d copy_share2\agnostic\SFXOD.pm
f BUILTIN\Administrators 35.8KiB 7y0d copy_share2\agnostic\Snapmirror.pm
f BUILTIN\Administrators 40.4KiB 7y0d copy_share2\agnostic\VolEfficiency.pm
f BUILTIN\Administrators 6.22KiB 7y0d copy_share2\agnostic\flatfile.txt
d BUILTIN\Administrators 0 7y0d copy_share2\agnostic
d BUILTIN\Administrators 0 19h18m copy_share2

xcp scan -l -ownership \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 1s
STATUS : PASSED
```

scan -du

Summarize space usage of each directory, including subdirectories.

```
c:\netapp\xcp>xcp scan -du \\10.237.163.73\copy_share2
xcp scan -du \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

569KiB copy_share2\agnostic
```

```
19.8MiB copy_share2
```

```
xcp scan -du \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

scan -fmt <expression>

Formats file listing according to the defined expression.

```
c:\netapp\xcp>xcp scan -fmt "'", '.join(map(str, [reldpath, name, size, depth]))'
\\10.237.163.73\copy_share2
xcp scan -fmt "'", '.join(map(str, [reldpath, name, size, depth]))' \\10.237.163.73\copy_share2
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

copy_share2\ASUP.pm, ASUP.pm, 199239, 1
copy_share2\ASUP_REST.pm, ASUP_REST.pm, 35506, 1
copy_share2\Allflavors_v2.pm, Allflavors_v2.pm, 4204, 1
copy_share2\Armadillo.pm, Armadillo.pm, 39024, 1
copy_share2\AsupExtractor.pm, AsupExtractor.pm, 3924, 1
copy_share2\BTS_Config.pm, BTS_Config.pm, 71777, 1
copy_share2\Backup.pm, Backup.pm, 2714, 1
copy_share2\Aggregate.pm, Aggregate.pm, 61699, 1
copy_share2\Burt.pm, Burt.pm, 37780, 1
copy_share2\CConfig.pm, CConfig.pm, 9195, 1
copy_share2\CIFS.pm, CIFS.pm, 19779, 1
copy_share2\CR.pm, CR.pm, 21215, 1
copy_share2\CRC.pm, CRC.pm, 2337, 1
copy_share2\agnostic\LunCmds.pm, LunCmds.pm, 30962, 2
copy_share2\agnostic\ProtocolAccess.pm, ProtocolAccess.pm, 41868, 2
copy_share2\agnostic\Qtree.pm, Qtree.pm, 16057, 2
copy_share2\agnostic\Quota.pm, Quota.pm, 30018, 2
copy_share2\agnostic\RbacCmdFetcher.pm, RbacCmdFetcher.pm, 14067, 2
copy_share2\agnostic\RbacCmdFetcher_ReadMe, RbacCmdFetcher_ReadMe, 5685, 2
copy_share2\agnostic\SFXOD.pm, SFXOD.pm, 4019, 2
copy_share2\agnostic\Snapmirror.pm, Snapmirror.pm, 36624, 2
copy_share2\agnostic\VolEfficiency.pm, VolEfficiency.pm, 41344, 2
copy_share2\agnostic\flatfile.txt, flatfile.txt, 6366, 2
copy_share2\agnostic, agnostic, 0, 1
copy_share2, , 0, 0

xcp scan -fmt "'", '.join(map(str, [reldpath, name, size, depth]))' \\10.237.163.73\copy_share2
317 scanned, 0 matched, 0 errors
Total Time : 0s
STATUS : PASSED
```

12.6 copy

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

Notes:

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

Syntax

```
C:\xcp>xcp copy \\<source SMB share> \\<destination SMB share>
```

Example

```
c:\netapp\xcp>xcp copy \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp copy \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp copy \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
317 scanned, 0 matched, 316 copied, 0 errors
Total Time : 2s
STATUS : PASSED
```

Parameters

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

| 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>). |
| <code>copy -root</code> | Copy ACL for root directory |

copy --help

Displays detailed information about the `copy` command.

```
c:\netapp\xcp>xcp copy --help
xcp copy --help
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

usage: xcp copy [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-ctime]
               [-acl] [-fallback-user FALLBACK_USER]
               [-fallback-group FALLBACK_GROUP] [--loglevel <n>] [-newlog]
               [-root]
               source target

positional arguments:
  source
  target

optional arguments:
  -h, --help            show this help message and exit
  -v                    increase debug verbosity
  -parallel <n>         number of concurrent processes (default: <cpu-count>)
  -match <filter>       only process files and directories that match the
                        filter (see `xcp help -match` for details)
  -preserve-ctime       restore last accessed date on source
  -acl                  copy security information
  -fallback-user FALLBACK_USER
                        the name of the user on the target machine to receive
                        the permissions of local (non-domain) source machine
                        users (eg. domain\administrator)
  -fallback-group FALLBACK_GROUP
                        the name of the group on the target machine to receive
                        the permissions of local (non-domain) source machine
                        groups (eg. domain\administrators)
  -root                 copy acl for root directory

c:\netapp\xcp>
```

copy -v

Increase debug verbosity.

```
C:\XCP>xcp copy -v \\10.61.77.189\vol_SMB_source_XXXXXX\warning
\\10.61.77.56\vol_SMB_target_XXXXXX
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXXX XXXX[NetApp Inc] until Mon Dec 31 00:00:00
2029
```

```

ERROR failed to copy "write.exe": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\write.exe'
ERROR failed to copy "setuperr.log": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\setuperr.log'
ERROR failed to copy "splwow64.exe": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\splwow64.exe'
ERROR failed to copy "system.ini": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\system.ini'
ERROR failed to copy "vmgcoinstall.log": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\vmgcoinstall.log'
ERROR failed to copy "pyshellext.amd64.dll": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\pyshellext.amd64.dll'
ERROR failed to copy "win.ini": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\win.ini'
ERROR failed to copy "WindowsShell.Manifest": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\WindowsShell.Manifest'
ERROR failed to copy "WindowsUpdate.log": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\WindowsUpdate.log'
ERROR failed to copy "winhlp32.exe": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\winhlp32.exe'
ERROR failed to copy "py.exe": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\py.exe'
ERROR failed to copy "pyw.exe": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\pyw.exe'
ERROR failed to copy "regedit.exe": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\regedit.exe'
ERROR failed to copy "ServerStandard.xml": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\ServerStandard.xml'
ERROR failed to copy "ServerWeb.xml": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\ServerWeb.xml'
ERROR failed to copy "setupact.log": [Errno 13] Permission denied:
'\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\setupact.log'
17 scanned, 16 errors, 0 skipped, 0 copied, 0 (0/s), 1s
23 xcp copy -v \\10.61.77.189\\vol_SMB_source_XXXXXX\\warning \\10.61.77.56\\vol_SMB_target_XXXXXX
317 scanned, 0 matched, 300 copied, 16 errors
Total Time : 19s
STATUS : PASSED

```

copy -parallel <n>

Set a higher or lower number of XCP concurrent processes.

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

Note: The maximum value for n is 61.

```

c:\netapp\xcp>xcp copy -parallel 7 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp copy -parallel 7 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp copy -parallel 7 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
317 scanned, 0 matched, 316 copied, 0 errors
Total Time : 2s
STATUS : PASSED

```

copy -match <filter>

Copies only the data that matches the argument passed.

```

c:\netapp\xcp>xcp copy -match "'gx' in name" \\10.237.163.73\copy_share2
\\10.237.163.71\source_share
xcp copy -match "'gx' in name" \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp copy -match 'gx' in name \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
317 scanned, 5 matched, 4 copied, 0 errors
Total Time : 1s
STATUS : PASSED

```

copy -preserve-atime

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

```

c:\netapp\xcp>xcp copy -preserve-atime \\10.237.163.73\copy_share2
\\10.237.163.71\source_share
xcp copy -preserve-atime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share

```

```
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp copy -preserve-ctime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
317 scanned, 0 matched, 316 copied, 0 errors
Total Time : 2s
STATUS : PASSED
```

copy -acl

Activates the transfer of the security descriptors (ACLs).

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

12.7 sync

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

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

Syntax

```
C:\xcp>xcp sync \\<source SMB share> \\<destination SMB share>
```

Example

```
c:\netapp\xcp>xcp sync \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

Parameters

The following table lists the `sync` parameters 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 -noatime</code> | Do not check file access time. |
| <code>sync -noctime</code> | Do not check file creation time. |
| <code>sync -nomtime</code> | Do not check file modification time. (This option is deprecated. Sync will continue to run without this option.) |
| <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. |

| Feature | Description |
|--|---|
| <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. |
| <code>sync -root</code> | Sync ACL for root directory |

sync --help

Displays detailed information about the `sync` command.

```
c:\netapp\xcp>xcp help sync
xcp help sync
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

usage: xcp sync [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-atime]
               [-noatime] [-noctime] [-nomtime] [-noattrs]
               [-noownership] [-atimewindow <float>] [-ctimewindow <float>]
               [-mtimewindow <float>] [-acl] [-fallback-user FALLBACK_USER]
               [-fallback-group FALLBACK_GROUP] [--loglevel <n>] [-newlog]
               [-l] [-root]
               source target

Note: ONTAP does not let a SMB client modify COMPRESSED or ENCRYPTED attributes.
XCP sync will ignore these file attributes.

positional arguments:
  source
  target

optional arguments:
  -h, --help            show this help message and exit
  -v                    increase debug verbosity
  -parallel <n>         number of concurrent processes (default: <cpu-count>)
  -match <filter>       only process files and directories that match the filter
                        (see `xcp help -match` for details)
  -preserve-atime       restore last accessed date on source
  -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
                        the name of the user on the target machine to receive the permissions of
local (non-domain) source machine users (eg. domain\administrator)
  -fallback-group FALLBACK_GROUP
                        the name of the group on the target machine to receive the permissions of
local (non-domain) source machine groups (eg. domain\administrators)
  -l                    increase output detail
  -root                 sync acl for root directory

c:\netapp\xcp>
```

sync -v

Increase debug verbosity.

```

C:\XCP>xcp sync -v \\10.61.77.189\vol_SMB_source_XXXXXX\warning
\\10.61.77.56\vol_SMB_target_XXXXXX
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXXX XXXX[NetApp Inc] until Mon Dec 31 00:00:00
2029
ERROR failed to remove from target
"assembly\GAC_32\Microsoft.CertificateServices.PKIClient.Cmdlets\v4.0_6.3.0.0__31bf3856ad364e35\p
ki.psd1": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\vol_SMB_tar
shil\\assembly\\GAC_32\\Microsoft.CertificateServices.PKIClient.Cmdlets\\v4.0_6.3.0.0__31bf3856ad
364e35\\pki.psd1'
ERROR failed to remove from target
"assembly\GAC_64\Microsoft.GroupPolicy.AdmTmplEditor\v4.0_6.3.0.0__31bf3856ad364e35\Microsoft.Gro
upPolicy.AdmTmplEditor.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.
\\vol_SMB_target_XXXXXX\\assembly\\GAC_64\\Microsoft.GroupPolicy.AdmTmplEditor\\v4.0_6.3.0.0__31bf
3856ad364e35\\Microsoft.GroupPolicy.AdmTmplEditor.dll'
1,933 scanned, 1,361 compared, 2 errors, 0 skipped, 0 copied, 1,120 removed, 5s
ERROR failed to remove from target
"assembly\GAC_64\System.Printing\v4.0_4.0.0.0__31bf3856ad364e35\System.Printing.dll": [Errno 13]
Access is denied: '\\\\?\\UNC\\10.61.77.56\\vol_SMB_target_XXXXXX\\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\Micro
soft.PowerShell.Workflow.ServiceCore.dll": [Errno 13] Access is denied: '\\\\
\\10.61.77.56\\vol_SMB_target_XXXXXX\\assembly\\GAC_MSIL\\Microsoft.PowerShell.Workflow.ServiceCo
re\\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_XXXXXX\\assembly\\GAC_MSIL\\Microsoft.RightsManagementSe
rvices.ServerManager.DeploymentPlugin\\v4.0_6.3.0.0__31bf3856ad364e35\\Mic
.RightsManagementServices.ServerManager.DeploymentPlugin.dll'
ERROR failed to remove from target
"assembly\GAC_MSIL\Microsoft.WSMan.Management\v4.0_3.0.0.0__31bf3856ad364e35\Microsoft.WSMan.Mana
gement.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\vol_SMB
_XXXXXX\\assembly\\GAC_MSIL\\Microsoft.WSMan.Management\\v4.0_3.0.0.0__31bf3856ad364e35\\Microsof
t.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_XXXXXX\\assembly\
SIL\\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.Comp
ression.FileSystem.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.71.5
_SMB_target_XXXXXX\\assembly\\GAC_MSIL\\System.IO.Compression.FileSystem\\v4.0_4.0.0.0__b77a5c561
934e089\\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.IdentityM
odel.Selectors.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\v
s_target_XXXXXX\\assembly\\GAC_MSIL\\System.IdentityModel.Selectors\\v4.0_4.0.0.0__b77a5c561934e0
89\\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.DataVis
ualization.dll": [Errno 13] Access is denied: '\\\\?\\UNC\\10.61.77.56\\vol_c
rget_XXXXXX\\assembly\\GAC_MSIL\\System.Web.DataVisualization\\v4.0_4.0.0.0__31bf3856ad364e35\\Sy
stem.Web.DataVisualization.dll'
cp sync -v \\10.61.77.189\vol_SMB_source_XXXXXX\warning \\10.61.77.56\vol_SMB_target_XXXXXX
2,831 scanned, 0 copied, 2,831 compared, 0 removed, 10 errors
Total Time : 10s
STATUS : PASSED

```

sync-parallel <n>

Set a higher or lower number of XCP concurrent processes.

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

```

C:\xcp>xcp sync -parallel 5 \\10.61.87.235\volxcp \\10.216.50.212\xcp1_test1
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXXX XXXX[NetApp Inc] until Mon Dec 31 00:00:00
2029
658 scanned, 244 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 5s
658 scanned, 606 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10s
658 scanned, 658 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10s
Sending statistics...

```



```
C:\xcp>.
```

sync -match <filter>

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

```
c:\netapp\xcp>xcp sync -match "'gx' in name" \\10.237.163.73\copy_share2
\\10.237.163.71\source_share
xcp sync -match "'gx' in name" \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -match 'gx' in name \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 10 compared, 0 removed, 0 errors
Total Time : 2s
STATUS : PASSED
```

sync -preserve-atime

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

```
c:\netapp\xcp>xcp sync -preserve-atime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -preserve-atime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -preserve-atime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 4s
STATUS : PASSED
```

sync -noatime

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

```
c:\netapp\xcp>xcp sync -noatime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -noatime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -noatime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -noctime

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

```
c:\netapp\xcp>xcp sync -noctime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -noctime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -noctime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -nomtime

Syncs all the differences of the source to the target, but it ignores files that only have differences in modification time. (This option is deprecated. Sync will continue to run without this option.)

```
c:\netapp\xcp>xcp sync -nomtime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -nomtime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -nomtime \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -noattr

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

```
c:\netapp\xcp>xcp sync -noattr  \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -noattr  \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -noattr  \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -noownership

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

```
>xcp sync -noownership \\10.61.77.189\vol_SMB_source_XXXXXX \\10.61.77.56\vol_SMB_target_XXXXXX
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXXX XXXX[NetApp Inc] until Mon Dec 31 00:00:00
2029
-----Truncated Output -----
302,909 scanned, 301,365 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 9m46s
307,632 scanned, 303,530 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 9m51s
308,434 scanned, 305,462 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 9m56s
310,824 scanned, 307,328 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m1s
313,238 scanned, 310,083 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m6s
314,867 scanned, 313,407 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m11s
318,277 scanned, 315,856 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m17s
321,005 scanned, 318,384 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m22s
322,189 scanned, 321,863 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m27s
323,906 scanned, 323,906 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10m29s
xcp sync -noownership \\10.61.77.189\vol_SMB_source_XXXXXX \\10.61.77.56\vol_SMB_target_XXXXXX
323,906 scanned, 0 copied, 323,906 compared, 0 removed, 0 errors
Total Time : 10m29s
STATUS : PASSED
```

sync -atimewindow <float>

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

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

```
c:\netapp\xcp>xcp sync -atimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -atimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -atimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -ctimewindow <float>

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

```
c:\netapp\xcp>xcp sync -ctimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -ctimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -ctimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -mtimewindow <float>

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

```
c:\netapp\xcp>xcp sync -mtimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -mtimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
```

```
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp sync -mtimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

sync -acl

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

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

```
C:\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 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00
2029
10,796 scanned, 4,002 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 5s
15,796 scanned, 8,038 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10s
15,796 scanned, 8,505 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 15s
15,796 scanned, 8,707 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 20s
15,796 scanned, 8,730 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 25s
15,796 scanned, 8,749 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 30s
15,796 scanned, 8,765 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 35s
15,796 scanned, 8,786 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 40s
15,796 scanned, 8,956 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 45s
15,796 scanned, 9,320 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 50s
15,796 scanned, 9,339 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 55s
15,796 scanned, 9,363 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m0s
15,796 scanned, 10,019 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m5s
15,796 scanned, 10,042 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m10s
15,796 scanned, 10,059 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m15s
15,796 scanned, 10,075 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m20s
15,796 scanned, 10,091 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m25s
15,796 scanned, 10,108 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m30s
15,796 scanned, 10,929 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m35s
15,796 scanned, 12,443 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m40s
15,796 scanned, 13,963 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m45s
15,796 scanned, 15,488 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m50s
15,796 scanned, 15,796 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 1m51s
xcp sync --acl -fallback-user "DOMAIN\gabi" -fallback-group "DOMAIN\Group"
15,796 scanned, 0 copied, 15,796 compared, 0 removed, 0 errors
Total Time : 1m51s
STATUS : PASSED
```

sync -l

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

```
c:\netapp\xcp>xcp sync -l \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp sync -l \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

File "atime" changed, timestamps set for "agnostic"
File "atime" changed, timestamps set for "<root>"
xcp sync -l \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
634 scanned, 0 copied, 634 compared, 0 removed, 0 errors
Total Time : 3s
STATUS : PASSED
```

12.8 verify

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

Syntax

```
C:\xcp>xcp verify \\<source SMB share> \\<destination SMB share>
```

Example

```
c:\netapp\xcp>xcp verify -v -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
xcp verify -v -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -v -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

| Feature | Description |
|---------------------------------------|---|
| verify -h, --help | Show this help message and exit. |
| verify -v | Increase debug verbosity. |
| verify -parallel <n> | Number of concurrent processes (default: <cpu-count>). |
| verify -match <filter> | Only process files and directories that match the filter (see `xcp help -match` for details). |
| verify -preserve-atime | Restore last accessed date on source. |
| verify -nodata | Do not check data. |
| verify -noatime | Do not check file access time. |
| verify -noctime | Do not check file creation time. |
| verify -nomtime | Do not check file modification time. |
| verify -noattrs | Do not check attributes. |
| verify -noownership | Do not check ownership. |
| verify -noacls | Do not check ACLs. |
| verify -atimewindow <float> | Acceptable access time difference, in seconds. |
| verify -ctimewindow <float> | Acceptable creation time difference, in seconds. |
| verify -mtimewindow <float> | Acceptable modification time difference, in seconds. |
| verify -stats | Scan source and target trees in parallel and compare tree statistics. |
| verify -fallback-user FALLBACK_USER | A user on the target machine to translate the permissions of local (non-domain) source machine users (for example: domain\administrator) |
| verify -fallback-group FALLBACK_GROUP | A group on the target machine to translate the permissions of local (non-domain) source machine users (for example: domain\administrator) |
| verify -l | Detailed file listing output. |
| verify -root | Verify ACL for root directory |

verify --help

Displays detailed information about the `verify` command.

```
xcp verify --help
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

usage: xcp verify [-h] [-v] [-parallel <n>] [-match <filter>]
                [-preserve-atime] [-nodata] [-noatime] [-noctime] [-nomtime]
                [-noattrs] [-noownership] [-atimewindow <float>]
                [-ctimewindow <float>] [-mtimewindow <float>]
                [--loglevel <n>] [-newlog] [-fallback-user FALLBACK_USER]
                [-fallback-group FALLBACK_GROUP] [-noacls] [-stats] [-l]
                [-root]
                source target

Note: ONTAP does not let a SMB client modify COMPRESSED or ENCRYPTED attributes.
XCP sync will ignore these file attributes.

positional arguments:
  source
  target

optional arguments:
  -h, --help            show this help message and exit
  -v                    increase debug verbosity
  -parallel <n>         number of concurrent processes (default: <cpu-count>)
  -match <filter>       only process files and directories that match the filter
                        (see `xcp help -match` for details)
  -preserve-atime       restore last accessed date on source
  -nodata               do not check data
  -noatime              do not check file access time
  -noctime              do not check file creation time
  -nomtime              do not check file modification time
  -noattrs              do not check attributes
  -noownership          do not check ownership
  -noacls               do not check 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
  -fallback-user FALLBACK_USER
                        a user on the target machine to translate the permissions of local (non-
domain) source machine users (eg. domain\administrator)
  -fallback-group FALLBACK_GROUP
                        a group on the target machine to translate the permissions of local (non-
domain) source machine groups (eg. domain\administrators)
  -stats               scan source and target trees in parallel and compare tree statistics
  -l                   detailed file listing output
  -root                verify acl for root directory
```

verify -v

Increase debug verbosity.

```
c:\netapp\xcp>xcp verify -v -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
xcp verify -v -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -v -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -parallel <n>

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

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

Note: The maximum value for n is 61.

```
c:\netapp\xcp>xcp verify -v -noatime -parallel 8 \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -v -noatime -parallel 8 \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -v -noatime -parallel 8 \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 4s
STATUS : PASSED
```

verify -match <filter>

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

```
c:\netapp\xcp>xcp verify -v -match "'Microsoft' in name" \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -v -match "'Microsoft' in name" \\10.237.160.172\source_share
\\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -v -match 'Microsoft' in name \\10.237.160.172\source_share
\\10.237.160.169\dest_share
374 scanned, 0 compared, 0 same, 0 different, 0 missing, 0 errors
Total Time : 1s
STATUS : PASSED
```

verify -preserve-atime

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

```
c:\netapp\xcp>xcp verify -preserve-atime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -preserve-atime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

374 scanned, 179 compared, 179 same, 0 different, 0 missing, 0 errors, 5s
xcp verify -preserve-atime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 8s
STATUS : PASSED
```

verify -nodata

Do not compare data.

```
c:\netapp\xcp>xcp verify -nodata \\10.237.160.172\source_share \\10.237.160.169\dest_share
xcp verify -nodata \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -nodata \\10.237.160.172\source_share \\10.237.160.169\dest_share : PASSED
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -noatime

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

```
c:\netapp\xcp>xcp verify -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
xcp verify -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share : PASSED
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -noctime

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

```
c:\netapp\xcp>xcp verify -noctime -noatime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -noctime -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -noctime -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share : PASSED
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -nomtime

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

```
c:\netapp\xcp>xcp verify -nomtime -noatime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -nomtime -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -nomtime -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share : PASSED
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -noattrs

Do not check attributes.

```
c:\netapp\xcp>xcp verify -noattrs -noatime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -noattrs -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -noattrs -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share : PASSED
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -noownership

Do not check ownership.

```
c:\netapp\xcp>xcp verify -noownership -noatime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -noownership -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -noownership -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share :
PASSED
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -noacls

Do not check ACLs.

```
c:\netapp\xcp>xcp verify -noatime -noacls -noownership \\10.237.163.73\copy_share2
\\10.237.163.71\source_share
xcp verify -noatime -noacls -noownership \\10.237.163.73\copy_share2
\\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -noatime -noacls -noownership \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
318 scanned, 317 compared, 317 same, 0 different, 0 missing, 0 errors
Total Time : 1s
STATUS : PASSED
```

verify -atimewindow <float>

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

```
c:\netapp\xcp>xcp verify -atimewindow 600 \\10.237.163.73\copy_share2
\\10.237.163.71\source_share
xcp verify -atimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -atimewindow 600 \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
318 scanned, 317 compared, 317 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -ctimewindow <float>

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

```
c:\netapp\xcp>xcp verify -ctimewindow 600 -noatime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
```

```
xcp verify -ctimewindow 600 -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -ctimewindow 600 -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -mtimewindow <float>

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

```
c:\netapp\xcp>xcp verify -mtimewindow 600 -noatime \\10.237.160.172\source_share
\\10.237.160.169\dest_share
xcp verify -mtimewindow 600 -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -mtimewindow 600 -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -stats

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

```
c:\netapp\xcp>xcp verify -stats \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
xcp verify -stats \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
XCP <version>; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

    == Number of files ==
        empty    <8KiB    8-64KiB  64KiB-1MiB    1-10MiB    10-100MiB    >100MiB
on-target        81        170        62        2
on-source        same        same        same        same

    == Directory entries ==
        empty    1-10    10-100    100-1K    1K-10K    >10K
on-target        1        same        same
on-source        same        same

    == Depth ==
        0-5      6-10    11-15    16-20    21-100    >100
on-target    317
on-source    same

    == Modified ==
        >1 year  >1 month  1-31 days  1-24 hrs    <1 hour    <15 mins    future    invalid
on-target    315        2
on-source    same        same

Total count: 317 / same / same
Directories: 2 / same / same
Regular files: 315 / same / same
Symbolic links:
Junctions:
Special files:
xcp verify -stats \\10.237.163.73\copy_share2 \\10.237.163.71\source_share
635 scanned, 0 errors
Total Time : 1s
STATUS : PASSED
```

verify -l

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

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

```
c:\netapp\xcp>xcp verify -l -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
xcp verify -l -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
```



```
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -l -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -ll

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

```
c:\netapp\xcp>xcp verify -ll -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
xcp verify -ll -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029

xcp verify -ll -noatime \\10.237.160.172\source_share \\10.237.160.169\dest_share
374 scanned, 373 compared, 373 same, 0 different, 0 missing, 0 errors
Total Time : 3s
STATUS : PASSED
```

verify -fallback-user -fallback-group

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

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

verify -noownership -fallback-user -fallback-group

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

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

verify -noacls -fallback-user -fallback-group

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

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

verify -noacls -noownership

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

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

12.9 configure

The `configure` command configures the SMB system and connects to the system where the PostgreSQL database is running.

Syntax

```
c:\NetApp\XCP>xcp.exe configure
```

Example

```
C:\NetApp\XCP>xcp.exe configure
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
-----
Please choose the menu you want to start:
1. Configure xcp.ini file
0. Quit
-----
```

12.10 listen

The `listen` command reads the XCP binary and starts the XCP services.

Syntax

```
c:\NetApp\XCP>xcp.exe listen
```

Example

```
C:\NetApp\XCP>xcp.exe listen
XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
* Serving Flask app "xcp_rest_smb_app" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
```

13 XCP SMB Logging

XCP <version> supports log file rotation and log filtering based on severity level.

Log file rotation

The logging module creates a new log file when the existing log file size exceeds the 50 MB limit. When the xcp.log file reaches 50MB, the module copies the contents to xcp.log.1 and sends only new logs to the xcp.log file. When the xcp.log file reaches the 50MB limit again, the module copies the contents to xcp.log.1 and the copies the contents of xcp.log.1 to xcp.log.2 and so on for 10 log rotations (until xcp.log.10). On the next log rotation, the module deletes the contents of xcp.log.10 and copies the contents xcp.log.9 to xcp.log.10.

The xcp.log file always contains recent logs. To trace the logs generated by XCP, the command executed request searches in the xcp.log file first, then in the xcp.log.1 file and so on.

Log message filtering

XCP log messages support five severity levels in order of decreasing severity:

CRITICAL, ERROR, WARNING, INFO, DEBUG.

You can filter XCP Log messages by using the XCP CLI command option "--loglevel" to specify the severity level at which logging begins.

This option filters out XCP log messages so that messages with a severity level lower than that specified in the option are not logged in the log file.

Example:

```
xcp scan --loglevel debug \\10.234.123.227\test share mb
```

Log message format

All log messages are logged in the following format in the log file:

```
%(progName)s %(pid)s %(time.strftime)s %( self.name)s %( level)s: %( msg)s\n
```

Example:

```
2020-03-24 14:12:07,677 - INFO - xcp.main - 1836 - 2560 - XCP SMB 1.6; (c) 2020 NetApp, Inc.;
Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029
2020-03-24 14:12:07,709 - DEBUG - xcp.main - 1836 - 2560 - It appears that you are not running
XCP as Administrator. To avoid access issues please run XCP as Administrator.
2020-03-24 14:12:07,709 - INFO - xcp.main - 1836 - 2560 - User Name: ctladmin
```

13.1 Comparing XCP SMB Logging in XCP1.5 and XCP 1.6x

Table 9) Comparing XCP SMB Logging in XCP1.5 and XCP 1.6x.

| No | Item | XCP 1.5 | XCP1.6x |
|----|--------------------------------|---|--|
| 1. | XCP log file | All log messages are logged in a single file named "xcp.log". | All new log messages are logged in the file named "xcp.log". When the "xcp.log" file reaches 50 MB, the contents are copied to "xcp.log.1". XCP 1.6x supports 10 additional log files: the log files are rotated up to "xcp.log.10". |
| 2. | Log file location | xcp.log is created under the directory path: C:\NetApp\XCP\Logs | All log files are created under directory path: C:\NetApp\XCP\Logs The logs files are named "xcp.log", "xcp.log1", and so on up to "xcp.log.10" |
| 3. | Log message format | "%(progName)s%(pid)s %(time.strftime)s %(self.name)s%(level)s: %(msg)s\n" Example: xcp 2019-09-03 05:14:30 xcp: opened catalog | "%(asctime)s - %(levelname)s - %(process)d %(message)s" Example: 2020-03-24 14:12:07,709 - INFO - xcp.main - 1836 - 2560 - User Name: ctladmin |
| 4. | --loglevel command line option | Does not support option to filter log messages. | Supports option to filter XCP Log messages using the XCP CLI command option "--loglevel" to specify the severity level at which logging begins. Log message severity levels: [CRITICAL, ERROR, WARNING, INFO, DEBUG] Default severity level: "INFO" Note: The use of this option is recommended for "INFO" or DEBUG level messages only. |

| No | Item | XCP 1.5 | XCP1.6x | | | | | | | | | | | | | | |
|--------|---|--|---|------|-------------------------|------|----------------------------------|------|--|--------|-----|--------|---|--------|-----|--|--|
| 5 | Summary text for XCP commands: | Summary text displays in the following format: <list of applicable counters> <space> <throughput> <execution time> Example 161,951 scanned, 0 errors, 3m16s | Summary text displays in the following format: Line 1: <list of applicable counters> Line 3: Total Time: <execution time> Line 4: STATUS: <passed/failed> Example 317 scanned, 0 matched, 0 errors Total Time : 1s STATUS : PASSED | | | | | | | | | | | | | | |
| | <table><tr><th>Command</th><th>Counters</th></tr><tr><td>Scan</td><td>Scanned, Matched, Error</td></tr><tr><td>Copy</td><td>Scanned, Copied, Matched, Errors</td></tr><tr><td>Sync</td><td>Scanned, Copied, Compared, Removed, Errors</td></tr><tr><td>Resume</td><td>N/A</td></tr><tr><td>Verify</td><td>Scanned, Compared, Same, Different, Missing, Errors</td></tr><tr><td>Delete</td><td>N/A</td></tr></table> | Command | Counters | Scan | Scanned, Matched, Error | Copy | Scanned, Copied, Matched, Errors | Sync | Scanned, Copied, Compared, Removed, Errors | Resume | N/A | Verify | Scanned, Compared, Same, Different, Missing, Errors | Delete | N/A | | |
| | Command | Counters | | | | | | | | | | | | | | | |
| | Scan | Scanned, Matched, Error | | | | | | | | | | | | | | | |
| | Copy | Scanned, Copied, Matched, Errors | | | | | | | | | | | | | | | |
| | Sync | Scanned, Copied, Compared, Removed, Errors | | | | | | | | | | | | | | | |
| | Resume | N/A | | | | | | | | | | | | | | | |
| | Verify | Scanned, Compared, Same, Different, Missing, Errors | | | | | | | | | | | | | | | |
| Delete | N/A | | | | | | | | | | | | | | | | |

13.2 JSON Configuration for Logging

The following is an example logging configuration section in the `xcpLogConfig.json` JSON config file.

JSON config having "logConfig" option highlighted.

```
{
  "level": "INFO",
  "maxBytes": "52428800",
  "name": "xcp.log"
}
```

With this configuration you can filter messages according to their severity by selecting a valid `level` value from CRITICAL, ERROR, WARNING, INFO, and Debug.

The `maxBytes` setting lets you change the file size of the rotating log files. Here the default is 50MB. Setting the value to 0 will stop rotation and a single file will be created for all logs.

The `name` option configures the name of the log file.

If any key value pair is missing, the system uses the default value. Any mistake with the name of a key is treat as new key and that key will not affect how the systems works or system functionality.

14 Event logging for XCP SMB

XCP supports event messaging which you can enable using the `eventlog` option in the `xcpLogConfig.json` JSON config file. All events messages are written to the file `xcp_event.log` located in the default location `C:\NetApp\XCP\`.

To configure event messaging:

1. Create the `xcpLogConfig.json` JSON config file. For details, see the *Create the JSON Configuration File* section.
2. Set the `eventlog` option as required. For details, see the *Description of options of config file* section.

14.1 JSON Configuration for Event Messaging

The following is an example of JSON configuration to enable event messaging:

| Enabling 'eventlog' option using config file | Example config file with other options enabled with event log |
|--|--|
| <pre>{ "eventlog": { "isEnabled": true, "level": "INFO" }, "sanitize": false }</pre> | <pre>{ "logConfig": { "level": "DEBUG", "maxBytes": 52428800, "name": "xcp.log" }, "eventlog": { "isEnabled": true, "level": "INFO" }, "syslog": { "isEnabled": true, "level": "info", "serverIp": "10.234.219.87", "port": 514 }, "sanitize": false }</pre> |

| eventlog sub options | | | Description of eventlog sub options |
|----------------------|----------------|---------------|--|
| Sub option | JSON data type | Default Value | |
| "isEnabled" | Boolean | false | This boolean option is used to enable event messaging. Setting it <code>false</code> will not generate any event messages and no event logs will be published to event log file. |
| "level" | String | "INFO" | Event message severity filter level. Event messaging support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, and DEBUG |

For SMB event logs refer to the Event log for SMB.

15 XCP syslog client for SMB

XCP supports a syslog client to send XCP event log messages to a remote syslog receiver. It supports the UDP protocol with default port 514.

15.1 Configure syslog client for SMB

Enabling the syslog client requires configuring the `syslog` option in the `xcpLogConfig.json` JSON configuration file.

JSON configuration for configuring syslog client

The following example configuration of syslog:

| JSON config "syslog" option. |
|--|
| <pre>{ "syslog":{ "isEnabled":true, "level":"INFO", "serverIp":"10.234.219.87", "port":514 }, "sanitize":false }</pre> |

Description of options for syslog in JSON config

All following options are case sensitive.

| Sub options name for "syslog" config | JSON Data Type | Default | Description |
|--------------------------------------|----------------|---------|--|
| isEnabled | Boolean | false | This Boolean option enables the syslog client in XCP. Setting it to false will ignore the syslog configuration |
| level | String | "INFO" | This option is the message severity filter level. XCP event log messages support five severity levels in order of decreasing severity: CRITICAL, ERROR, WARNING, INFO, DEBUG |
| serverIp | string | None | This option lists the remote syslog server IP addresses or hostnames. |
| port | Integer | 514 | This option is the remote syslog receiver port. You can configure syslog receivers to accept syslog datagrams on a different port with this option. The default UDP port is 514. |

Option "sanitize": This is a common option not to be specified within "syslog" configuration. This option has a global scope and is common to logging, event log, and syslog within JSON

config. Setting this value to “true” will enable hiding sensitive information in syslog messages posted to the syslog server.

15.2 Format of syslog messages

Every syslog message sent to the remote syslog server over UDP is formatted as per RFC 5424 format.

The severity level as per RFC 5424 supported for syslog messages for XCP:

| Severity values | Severity level |
|-----------------|---------------------------------------|
| 3 | Error: error conditions |
| 4 | Warning: warning conditions |
| 6 | Informational: informational messages |
| 7 | Debug: debug-level messages |

In the syslog header, version has a value of 1 and the facility value for all messages for XCP is set to 1 (user-level messages).

$\text{<PRI> = syslog facility} * 8 + \text{severity value}$

XCP application syslog message format with syslog header:

| |
|---|
| Template: <PRI><version> <Time stamp> <hostname> xcp_smb - - - <XCP message> |
| Example syslog message: <14>1 2020-07-10T10:37:18.452Z bansala01 xcp_smb - - - INFO {"Event ID": 14, "Event Category": "XCP job status", "Event Type": "XCP scan completion", "Event Source": "NETAPP-01", "Description": "XCP scan is completed by scanning 17 items"} |

XCP application message without syslog header:

| |
|---|
| Template: <message severity level i.e CRITICAL, ERROR, WARNING, INFO, DEBUG> <XCP event log message> |
| Example message: INFO {"Event ID": 14, "Event Category": "XCP job status", "Event Type": "XCP scan completion", "Event Source": "NETAPP-01", "Description": "XCP scan is completed by scanning 17 items"} |

16 XCP SMB Use Cases

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

16.1 How to Transition 7-Mode SMB Storage to ONTAP

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

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.

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

| ✓ | Step | Description |
|---|------|--|
| | 1. | <p>Scan the SMB shares for the files and directories.</p> <pre> C:\xcp>xcp scan -stats \\10.61.77.189\performance_SMB_home_dirs XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 == 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 == Space used == empty <8KiB 8-64KiB 64KiB-1MiB 1-10MiB 10-100MiB >100MiB 0 6.80MiB 8.04MiB 120MiB 251MiB 3.64GiB 0 == Directory entries == empty 1-10 10-100 100-1K 1K-10K >10k 18 1 77 1 == Depth == 0-5 6-10 11-15 16-20 21-100 >100 7898 == Modified == >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. | <p>Copy the files (with or without ACL) from the source to the destination SMB share. The following example shows a copy with ACL.</p> <pre> C:\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 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 7,898 scanned, 0 errors, 0 skipped, 184 copied, 96.1MiB (19.2MiB/s), 5s 7,898 scanned, 0 errors, 0 skipped, 333 copied, 519MiB (84.7MiB/s), 10s 7,898 scanned, 0 errors, 0 skipped, 366 copied, 969MiB (89.9MiB/s), 15s 7,898 scanned, 0 errors, 0 skipped, 422 copied, 1.43GiB (99.8MiB/s), 20s 7,898 scanned, 0 errors, 0 skipped, 1,100 copied, 1.69GiB (52.9MiB/s), 25s 7,898 scanned, 0 errors, 0 skipped, 1,834 copied, 1.94GiB (50.4MiB/s), 30s 7,898 scanned, 0 errors, 0 skipped, 1,906 copied, 2.43GiB (100MiB/s), 35s 7,898 scanned, 0 errors, 0 skipped, 2,937 copied, 2.61GiB (36.6MiB/s), 40s 7,898 scanned, 0 errors, 0 skipped, 2,969 copied, 3.09GiB (100.0MiB/s), 45s 7,898 scanned, 0 errors, 0 skipped, 3,001 copied, 3.58GiB (100.0MiB/s), 50s 7,898 scanned, 0 errors, 0 skipped, 3,298 copied, 4.01GiB (88.0MiB/s), 55s 7,898 scanned, 0 errors, 0 skipped, 5,614 copied, 4.01GiB (679KiB/s), 1m0s 7,898 scanned, 0 errors, 0 skipped, 7,879 copied, 4.02GiB (445KiB/s), 1m5s 7,898 scanned, 0 errors, 0 skipped, 7,897 copied, 4.02GiB (63.2MiB/s), 1m5s </pre> <p>Note: If there is no data aggregate, create a new one using the storage aggr create command.</p> |
| | 3. | <p>Sync the files on the source and destination.</p> |

| ✓ | Step | Description |
|---|------|--|
| | | <pre> C:\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 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 10,796 scanned, 4,002 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 5s 15,796 scanned, 8,038 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 10s 15,796 scanned, 8,505 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 15s 15,796 scanned, 8,707 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 20s 15,796 scanned, 8,730 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 25s 15,796 scanned, 8,749 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 30s 15,796 scanned, 8,765 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 35s 15,796 scanned, 8,786 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 40s 15,796 scanned, 8,956 compared, 0 errors, 0 skipped, 0 copied, 0 removed, 45s 8 XCP vl.6 User Guide © 2020 NetApp, Inc. All rights reserved. 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 </pre> |
| | 4. | <p>Verify that the files are copied correctly.</p> <pre> C:\xcp> xcp verify \\10.61.77.189\performance_SMB_home_dirs \\10.61.77.56\performance_SMB_home_dir XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to xxxx xxxx[NetApp Inc] until Mon Dec 31 00:00:00 2029 8 compared, 8 same, 0 different, 0 missing, 5s 24 compared, 24 same, 0 different, 0 missing, 10s 41 compared, 41 same, 0 different, 0 missing, 15s 63 compared, 63 same, 0 different, 0 missing, 20s 86 compared, 86 same, 0 different, 0 missing, 25s 423 compared, 423 same, 0 different, 0 missing, 30s 691 compared, 691 same, 0 different, 0 missing, 35s 1,226 compared, 1,226 same, 0 different, 0 missing, 40s 1,524 compared, 1,524 same, 0 different, 0 missing, 45s 1,547 compared, 1,547 same, 0 different, 0 missing, 50s 1,564 compared, 1,564 same, 0 different, 0 missing, 55s 2,026 compared, 2,026 same, 0 different, 0 missing, 1m0s 2,045 compared, 2,045 same, 0 different, 0 missing, 1m5s 2,061 compared, 2,061 same, 0 different, 0 missing, 1m10s 2,081 compared, 2,081 same, 0 different, 0 missing, 1m15s 2,098 compared, 2,098 same, 0 different, 0 missing, 1m20s 2,116 compared, 2,116 same, 0 different, 0 missing, 1m25s 3,232 compared, 3,232 same, 0 different, 0 missing, 1m30s 4,817 compared, 4,817 same, 0 different, 0 missing, 1m35s 6,267 compared, 6,267 same, 0 different, 0 missing, 1m40s 7,844 compared, 7,844 same, 0 different, 0 missing, 1m45s 7,898 compared, 7,898 same, 0 different, 0 missing, 1m45s,cifs </pre> |

16.2 How to Migrate CIFS Data with ACLs from a Source Storage Box to ONTAP

This section covers the step-by-step procedure for migrating CIFS data with security information from a source to a target ONTAP system

Task Table 8) Migrating CIFS Data with ACLs from a Source Storage Box to ONTAP.

| ✓ | Step | Description |
|---|------|---|
| | 1. | <div>Verify that the target ONTAP system is healthy.</div> <div>C1_sti96-vsimsim-ucs540m_cluster::> cluster show Node Health Eligibility ----- sti96-vsimsim-ucs540m true true sti96-vsimsim-ucs540n true true 2 entries were displayed.</div> <div>C1_sti96-vsimsim-ucs540m_cluster::> node show Node Health Eligibility Uptime Model Owner Location ----- sti96-vsimsim-ucs540m true true 15 days 21:17 SIMBOX ahammed sti sti96-vsimsim-ucs540n true true 15 days 21:17 SIMBOX ahammed sti 2 entries were displayed.</div> <div>cluster::> storage failover show Takeover Node Partner Possible State Description ----- sti96-vsimsim-ucs540m sti96-vsimsim-ucs540n true Connected to sti96-vsimsim-ucs540n sti96-vsimsim-ucs540n sti96-vsimsim-ucs540m true Connected to sti96-vsimsim-ucs540m 2 entries were displayed.</div> <div>C1_sti96-vsimsim-ucs540m_cluster::></div> |
| | 2. | <div>Verify that at least one non-root aggregate exists on the target system. The aggregate is normal.</div> <div>cluster::*> storage aggregate show Aggregate Size Available Used% State #Vols Nodes RAID Status ----- aggr0_sti96_vsimsim_ucs540o 7.58GB 373.3MB 95% online 1 sti96-vsimsim-ucs540o raid_dp, normal aggr0_sti96_vsimsim_ucs540p 7.58GB 373.3MB 95% online 1 sti96-vsimsim-ucs540p raid_dp, normal aggr_001 103.7GB 93.63GB 10% online 1 sti96-vsimsim-ucs540p raid_dp, normal sti96_vsimsim_ucs540o_aggr1 23.93GB 23.83GB 0% online 1 sti96-vsimsim-ucs540o raid_dp, normal sti96_vsimsim_ucs540p_aggr1 23.93GB 23.93GB 0% online 0 sti96-vsimsim-ucs540p raid_dp, normal 5 entries were displayed.</div> <div>Note: If there is no data aggregate, create a new one using the storage aggr create command.</div> |
| | 3. | <div>Create an SVM on the target cluster system.</div> <div>cluster::*> vservers create -vservers vs1 -rootvolume root_vs1 -aggregate sti96_vsimsim_ucs540o_aggr1 -rootvolume-security-style mixed</div> <div>Verify the SVM was created.</div> <div>C2_sti96-vsimsim-ucs540o_cluster::*> vservers show -vservers vs1 Vserver: vs1</div> |

| ✓ | Step | Description | | | | | | | | | | | | | | |
|---------|--------------------------|---|----------------------|--------------------|-------------------|----------------------|--------------|--------------|--------------|-----|--------------------------|-------|------------------------|--------------------|-----|------|
| | | <div>Vserver Type: data</div> <div>Vserver Subtype: default</div> <div>Vserver UUID: f8bc54be-d91b-11e9-b99c-005056a7e57e</div> <div>Root Volume: root_vs1</div> <div>Aggregate: sti96_vsim_ucs540o_aggr1</div> <div>NIS Domain: NSQA-RTP-NIS1</div> <div>Root Volume Security Style: mixed</div> <div>LDAP Client: esisconfig</div> <div>Default Volume Language Code: C.UTF-8</div> <div>Snapshot Policy: default</div> <div>Data Services: data-nfs, data-cifs, data-flexcache, data-iscsi</div> <div>Comment: vs1</div> <div>Quota Policy: default</div> <div>List of Aggregates Assigned: -</div> <div>Limit on Maximum Number of Volumes allowed: unlimited</div> <div>Vserver Admin State: running</div> <div>Vserver Operational State: running</div> <div>Vserver Operational State Stopped Reason: -</div> <div>Allowed Protocols: nfs, cifs, fcp, iscsi, ndmp</div> <div>Disallowed Protocols: -</div> <div>Is Vserver with Infinite Volume: false</div> <div>QoS Policy Group: -</div> <div>Caching Policy Name: -</div> <div>Config Lock: false</div> <div>Volume Delete Retention Period: 0</div> <div>IPspace Name: Default</div> <div>Foreground Process: -</div> <div>Is Msid Preserved for DR: false</div> <div>Force start required to start Destination in multiple IDP fan-out case: false</div> <div>Logical Space Reporting: false</div> <div>Logical Space Enforcement: false</div> | | | | | | | | | | | | | | |
| | 4. | <div>Create a new read-write data volume on the destination SVM. Verify that the security style, language settings, and capacity requirements match the source volume.</div> <div>CLUSTER CLUSTER::> vol create -vserver vs1 -volume dest_vol -aggregate aggr_001 -size 150g type RW -state online -security-style ntfs</div> | | | | | | | | | | | | | | |
| | 5. | <div>Create a data LIF to serve SMB client requests.</div> <div>CLUSTER::> network interface create -vserver vs1 -lif sti96-vsim-ucs540o_data1 -address 10.237.165.87 -netmask 255.255.240.0 -role data -data-protocol nfs,cifs -home-node sti96-vsim-ucs540o -home-port e0d</div> <div>Verify the LIF is successfully created.</div> <div>cluster::*> network interface show -vserver vs1</div> <table><tr><th>Vserver</th><th>Logical Interface</th><th>Status Admin/Oper</th><th>Network Address/Mask</th><th>Current Node</th><th>Current Port</th><th>Is Home</th></tr><tr><td>vs1</td><td>sti96-vsim-ucs540o_data1</td><td>up/up</td><td>10.237.165.87/20</td><td>sti96-vsim-ucs540o</td><td>e0d</td><td>true</td></tr></table> | Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home | vs1 | sti96-vsim-ucs540o_data1 | up/up | 10.237.165.87/20 | sti96-vsim-ucs540o | e0d | true |
| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home | | | | | | | | | | |
| vs1 | sti96-vsim-ucs540o_data1 | up/up | 10.237.165.87/20 | sti96-vsim-ucs540o | e0d | true | | | | | | | | | | |
| | 6. | <div>Create a static route with the SVM if required</div> <div>network route create -vserver dest -destination 0.0.0.0/0 -gateway 10.237.160.1</div> <div>Verify the route is created</div> <div>cluster::*> network route show -vserver vs1</div> <table><tr><th>Vserver</th><th>Destination</th><th>Gateway</th><th>Metric</th></tr><tr><td>vs1</td><td>0.0.0.0/0</td><td>10.237.160.1</td><td>20</td></tr><tr><td></td><td>::/0</td><td>fd20:8b1e:b255:9155::1</td><td>20</td></tr></table> <div>2 entries were displayed.</div> | Vserver | Destination | Gateway | Metric | vs1 | 0.0.0.0/0 | 10.237.160.1 | 20 | | ::/0 | fd20:8b1e:b255:9155::1 | 20 | | |
| Vserver | Destination | Gateway | Metric | | | | | | | | | | | | | |
| vs1 | 0.0.0.0/0 | 10.237.160.1 | 20 | | | | | | | | | | | | | |
| | ::/0 | fd20:8b1e:b255:9155::1 | 20 | | | | | | | | | | | | | |

| ✓ | Step | Description | | | | | | | | | | |
|---------|-----------------|---|-----------------------|----------------------|--------------|-----------------------|----------------------|-----|-----------------|----|-----|--------|
| | 7. | <div>Mount the target data volume in the SVM namespace.</div> <div>CLUSTER::> volume mount -vserver vs1 -volume dest_vol -junction-path /dest_vol -active true</div> <div>Verify the volume is successfully mounted</div> <div>cluster::*> volume show -vserver vs1 -fields junction-path vserver volume junction-path ----- vs1 dest_vol /dest_vol vs1 root_vs1 / 2 entries were displayed.</div> <div>Note: You can also specify volume mount options (junction path) with the volume create command.</div> | | | | | | | | | | |
| | 8. | <div>Start the CIFS service on the target SVM.</div> <div>cluster::*> vserver cifs start -vserver vs1</div> <div>Warning: The admin status of the CIFS server for Vserver "vs1" is already "up".</div> <div>Verify the service is started and running</div> <div>cluster::*> Verify the service is started and running C2_sti96-vsim-ucs540o_cluster::*> cifs show <table><tr><th>Vserver</th><th>Server Name</th><th>Status Admin</th><th>Domain/Workgroup Name</th><th>Authentication Style</th></tr><tr><td>vs1</td><td>D60AB15C2AFC4D6</td><td>up</td><td>CTL</td><td>domain</td></tr></table></div> | Vserver | Server Name | Status Admin | Domain/Workgroup Name | Authentication Style | vs1 | D60AB15C2AFC4D6 | up | CTL | domain |
| Vserver | Server Name | Status Admin | Domain/Workgroup Name | Authentication Style | | | | | | | | |
| vs1 | D60AB15C2AFC4D6 | up | CTL | domain | | | | | | | | |
| | 9. | <div>Check that the default export policy is applied to the target SVM.</div> <div>CLUSTER::> vserver export-policy show -vserver dest <table><tr><th>Vserver</th><th>Policy Name</th></tr><tr><td>dest</td><td>default</td></tr></table></div> <div>If required, create a new custom export policy for the target SVM.</div> <div>CLUSTER::> vserver export-policy create -vserver vs1 -policyname xcpexport</div> | Vserver | Policy Name | dest | default | | | | | | |
| Vserver | Policy Name | | | | | | | | | | | |
| dest | default | | | | | | | | | | | |
| | 10. | <div>Modify the export policy rules to allow access to CIFS clients.</div> <div>CLUSTER::> export-policy rule modify -vserver dest -ruleindex 1 -policyname xcpexportpolicy -clientmatch 0.0.0.0/0 -rorule any -rwrule any -anon 0</div> <div>Verify the policy rules have modified.</div> <div>cluster::*> export-policy rule show -instance Vserver: vs1 Policy Name: default Rule Index: 1 Access Protocol: any List of Client Match Hostnames, IP Addresses, Netgroups, or Domains: 0.0.0.0/0 RO Access Rule: any RW Access Rule: any User ID To Which Anonymous Users Are Mapped: 65534 Superuser Security Types: any Honor SetUID Bits in SETATTR: true Allow Creation of Devices: true NTFS Unix Security Options: fail Vserver NTFS Unix Security Options: use_export_policy Change Ownership Mode: restricted Vserver Change Ownership Mode: use_export_policy Policy ID: 12884901889 Vserver: vs1</div> | | | | | | | | | | |

| ✓ | Step | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---------------------------|--|------------------------------|---------------|------------|-------------------|------------|---------------|------------|------------|---------------------|------------|-------------|-------------|------------|----------|------------------------------|---------------|------------|------------|---|---------------------------|-----|---|-----------|------------------|-----------------------|-----|----------|---------------------------|---|---------------------|-----|-------|-------|--------|--------------|----------|--|------------|----------|--|---------|----------|--|-----------|----------|--------------------------|--------------------------------------|--------------|--|-------|---------------------------|--|
| | | <div>Policy Name: default</div> <div>Rule Index: 2</div> <div>Access Protocol: any</div> <div>List of Client Match Hostnames, IP Addresses, Netgroups, or Domains: 0:0:0:0:0:0:0/0</div> <div>RO Access Rule: any</div> <div>RW Access Rule: any</div> <div>User ID To Which Anonymous Users Are Mapped: 65534</div> <div>Superuser Security Types: none</div> <div>Honor SetUID Bits in SETATTR: true</div> <div>Allow Creation of Devices: true</div> <div>NTFS Unix Security Options: fail</div> <div>Vserver NTFS Unix Security Options: use_export_policy</div> <div>Change Ownership Mode: restricted</div> <div>Vserver Change Ownership Mode: use_export_policy</div> <div>Policy ID: 12884901889</div> <div>2 entries were displayed.</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 11. | <div>Verify that the client is allowed access to the volume.</div> <div>cluster::*> export-policy check-access -vserver vs1 -volume dest_vol -client-ip 10.234.17.81 -authentication-method none -protocol cifs -access-type read-write</div> <table><thead><tr><th>Path</th><th>Policy</th><th>Owner</th><th>Policy Owner Type</th><th>Rule Index</th><th>Access</th></tr></thead><tbody><tr><td>/</td><td>default</td><td>root_vs1</td><td>volume</td><td>1</td><td>read</td></tr><tr><td>/dest_vol</td><td>default</td><td>dest_vol</td><td>volume</td><td>1</td><td>read-write</td></tr></tbody></table> <div>2 entries were displayed.</div> | Path | Policy | Owner | Policy Owner Type | Rule Index | Access | / | default | root_vs1 | volume | 1 | read | /dest_vol | default | dest_vol | volume | 1 | read-write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Path | Policy | Owner | Policy Owner Type | Rule Index | Access | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| / | default | root_vs1 | volume | 1 | read | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| /dest_vol | default | dest_vol | volume | 1 | read-write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12. | <div>Connect to the windows client system where XCP is installed. Browse to the XCP install path.</div> <div>C:\WRSHDNT>dir c:\netapp\xcp</div> <div>dir c:\netapp\xcp</div> <div>Volume in drive C has no label.</div> <div>Volume Serial Number is 5C04-C0C7</div> <div>Directory of c:\netapp\xcp</div> <table><tbody><tr><td>09/18/2019</td><td>09:30 AM</td><td><DIR></td><td>.</td></tr><tr><td>09/18/2019</td><td>09:30 AM</td><td><DIR></td><td>..</td></tr><tr><td>06/25/2019</td><td>06:27 AM</td><td></td><td>304 license</td></tr><tr><td>09/18/2019</td><td>09:30 AM</td><td><DIR></td><td>Logs</td></tr><tr><td>09/29/2019</td><td>08:45 PM</td><td></td><td>12,143,105 xcp.exe</td></tr><tr><td></td><td></td><td>2 File(s)</td><td>12,143,409 bytes</td></tr><tr><td></td><td></td><td>3 Dir(s)</td><td>29,219,549,184 bytes free</td></tr></tbody></table> | 09/18/2019 | 09:30 AM | <DIR> | . | 09/18/2019 | 09:30 AM | <DIR> | .. | 06/25/2019 | 06:27 AM | | 304 license | 09/18/2019 | 09:30 AM | <DIR> | Logs | 09/29/2019 | 08:45 PM | | 12,143,105 xcp.exe | | | 2 File(s) | 12,143,409 bytes | | | 3 Dir(s) | 29,219,549,184 bytes free | | | | | | | | | | | | | | | | | | | | | | | | |
| 09/18/2019 | 09:30 AM | <DIR> | . | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 09/18/2019 | 09:30 AM | <DIR> | .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 06/25/2019 | 06:27 AM | | 304 license | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 09/18/2019 | 09:30 AM | <DIR> | Logs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 09/29/2019 | 08:45 PM | | 12,143,105 xcp.exe | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2 File(s) | 12,143,409 bytes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3 Dir(s) | 29,219,549,184 bytes free | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 13. | <div>Query the source node SMB exports by running the xcp show command on the XCP windows client host system.</div> <div>C:\WRSHDNT>c:\netapp\xcp\xcp show \\10.237.165.71</div> <div>c:\netapp\xcp\xcp show \\10.237.165.71</div> <div>XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029</div> <table><thead><tr><th>Shares</th><th>Errors</th><th>Server</th></tr></thead><tbody><tr><td>6</td><td>0</td><td>10.237.165.71</td></tr></tbody></table> <div>== SMB Shares ==</div> <table><thead><tr><th>Space Free</th><th>Space Used</th><th>Current Connections</th><th>Share Path</th><th>Folder Path</th></tr></thead><tbody><tr><td>9.50GiB</td><td>4.57MiB</td><td>1</td><td>\\10.237.165.71\source_share</td><td>C:\source_vol</td></tr><tr><td>94.3MiB</td><td>716KiB</td><td>0</td><td>\\10.237.165.71\ROOTSHARE</td><td>C:\</td></tr><tr><td>0</td><td>0</td><td>N/A</td><td>\\10.237.165.71\ipc\$</td><td>N/A</td></tr><tr><td>94.3MiB</td><td>716KiB</td><td>0</td><td>\\10.237.165.71\c\$</td><td>C:\</td></tr></tbody></table> <div>== Attributes of SMB Shares ==</div> <table><thead><tr><th>Share</th><th>Types</th><th>Remark</th></tr></thead><tbody><tr><td>source_share</td><td>DISKTREE</td><td></td></tr><tr><td>test share</td><td>DISKTREE</td><td></td></tr><tr><td>test_sh</td><td>DISKTREE</td><td></td></tr><tr><td>ROOTSHARE</td><td>DISKTREE</td><td>\"Share mapped to top of</td></tr><tr><td>Vserver global namespace, created by</td><td>deux_init \"</td><td></td></tr><tr><td>ipc\$</td><td>PRINTQ,SPECIAL,IPC,DEVICE</td><td></td></tr></tbody></table> | Shares | Errors | Server | 6 | 0 | 10.237.165.71 | Space Free | Space Used | Current Connections | Share Path | Folder Path | 9.50GiB | 4.57MiB | 1 | \\10.237.165.71\source_share | C:\source_vol | 94.3MiB | 716KiB | 0 | \\10.237.165.71\ROOTSHARE | C:\ | 0 | 0 | N/A | \\10.237.165.71\ipc\$ | N/A | 94.3MiB | 716KiB | 0 | \\10.237.165.71\c\$ | C:\ | Share | Types | Remark | source_share | DISKTREE | | test share | DISKTREE | | test_sh | DISKTREE | | ROOTSHARE | DISKTREE | \"Share mapped to top of | Vserver global namespace, created by | deux_init \" | | ipc\$ | PRINTQ,SPECIAL,IPC,DEVICE | |
| Shares | Errors | Server | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 10.237.165.71 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Space Free | Space Used | Current Connections | Share Path | Folder Path | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9.50GiB | 4.57MiB | 1 | \\10.237.165.71\source_share | C:\source_vol | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94.3MiB | 716KiB | 0 | \\10.237.165.71\ROOTSHARE | C:\ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | N/A | \\10.237.165.71\ipc\$ | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94.3MiB | 716KiB | 0 | \\10.237.165.71\c\$ | C:\ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Share | Types | Remark | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| source_share | DISKTREE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| test share | DISKTREE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| test_sh | DISKTREE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROOTSHARE | DISKTREE | \"Share mapped to top of | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vserver global namespace, created by | deux_init \" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ipc\$ | PRINTQ,SPECIAL,IPC,DEVICE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ✓ | Step | Description |
|---|------|--|
| | | <pre> c\$ SPECIAL == Permissions of SMB Shares == Share Entity Type source_share Everyone Allow/Full Control ROOTSHARE Everyone Allow/Full Control ipc\$ Everyone Allow/Full Control c\$ Administrators Allow/Full Control/ </pre> |
| | 14. | <p>Run help command for copy</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp help copy c:\netapp\xcp\xcp help copy XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029 usage: xcp copy [-h] [-v] [-parallel <n>] [-match <filter>] [-preserve-atime] [-acl] [-fallback-user FALLBACK_USER] [-fallback-group FALLBACK_GROUP] [-root] source target positional arguments: source target 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 the name of the user on the target machine to receive the permissions of local (non-domain) source machine users (eg. domain\administrator) -fallback-group FALLBACK_GROUP the name of the group on the target machine to receive the permissions of local (non-domain) source machine groups (eg. domain\administrators) -root copy acl for root directorytxt </pre> |
| | 15. | <p>On the target ONTAP system, get the list of local user and local group names that you need to provide as values for the fallback-user and fallback-group arguments path.</p> <pre> cluster::*> local-user show (vserver cifs users-and-groups local-user show) Vserver User Name Full Name Description ----- vs1 D60AB15C2AFC4D6\Administrator Built-in administrator account C2_sti96-vs1-ucs540o_cluster::*> local-group show (vserver cifs users-and-groups local-group show) Vserver Group Name Description ----- vs1 BUILTIN\Administrators Built-in Administrators group vs1 BUILTIN\Backup Operators Backup Operators group vs1 BUILTIN\Guests Built-in Guests Group vs1 BUILTIN\Power Users Restricted administrative privileges vs1 BUILTIN\Users All users 5 entries were displayed </pre> |
| | 16. | <p>Use xcp copy command with '-acl -fallback-user/group' options to migrate CIFS data with ACLs from the source to target.</p> |

| ✓ | Step | Description |
|---|------|--|
| | | <p>For fallback-user/group options you can specify any user/group that can be found in Active Directory or local user/group to target system.</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator -fallback- group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 8s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 13s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 18s ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "BUILTIN\Users". Please check if the principal with the name "BUILTIN\Users" exists on "D60AB15C2AFC4D6". 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 23s ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\Administrator". Please check if the principal with the name "D60AB15C2AFC4D6\Administrator" exists on "D60AB15C2AFC4D6". 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 28s 753 scanned, 0 errors, 0 skipped, 249 copied, 24.0KiB (4.82KiB/s), 33s 753 scanned, 0 errors, 0 skipped, 744 copied, 54.4KiB (6.07KiB/s), 38s 753 scanned, 0 errors, 0 skipped, 746 copied, 54.5KiB (20/s), 43s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (1.23KiB/s), 44s C:\WRSHDNT> </pre> |
| | 17. | <p>If xcp copy results in the error message: 'ERROR failed to obtain fallback security principal', add the destination box in the hosts file (C:\Windows\System32\drivers\etc\hosts). Netapp storage destination box entry should be in below format:</p> <p><data vserver data interface ip> 1 or more white spaces <cifs server name></p> <pre> cluster::*> cifs show Server Status Domain/Workgroup Authentication Vserver Name Admin Name Style ----- vs1 D60AB15C2AFC4D6 up CTL domain C2_sti96-vsim-ucs540o_cluster::*> network interface show Logical Status Network Current Current Is Cluster sti96-vsim-ucs540p_clus1 up/up 192.168.148.136/24 sti96-vsim-ucs540p e0a true sti96-vsim-ucs540p_clus2 up/up 192.168.148.137/24 sti96-vsim-ucs540p e0b true vs1 sti96-vsim-ucs540o_data1 up/up 10.237.165.87/20 sti96-vsim-ucs540o e0d true sti96-vsim-ucs540o_data1_inet6 up/up fd20:8b1e:b255:9155::583/64 sti96-vsim-ucs540o </pre> |

| ✓ | Step | Description |
|---|------|---|
| | | <pre> sti96-vsim-ucs540o_data2 up/up 10.237.165.88/20 sti96-vsim-ucs540o e0d true e0e true 10.237.165.87 D60AB15C2AFC4D6 -> destination box entry to be added in hosts file. </pre> |
| | 18. | <p>If you still get the error message 'ERROR failed to obtain fallback security principal' after adding the destination box entry in the hosts files, the user/group does not exist in the target system.</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\unknown_user -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\unknown_user -fallback- group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029 ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6". ERROR failed to obtain fallback security principal "D60AB15C2AFC4D6\unknown_user". Please check if the principal with the name "D60AB15C2AFC4D6\unknown_user" exists on "D60AB15C2AFC4D6". 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 5s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 10s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 15s 753 scanned, 0 errors, 0 skipped, 284 copied, 27.6KiB (5.54KiB/s), 20s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (2.44KiB/s), 22s C:\WRSHDNT> </pre> |
| | 19. | <p>Use xcp copy to migrate CIFs data with ACLs (with or without the root folder).</p> <p>Without the root folder:</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -fallback-user D60AB15C2AFC4D6\Administrator - fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 5s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 10s 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 15s 753 scanned, 0 errors, 0 skipped, 210 copied, 20.4KiB (4.08KiB/s), 20s 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (2.38KiB/s), 22s C:\WRSHDNT> </pre> <p>With the root folder:</p> <pre> C:\WRSHDNT>c:\netapp\xcp\xcp copy -acl -root -fallback-user D60AB15C2AFC4D6\Administrator -fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share c:\netapp\xcp\xcp copy -acl -root -fallback-user D60AB15C2AFC4D6\Administrator - fallback-group BUILTIN\Users \\10.237.165.79\source_share \\10.237.165.89\dest_share XCP SMB 1.6; (c) 2020 NetApp, Inc.; Licensed to XXX [NetApp Inc] until Mon Dec 31 00:00:00 2029 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 5s </pre> |

| ✓ | Step | Description |
|---|------|--|
| | | 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 10s |
| | | 753 scanned, 0 errors, 0 skipped, 0 copied, 0 (0/s), 15s |
| | | 753 scanned, 0 errors, 0 skipped, 243 copied, 23.6KiB (4.73KiB/s), 20s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (6.21KiB/s), 25s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 30s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 35s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 40s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 45s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 50s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 55s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 1m0s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (0/s), 1m5s |
| | | 753 scanned, 0 errors, 0 skipped, 752 copied, 54.7KiB (817/s), 1m8s |
| | | C:\WRSHDNT> |

17 XCP File Analytics

NetApp XCP File Analytics is host-based software that detects file shares, runs scans on the file system, and provides a dashboard for File Analytics. XCP File Analytics solution works for both NetApp and non-NetApp systems and runs on Linux or Windows host.

17.1 Overview

NetApp XCP File Analytics uses the XCP scan API to collect data from NFS or SMB hosts. This data is then displayed on XCP File Analytics GUI. There are three main components involved in XCP File Analytics:

1. XCP service
2. File Analytics database
3. File Analytics GUI to manage and view data

The deployment method for XCP File Analytics components depends on the solution required:

1. Deploying XCP File Analytics solutions for NFS file systems

You can deploy the File Analytics GUI, database and XCP service in the same Linux host.

2. Deploying XCP File Analytics solutions for SMB file systems

You need to deploy the File Analytics GUI and database in a Linux host and deploy the XCP service in a Windows host.

17.2 Downloading and Activating the XCP License

1. Download and install the latest version of XCP that supports File Analytics from the [NetApp Support site](#).
2. Download the XCP license file from <https://xcp.netapp.com/>
3. Copy the NETAPP_XCP_<version>.tgz file from the output file to the user workspace and extract the NETAPP_XCP_<version>.tgz. file:

```
# sudo tar -xzf ./NETAPP_XCP_<version>.tgz
```

The extracted folder named “xcp” contains the following files:

- README – Instructions for configuring XCP File Analytics
- Configure.sh – Shell script for configuring a Linux machine
- Linux folder – Linux XCP binary
- Windows folder – Windows XCP binary
- Xcp_gui folder – File Analytics GUI binary

4. Copy the license to /opt/NetApp/xFiles/xcp:

```
# cp license /opt/NetApp/xFiles/xcp
```

Note: Create the folder </opt/NetApp/xFiles/xcp>, if it does not already exist.

5. Activate the license:

```
# XCP <version>; (c) 2020 NetApp, Inc.; Licensed to xxxxxx xxxxxx [NetApp Inc] until Mon Feb 10
22:45:49 2029
# ./xcp activate
XCP already activated
```

17.3 Configuring XCP File Analytics on a Linux Machine

The configure.sh script will install and enable default configurations of HTTPD and PostgreSQL available for Red Hat Enterprise Linux server. You can change/update to a more recent version as needed and to adhere to security guidelines.

Before you begin

- You cannot run the XCP application and XCP as service simultaneously in the same host. If XCP scan or copy operations are running, complete the operations before you start configuration.
 - Your Linux machine must be connected to the Yum repository server or the internet.
 - Ensure /etc/sysctl.conf is updated as outlined in [Section 2 XCP NFS](#).
1. Go to your XCP folder and run the ./configure.sh script. The script takes 3- 10 min to configure the Linux machine and complete the following tasks:
 - Check for running XCP processes if any
 - Download PostgreSQL packages and Install the PostgreSQL server
 - Install the HTTPD
 - Use Open SSL to create a self-signed certificate (server.key & server.crt)
 - Create the XCP File Analytics database
 - Start the XCP service
 2. In the XCP configuration menu, select option 1. Configure client system
 3. Set a password for the PostgreSQL database.
 4. Set a GUI login password for the “admin” user account.
 5. Use the following command to check that XCP is running as a service:

```
service xcp status
```

6. Use the link “https://<ip addr of linux>/xcp” to start using the File Analytics GUI.
For more information see [XCP File Analytics GUI](#)

17.4 Configuring XCP File Analytics on a Windows Machine

Before you begin

- You need to configure XCP File Analytics on a Linux machine to use the XCP SMB service.
 - When XCP File Analytics is running on your Linux machine you can begin configuring XCP File Analytics on a Windows machine.
1. Copy the xcp.exe file to your Windows C: drive.
 2. Download the XCP license file from <https://xcp.netapp.com/>
 3. Create folder C:\NetApp\XCP and copy the XCP license to this location.
 4. Use the “xcp.exe activate” command to activate the XCP license.
 5. Copy the server.key and server.crt files from the /opt/NetApp/xFiles/xcp/ location to the C:\NetApp\XCP folder. If you have a CA certificate, place the certificate in this location with the same name and extensions.

6. To run the service on the windows machine, run the `xcp listen` command with administrator privilege on the command prompt. This will make SMB agent entry in Postgres database.
7. If you have configured a SMB agent and SMB service is already running, you can see the SMB agent in the GUI in the agent card. Click **OK** on the pop-up window to accept the privacy statement by clicking the **proceed to <IP of Windows machine>** link, and then refresh the GUI.

17.5 File Analytics FAQ

Q: Why is the total space for an exported file system on a given file server showing more space compared to the allocated physical storage?

A: This can happen when there are qtree level exports inside the volume.

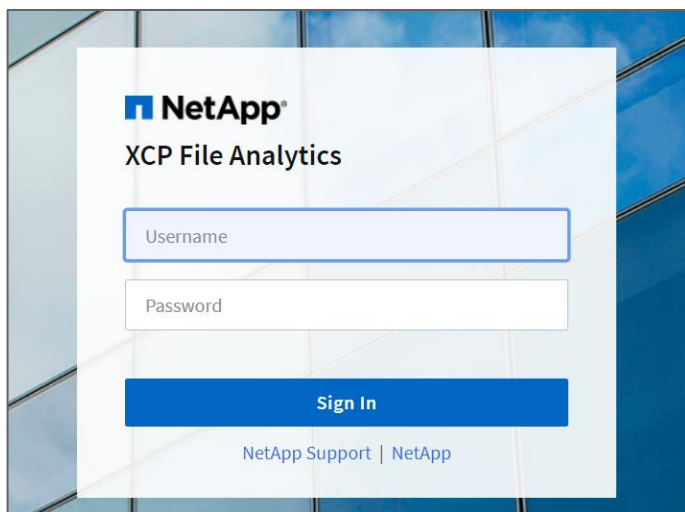
For example, if the volume size is 10GB which is exported as `/vol1` and there is a qtree inside the volume `/vol1/qtreen1`, then the `xcp show` command will show the `vol1` size as 10GB and the `qtreen1` size as 10GB. XCP File Analytics sums up the space of both exports and gives the total space, in this case, 20GB. It does not understand that `qtreen1` is a logical space.

18 XCP File Analytics GUI

NetApp XCP File Analytics GUI provides a dashboard with graphs for visualizing File Analytics. The XCP File Analytics GUI is enabled when you configure XCP on a Linux machine.

18.1 Accessing the XCP File Analytics GUI

1. Use the link `https://<IP address of linux machine>/xcp` to access the File Analytics GUI. When prompted, accept the security certificate:
 - a) Click **Advanced** below the privacy statement.
 - b) Click the **proceed to <IP address of linux machine>** link.
2. Log into the GUI using the username “admin” and the password you set during configuration.



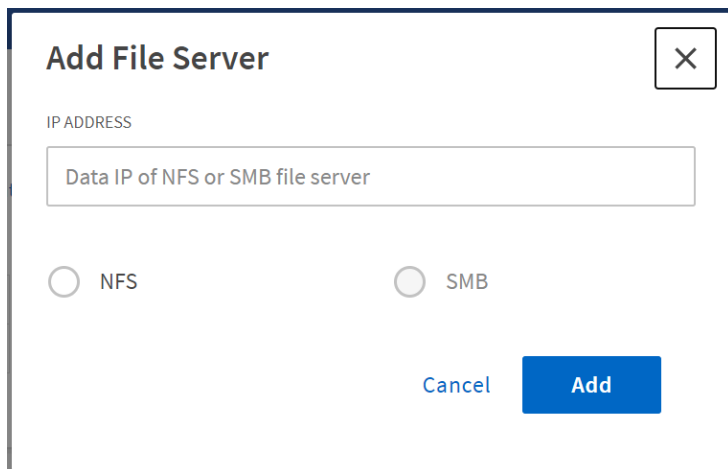
3. On login you can see that the NFS agent is added: a green tick is present showing minimal system configuration of the Linux system and XCP version.
4. If you have configured a SMB agent, you can see the SMB agent added in the same agent card.

18.2 Adding File Servers

You can configure NFS and SMB exported file systems in the XCP File Analytics GUI. This enables XCP File Analytics to scan and analyze data on the filesystem. Use the following steps to add NFS or SMB file servers.

1. To add file servers click the “Add File Server” icon.

[+ Add File Server](#)



Add File Server

IP ADDRESS

Data IP of NFS or SMB file server

☐ NFS ☐ SMB

Cancel Add

2. Add the file server IP address, select the NFS or SMB option and click “Add”.

Note: If an SMB agent is not visible in the GUI, you will not be able to add SMB server.

3. After adding the file server XCP displays:

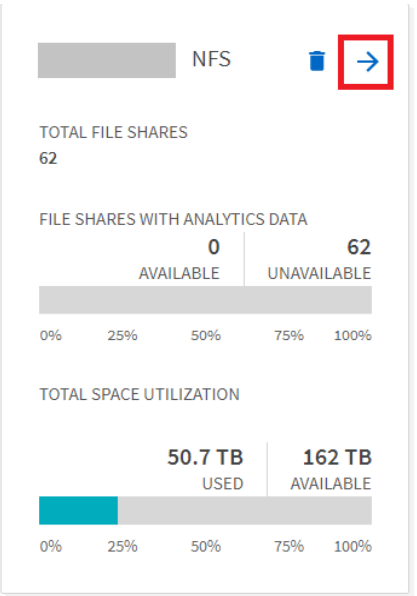
- Total file shares available
- File shares with analytics data
(The initial count is “0”, this updates when you run a successful scan)
- Total space utilization – the sum of space utilized by all the exports
- The data for file shares and space utilization is real-time data direct from the NFS/SMB server. Collecting and processing the data takes several seconds.

Note: Space available vs. space used in File Analytics is calculated from each exported file system available over NFS. For example, if the volumes consist of qtrees and the exports are created over a qtree, the overall space is the cumulative space of the volume size and the qtree size.

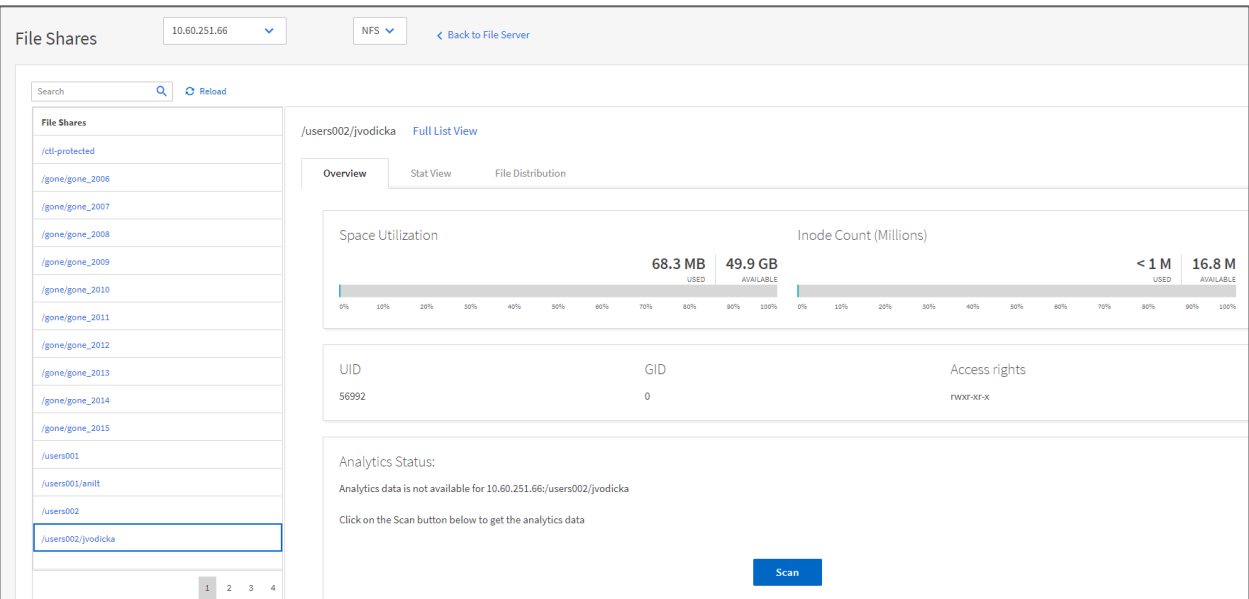
18.3 Running a Scan

When the NFS/SMB files system is added to the XCP File Analytics GUI, you can start a file system scan to analyze and represent the data.

1. Click the arrow on the added file server card to view the file shares on the file server.



2. From the list of file shares, click the name of the file share to scan.
3. Click **Scan** to start the scan.
4. XCP displays a progress bar for the scan. On completion:
- The “stat view” and “file distribution” tabs are enabled to allow you to view graphs.

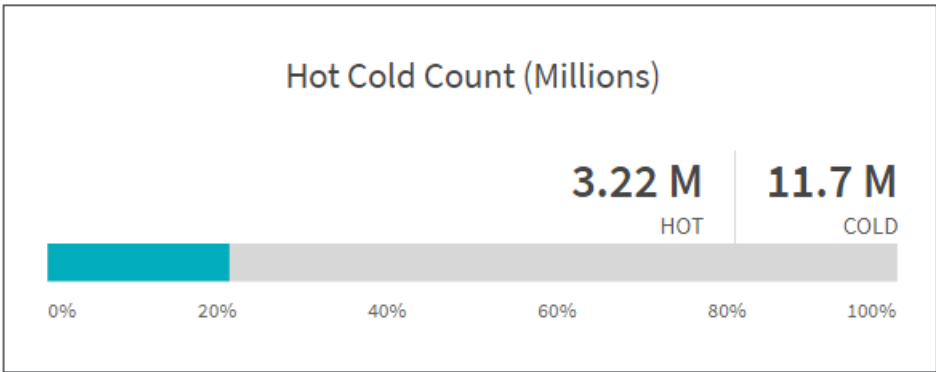


18.4 Understanding Graphs

The File Analytics GUI dashboard displays multiple graphs for visualizing File Analytics.

Hot Cold Count Graph

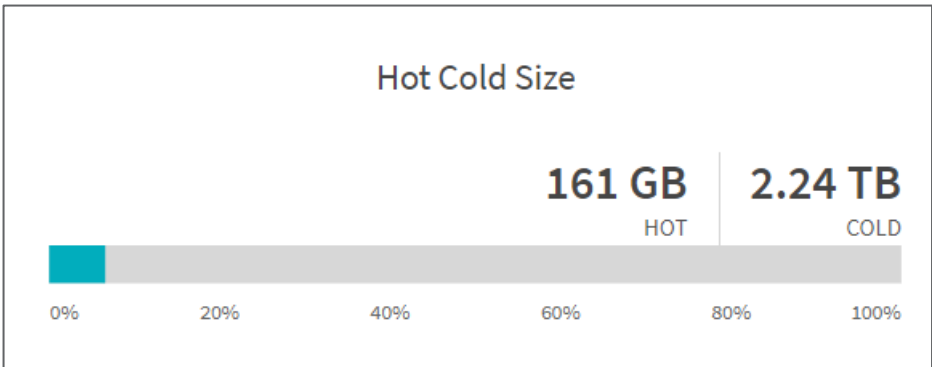
XCP File Analytics categorizes files not accessed for 90 days as cold data. Files accessed in the last 90 days are hot data. Criteria to define hot and cold data is based on access time only.



The Hot Cold Count graph displays the number of inodes (in millions) that are hot or cold in XCP NFS. In XCP SMB, this graph denotes the number of files that are hot or cold.

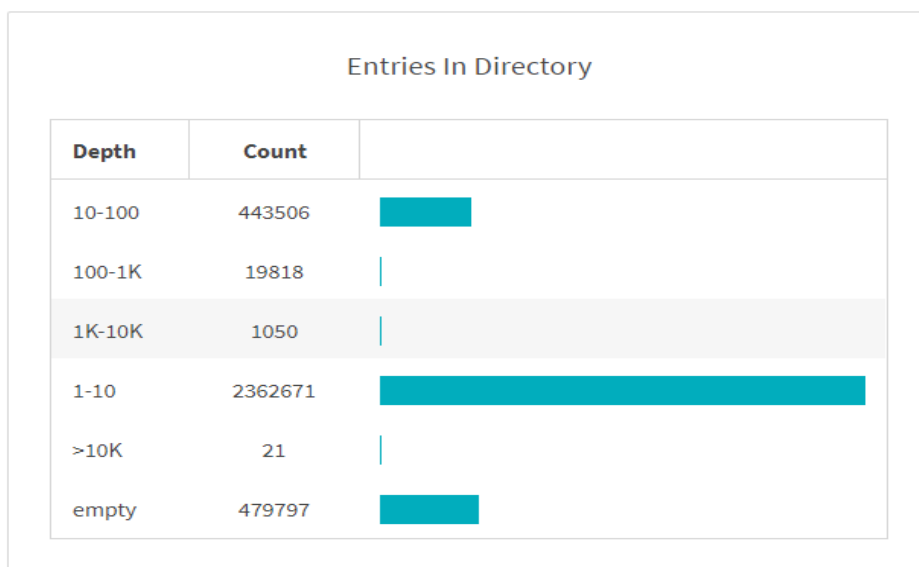
The colored bar represents the hot data and shows the percentage of files accessed within 90 days

Hot Cold Size Graph



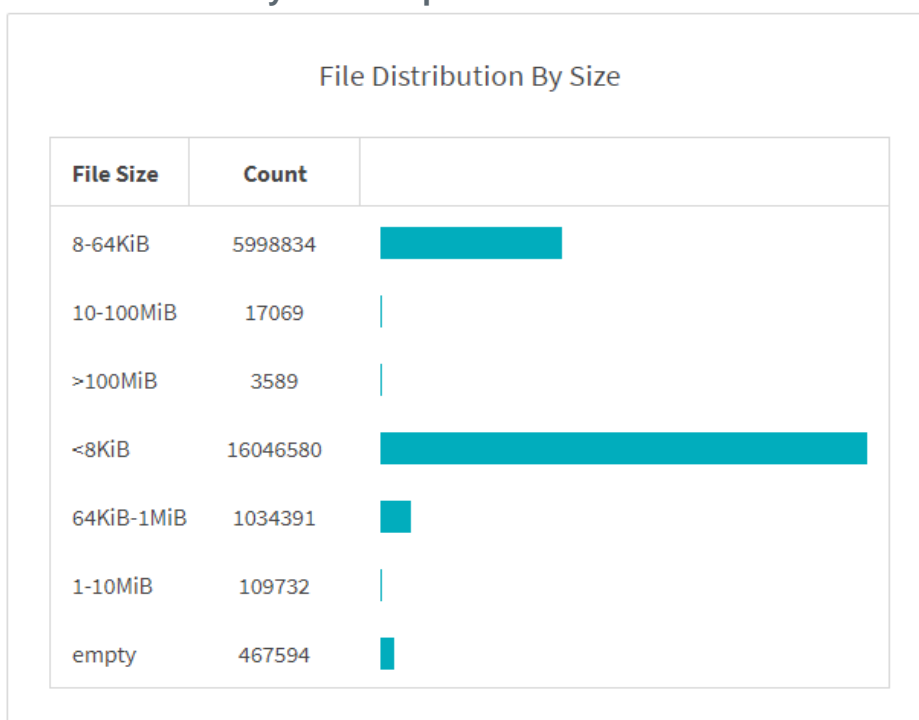
The Hot Cold Size graph displays the percentage of files that are hot and cold and the total size of the files in each category. The colored bar represents the hot data and the uncolored part represents the cold data. Criteria to define hot and cold data is based on access time only.

Entries in Directory Graph



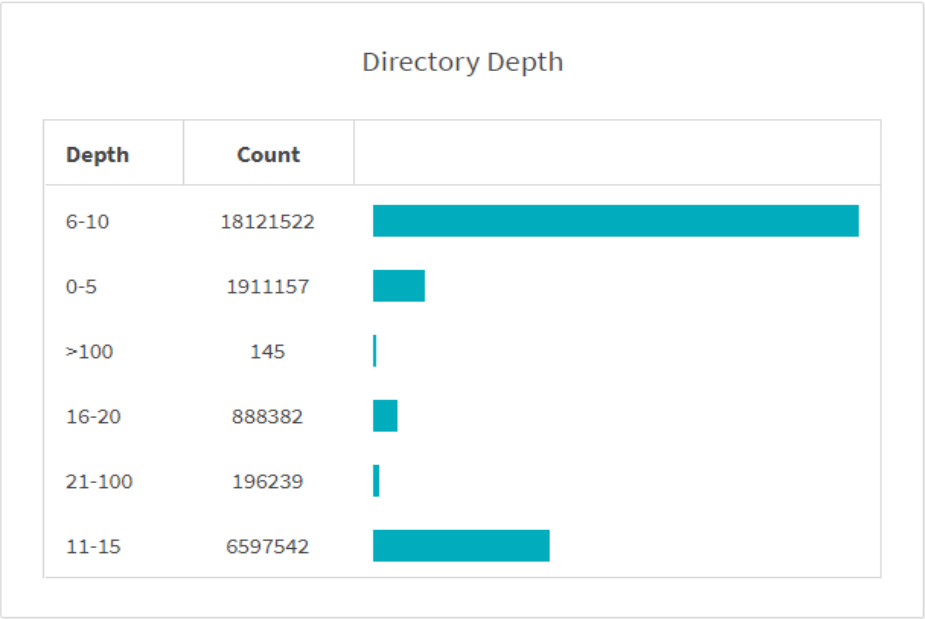
The Entries in Directories graph displays the number of entries in directories. The Depth column contains different directory sizes and the Count column indicates the number of entries in each directory depth.

File Distribution by Size Graph



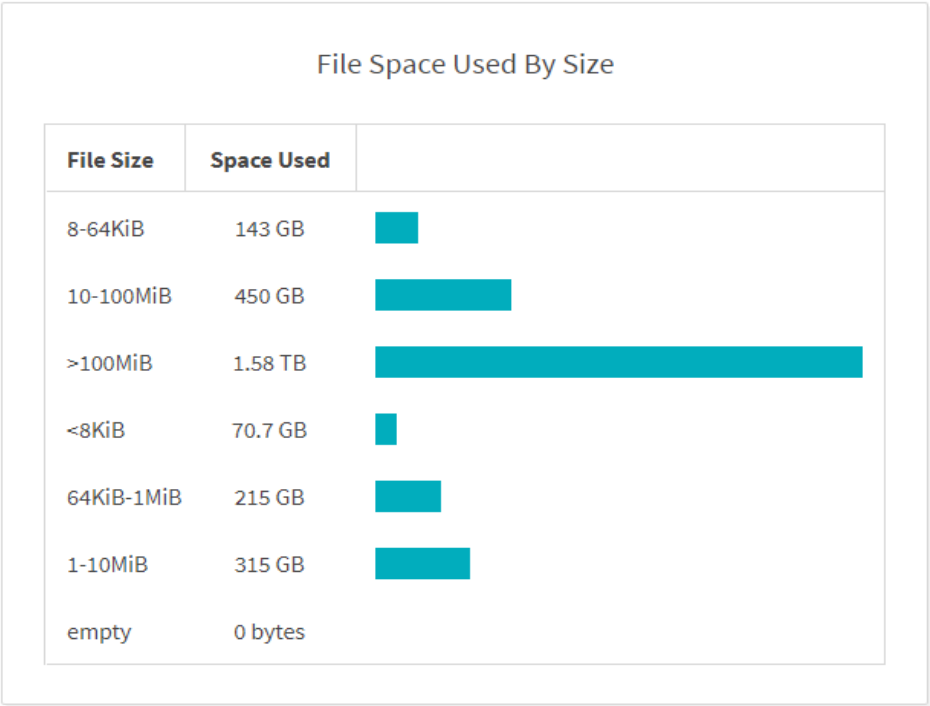
The File Distribution by size graph displays the number of files that are under the given file sizes. The File Size column contains the categories of file size and the Count column indicates the distribution of the number of files.

Directory Depth Graph



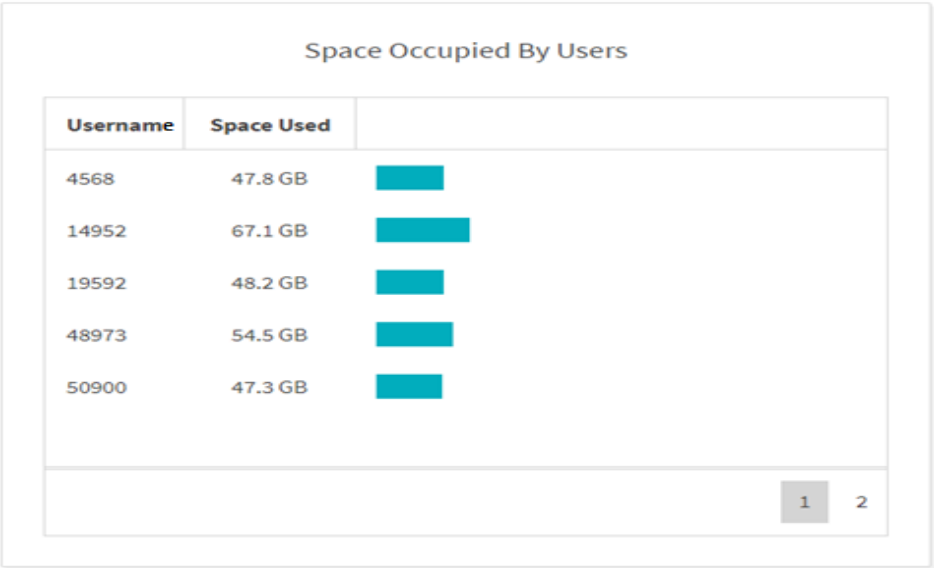
The Directory Depth graph represents the distribution of the number of directories in various directory depth ranges. The Depth column contains various directory depths and the Count column contains the count of each directory depth in the file share.

.File Space Used by Size Graph



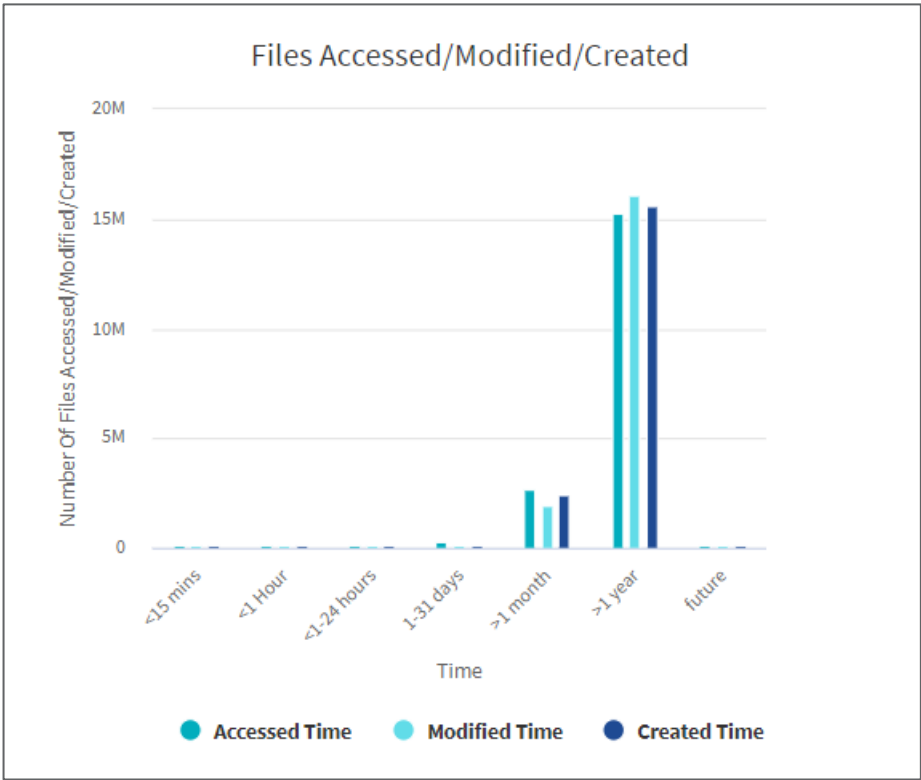
The File Space Used by size graph displays the number of files in different file-size ranges. The File Size column contains different file size ranges and the Space Used column indicates the space used by each file size range.

Space Occupied by Users Graph



The Space Occupied by User graph displays the space used by users. The Username column contains the names of users (UID when usernames cannot be retrieved) and the Space Used column indicates the space used by each username.

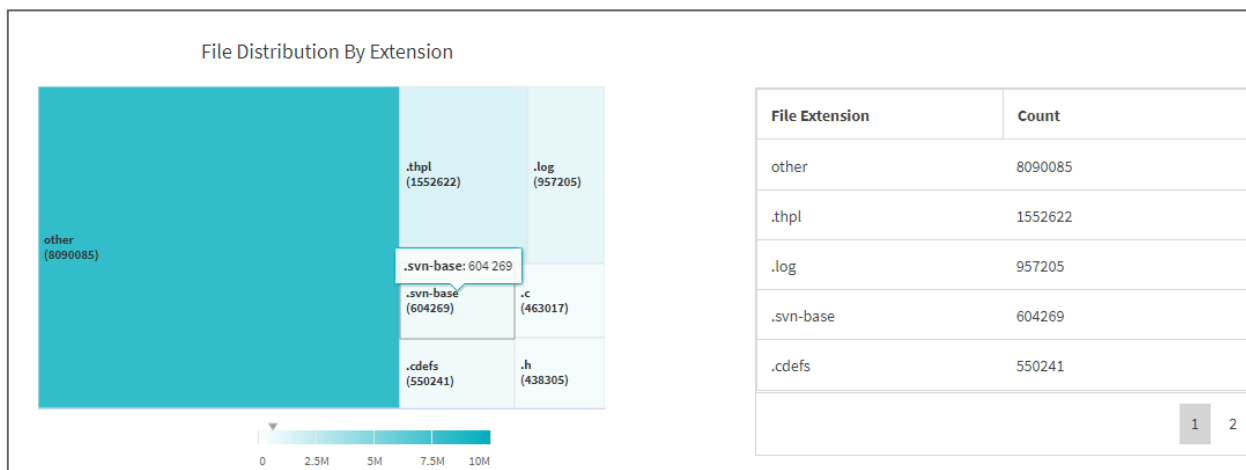
Files Accessed/Modified/Created Graph



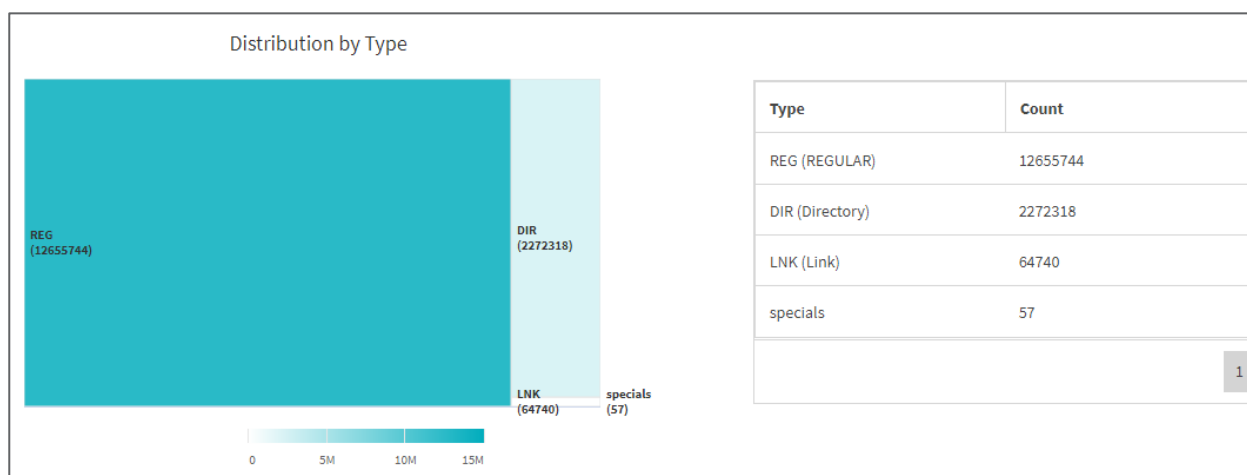
The Files Accessed/Modified/Created graph displays the count of files changed overtime. The X-axis represents the period of time within which changes were made and the y- axis represents the number of files changed.

Note: To get the access time (atime) graph in SMB scans, check the box for preserving atime.

File Distribution by Extension Graph



The File Distribution by Extension graph represents the count of the different file extensions in a file share. The size of the divisions representing the extensions is based on the number of files with each extension.



File Distribution by Type Graph

The “Distribution by Type” graph represents the count of following types of files:

- REG: Regular files
- LNK: Files with links
- Specials: Files with device files and character files.
- DIR: Files with directories
- Junction: this type is available in SMB only.

18.5 Graph Availability for NFS and SMB

Table 10) Graph Availability for NFS and SMB.

| Graph | NFS | SMB |
|---------------------------|-----|-----|
| Hot Cold Count (Millions) | ✓ | ✓ |
| Hot Cold Size | ✓ | ✓ |

| Graph | NFS | SMB |
|---------------------------------|-----|-----|
| File Space Used by Size | ✓ | ✓ |
| File Distribution Used by Size | ✓ | ✓ |
| Directory Depth | ✓ | ✓ |
| Entries in Directory | ✓ | ✓ |
| Files Accessed/Modified/Created | ✓ | ✓* |
| Space Occupied by Users | ✓ | X |
| File Distribution by Extension | ✓ | ✓ |
| Distribution by Type | ✓ | ✓ |

*|To get Access time in XCP SMB, check the box for preserving atime before running a scan.

19 Appendices

19.1 Sample XCP NFS Reports

XCP is a powerful tool. This tool can generate .csv and .html reports for NFS only, for scoping migration projects. Sample .html and .csv reports are shown below.

10.63.5.56:/vol/ex_s01 - report



Command scan 10.63.5.56:/vol/ex_s01

Options '-stats': True

Unreadable directories None Unreadable files None

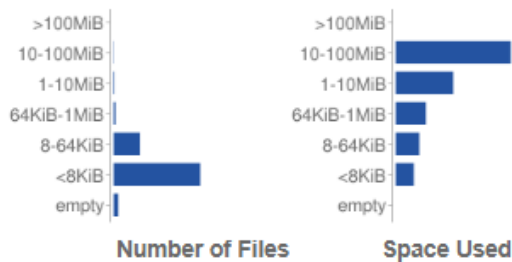
Filters: Unmatched None

Summary 6,034 scanned, 1.36 MiB in (2.15 MiB/s), 140 KiB out (221 KiB/s), 0s.

| | Count | Used | | Avg | Max |
|----------------|-------|----------|-------------------|----------|----------|
| All File Types | 6,034 | 213 MiB | Name Length | 11 | 39 |
| Regular Files | 4,488 | 209 MiB | File Size | 51.5 KiB | 10.5 MiB |
| Directories | 971 | 3.81 MiB | Directory Entries | 6 | 198 |
| Symlinks | 354 | 12 KiB | File Depth | 5 | 10 |
| Specials | None | 0 | | | |

daemon 9
root 891
20041 5,134

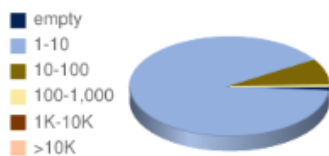
Top 5 File Owners



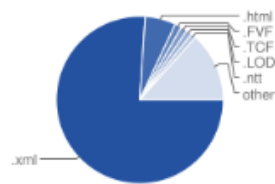
daemon 36 KiB
root 80.1 MiB
20041 132 MiB

Top 5 Space Users

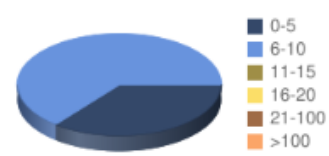
Dedupe Estimate N/A Zero Blocks N/A Hard Links 36.2 MiB Extensions 47 Groups 3 Users 3



Directory Entries



Extension Types



File Depth



11-Jan-2019 04:23 AM EST

Copyright © 2019 NetApp

xcp 1.4-17914d6

19.2 Troubleshooting XCP NFS Errors for CLI

| XCP Error | Cause | Solution |
|--------------------------------------|--|--|
| -bash: ./xcp: Permission denied | | Modify permissions using the <code>chmod 755</code> command. |
| xcp: ERROR: This license has expired | This error occurs if the free 90-day XCP | Renew or obtain the new XCP license from http://xcp.netapp.com . |

| XCP Error | Cause | Solution |
|---|---|--|
| | evaluation license expired. | |
| This copy is not licensed | XCP license is not activated. | Obtain the appropriate XCP license file. Copy the XCP license to the <code>/opt/NetApp/xFiles/xcp/</code> directory on the XCP server. Run the <code>xcp activate</code> command to activate the license. |
| xcp: ERROR: XCP not activated, run 'activate' first | XCP license is not activated. | Download the XCP license from http://xcp.netapp.com . Copy the file on the XCP Linux client host at <code>/opt/NetApp/xFiles/xcp/</code> on the XCP server. Run the <code>xcp activate</code> command to activate the license. |
| xcp: ERROR: License file <code>/opt/NetApp/xFiles/xcp/license</code> not found | License file not found at <code>/opt/NetApp/xFiles/xcp/license</code> . | Register for the XCP license at http://xcp.netapp.com . Download and copy the license file to <code>/opt/NetApp/xFiles/xcp/license</code> on the XCP Linux client host. |
| xcp: ERROR: Failed to activate license: Server unreachable | | |
| xcp usage error: show: requires at least one server | Incomplete parameter specified for the <code>xcp show</code> command. | Rerun the command with server name or IP address specified. Correct syntax <code>./xcp show abc.nfsserver.com</code> . |
| xcp: ERROR: show '10.61.73.94:/vol/nfsvol1': invalid hostname | Valid host name was not specified for the <code>xcp show</code> command. | Run the <code>./xcp show</code> command with the valid host name. Exact command syntax <code>./xcp show 10.61.73.94</code> or <code>./xcp show localhost</code> . |
| xcp usage error: scan: missing source path | Incomplete parameters specified for the <code>xcp scan</code> command. | To resolve this error, run the <code>xcp scan</code> command with the complete source NFSv3 export path. Correct syntax <code>xcp scan <source NFS export path></code> . |
| xcp usage error: scan: invalid path '10.61.73.94' | Incomplete parameter specified for the <code>xcp scan</code> command. | Run the same command again by specifying the complete NFSv3 source export path. |
| xcp: ERROR: Catalog inaccessible: Cannot mount <code>nfs_server:/export[:subdirectory]</code> | Catalog path is not specified in the <code>xcp.ini</code> configuration file. | Open the editor on the XCP Linux client host and update the configuration file with the proper catalog location. The XCP config file is located at <code>/opt/NetApp/xFiles/xcp/xcp.ini</code> . Sample entries of config file. <pre>[root@localhost linux]# cat /opt/NetApp/xFiles/xcp/xcp.ini # Sample xcp config [xcp] catalog = 10.61.73.94:/vol/nfsvol1</pre> |
| xcp: compare1 'n.txt': ERROR: nfs3 LOOKUP 'n.txt' in | Verify operation did not find the source | Run the <code>xcp sync</code> command to copy the incremental updates from source to destination. |

| XCP Error | Cause | Solution |
|---|--|---|
| '10.61.73.113:/target': nfs3 error 2: no such file or directory | file(s) on the target NFS export. | |
| xcp: ERROR: Failed to open catalog id '3': nfs3 LOOKUP '3' in '10.61.73.94:/vol/nfsvol1/catalog/indexes': nfs3 error 2: no such file or directory | XCP could not locate the specified catalog index number. | Verify the index number of the previous operation. To determine the exact catalog path, run the <code>cat /opt/NetApp/xFiles/xcp/xcp.ini</code> command. Catalog indexes are located in the <code><catalog path>:/catalog/indexes</code> directory. After locating the index number, run the same command again by specifying the correct index number or name. |
| xcp: ERROR: Empty or invalid index '10.61.73.94:/vol/nfsvol1/catalog/indexes/2/2.index' | Previous copy operation was interrupted before indexing the files. | Run the <code>xcp copy</code> operation again by specifying the <code>-newid</code> option. Interrupt the <code>copy</code> operation when you see the message "indexed on console session." 88,126 scanned, 42,058 copied, 41,469 indexed, 150MiB in (3.60 MiBps), 41.9MiB out (2.88MiBps), 16s |
| xcp: ERROR: compare batches: child process failed (exit code -9): recv <type 'exceptions.EOFError'>: | Insufficient memory available. | Please follow the instructions in the following KB article: Cannot allocate memory when syncing NFS data |
| xcp: ERROR: For xcp to process ACLs, please mount 10.63.5.56:/vol1 using the OS nfs4 client | Source/target is not mounted on XCP host properly. | Mount the source/target on xcp host. |
| Cannot allocate memory or any other memory related error | Insufficient memory available. | Please follow the instructions in the following KB article: Cannot allocate memory when syncing NFS data |

19.3 Troubleshooting XCP SMB Errors for CLI

| XCP Error | Cause | Solution |
|--|--|--|
| xcp: ERROR: This license has expired | This error occurs if the free 90-day XCP evaluation license expired. | Renew or obtain the new XCP license from http://xcp.netapp.com . |
| This copy is not licensed | XCP license is not activated. | Obtain the appropriate XCP license file. Copy the XCP license to the <code>c:\netapp\xcp</code> folder on the XCP host. Run the <code>xcp activate</code> command to activate the license. |
| xcp: ERROR: XCP not activated, run 'activate' first | XCP license is not activated. | Download the XCP license from http://xcp.netapp.com . Copy the file on the XCP Linux client host at <code>c:\netapp\xcp</code> on the XCP host. Run the <code>xcp activate</code> command to activate the license. |
| xcp: ERROR: License file C:\NetApp\XCP\license not found | License file not found at C:\NetApp\XCP\license. | Register for the XCP license at http://xcp.netapp.com . Download and copy the license file to <code>C:\NetApp\XCP\</code> on the XCP Windows client host. |

| XCP Error | Cause | Solution |
|---|---|--|
| xcp show: error: the following arguments are required: source | Incomplete parameter specified for the xcp show command. | Rerun the command with server name or IP address specified. Correct syntax: /xcp show \\server-name(ip). |
| Xcp scan Error: The network path was not found: | Incorrect server name or ip address | Rerun the command with correct server name or ip address |
| Xcp scan Error: The network name cannot be found | Incorrect share name | Rerun the command with correct share name |
| Xcp scan Error: The system cannot find the file specified | Missing server name or ip address | Rerun the command with server name/ip address |
| Xcp scan Error: The specified path is invalid | Missing share name | Rerun the command with complete server path |
| Xcp copy Error: ERROR failed to obtain fallback security principal Error message logged in xcp.log file: pywintypes.error: (1722, 'LookupAccountName', 'The RPC server is unavailable.') | Missing destination box entry in hosts files at the xcp host. | Add the destination box in the hosts file (C:\Windows\System32\drivers\etc\hosts). Netapp storage destination box entry should be in below format: <data vserver data interface ip> 1 or more white spaces <cifs server name> |
| Xcp copy: ERROR failed to obtain fallback security principal (Post adding destination box entry in the hosts files) Error messaged logged in xcp.log file: 'No mapping between account names and security IDs was done' | the fall back user/group does not exist at target system(destination box) or active directory | Rerun the command with correct fall back user/group options. |
| Xcp copy: ERROR failed to obtain fallback security principal (Post adding destination box entry in the hosts files) Error messaged logged in xcp.log file: pywintypes.error: (87, 'LookupAccountName', 'The parameter is incorrect.') | Incorrect parameter for fall back user/group option | Rerun the command with correct syntax for fall back user/group options. |
| Xcp copy with acl migration Error message logged in xcp.log file: | user is facing issue related to security descriptors, because with privileges that | add your migration user to "Manage audit & security log" policy in your Active Directory. |

| XCP Error | Cause | Solution |
|---|--|--|
| pywintypes.error: (1314, 'GetNamedSecurityInfo', 'A required privilege is not held by the client.') | migrations user owns, XCP can only get owner, group, DACL, but it cannot get SACL. | Reference: https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-r2-and-2012/dn221953(v%3Dws.11) |

19.4 Troubleshooting XCP File Analytics Errors

| Issue | Cause | Solution |
|--|--|---|
| User invokes web page for XCP and enters correct username and password. Login fails. | This might occur when the backend XCP service is not running or because of missing XCP configuration files. | Several issues need to be checked: <ul style="list-style-type: none"> Start the XCP service and try again Start the Database service and try again Reset the DB password. Reset the admin password Use the supported browser, see the XCP File Analytics System Browser section. Check whether the <code>xcp.ini</code> file is present in the <code>/opt/NetApp/xFiles/xcp/</code> location. To reset the <code>xcp.ini</code> file, run the configuration script and select the Repair option. Next, select the menu option to rebuild xcp.ini file. |
| XCP GUI is not showing updated pages. | This might occur due to caching. | Clear the cache and try again. |
| XCP service is not starting. | There might be a service running on a different console on the same machine. | To run the <code>xcp</code> service, use the <code>sudo systemctl start xcp</code> command. Alternatively, run the configuration script and select the Repair option to start the services that are stopped. |
| Failed to scan file share | File share/volume might not be readable. | Check manually whether the file share is accessible/readable |
| XCP Listen failed for Windows | <ul style="list-style-type: none"> The <code>xcp.ini</code> file is not correct Certificate is not correct | Run the XCP configuration script to rebuild the <code>xcp.ini</code> file. Ensure the certificate is copied from the Linux host to Windows in the path specified in the SMB configuration section. |
| Could not load file servers | Failure of API in the backend. Missing <code>xcp.ini</code> or license file. | <ul style="list-style-type: none"> Try a page refresh. If problem persists, manually run the <code>xcp show</code> command on the prompt and check whether you can scan the file server. If successful, raise a ticket with NetApp customer support. If unsuccessful, check manually to see if the file server is active. Check whether the <code>xcp.ini</code> file and license files are in the correct location. To reset the <code>xcp.ini</code> file, run the configuration script and select the Repair option. Next, select the menu option to rebuild xcp.ini file. Check the <code>xcpfalogs</code> logs to see if the license needs renewal. |
| Could not get file server details | File server is inactive. | Try pinging the file server manually to check whether file server is active or run the <code>xcp show</code> |

| Issue | Cause | Solution |
|--|--|---|
| | | command on the file server manually. If the file server is active and the XCP File Analytics GUI is unable to fetch the details, raise a ticket with NetApp Customer Support. |
| Could not load agent details | XCP service is not running. | Start XCP service manually by running the <code>sudo systemctl start xcp</code> command. |
| Login page not displayed | HTTPD service not running. | Run the configuration script and select the option to Repair . This will restart all the services that are stopped. |
| XCP File Analytics page is not displayed after system reboot | Services for starting XCP File Analytics might not be running. | Run the configuration script and select the option to Repair . This will restart all the services that are stopped. |

19.5 Event logs for NFS

| Event Id | Event Template | Event example |
|----------|--|--|
| 401 | Mounted on NFS export <mount path> with maximum read block size <read block size> bytes, maximum write block size <write block size> bytes. Mount point has mode value <mode bits> and type : <fattr3 type>. | 2020-07-14 03:53:59,811 - INFO {"Event ID": 401, "Event Category": "Mounting unmounting file system", "Event Type": "Mount file system information", "ExecutionId": 408249379415, "Event Source": "NETAPP-01", "Description": "Mounted on NFS export 10.234.104.250:/test1 with maximum read block size 65536 bytes, maximum write block size 65536 bytes. Mount point has mode value 493 and type : Directory"} |
| 181 | This license is issued to <username> of <company name>, license type is <license type> with <license status> status, license will expire on <expire date> | 2020-07-14 03:53:59,463 - INFO {"Event ID": 181, "Event Category": "Authentication and authorization", "Event Type": "License information", "ExecutionId": 408249379415, "Event Source": "NETAPP-01", "Description": "This license is issued to NetApp User of Network Appliance, Inc, license type is SANDBOX with ACTIVE status, license will expire on Thu Jul 1 00:00:00 2021"} |
| 183 | The license issued to <username> of <company name> will expire in less than one week | 2020-07-14 04:02:55,151 - WARNING {"Event ID": 183, "Event Category": "Authentication and authorisation", "Event Type": "License warning", "ExecutionId": 408249519546, "Event Source": "NETAPP-01", "Description": "The license issued to NetApp User of Network Appliance, Inc will expire in less than one week"} |
| 581 | Catalog path <catalog volume path> to store catalog directory is not accessible. Refer user guide for | 2020-07-14 04:05:00,857 - ERROR {"Event ID": 581, "Event Category": "Catalog and indexing", "Event Type": "Catalog exporting error", "ExecutionId": 408249552351, "Event Source": "NETAPP-01", "Description": "Catalog path 10.234.104.250:/test11 to store catalog |

| Event Id | Event Template | Event example |
|----------|---|--|
| | configuring catalog volume. | directory is not accessible. Refer user guide for configuring catalog volume."} |
| 582 | Failed creating catalog directory in catalog volume path <catalog volume path> | 2020-07-14 04:10:12,895 - ERROR {"Event ID": 582, "Event Category": "Catalog and indexing", "Event Type": "Catalog directory creation error", "ExecutionId": 408249630498, "Event Source": "NETAPP-01", "Description": "Failed creating catalog directory in catalog volume path 10.234.104.250:/cat_vol"} |
| 584 | Error in creating index directory <index id> for <command> | 2020-07-14 04:52:15,918 - ERROR {"Event ID": 584, "Event Category": "Catalog and indexing", "Event Type": "Error in index creation", "ExecutionId": 408250278214, "Event Source": "NETAPP-01", "Description": "Error in creating index directory abc7 for scan"} |
| 586 | Failed to create index <index id> in catalog volume while executing command : <command> | 2020-07-14 04:45:46,275 - ERROR {"Event ID": 586, "Event Category": "Catalog and indexing", "Event Type": "Error in index creation", "ExecutionId": 408250177021, "Event Source": "NETAPP-01", "Description": "Failed to create index abc6 in catalog volume while executing command : scan {-newid: 'abc6'}"} |
| 351 | System resources available while executing xcp command : <command>, are : <CPU info>, <memory info> | 2020-07-14 05:08:35,393 - INFO {"Event ID": 351, "Event Category": "System resource utilization", "Event Type": "Resources available for scan", "ExecutionId": 408250529264, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : scan , are : CPU: count 4, load avg (1/5/15m) 0.0, 0.0, 0.0, System memory (GiB): avail 7.3, total 7.8, free 6.6, buffer 0.1, cache 0.5"} |
| 13 | XCP <command> is running on platform <platform info> for source <source info> | 2020-07-14 05:08:35,478 - INFO {"Event ID": 13, "Event Category": "XCP job status", "Event Type": "Starting xcp scan operation", "ExecutionId": 408250529264, "Event Source": "NETAPP-01", "Description": "XCP command : scan {-newid: 'abc7'} is running on platform Linux-2.6.26-2-amd64-x86_64-with-debian-5.0.10 for source 10.234.104.250:/test1"} |
| 14 | XCP scan completed successfully after scanning <scan item count> items. Source : <source scanned> | 2020-07-14 05:08:35,653 - INFO {"Event ID": 14, "Event Category": "XCP job status", "Event Type": "XCP scan completion", "ExecutionId": 408250529264, "Event Source": "NETAPP-01", "Description": "XCP scan completed successfully after scanning 479 items. Source : 10.234.104.250:/test1"} |

| Event Id | Event Template | Event example |
|----------|--|---|
| 354 | System resources available while executing xcp command : <command>, are : <CPU info>, <memory info> | 2020-07-14 05:15:13,562 - INFO {"Event ID": 354, "Event Category": "System resource utilization", "Event Type": "Resources available for copy", "ExecutionId": 408250596708, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : copy , are : CPU: count 4, load avg (1/5/15m) 0.0, 0.0, 0.0, System memory (GiB): avail 7.3, total 7.8, free 6.6, buffer 0.1, cache 0.5"} |
| 25 | XCP <command> is running on platform <platform info> for source <copy source> and destination <copy destination/target> | 2020-07-14 05:15:13,647 - INFO {"Event ID": 25, "Event Category": "XCP job status", "Event Type": "Starting xcp copy operation", "ExecutionId": 408250596708, "Event Source": "NETAPP-01", "Description": "XCP command : copy {} is running on platform Linux-2.6.26-2-amd64-x86_64-with-debian-5.0.10 for source 10.234.103.126:/source_vol and destination 10.234.104.250:/test1"} |
| 26 | XCP copy completed successfully after scanning <scanned item count> of which <matched item count> are matched and <copied item count> items are copied to the destination. Source : <copy source>, destination : <copy destination/target> | 2020-07-14 05:15:13,885 - INFO {"Event ID": 26, "Event Category": "XCP job status", "Event Type": "XCP copy completion", "ExecutionId": 408250596708, "Event Source": "NETAPP-01", "Description": "XCP copy completed successfully after scanning 3 of which 0 are matched and 2 items are copied to the destination. Source : 10.234.103.126:/source_vol, destination : 10.234.104.250:/test1"} |
| 16 | XCP command : <command> is running on platform <platform info> for source <sync source> and destination {sync destination} | 2020-07-14 06:41:20,145 - INFO {"Event ID": 16, "Event Category": "XCP job status", "Event Type": "Starting xcp sync operation", "ExecutionId": 408251920146, "Event Source": "NETAPP-01", "Description": "XCP command : sync {-id: 'autoname_copy_2020-07-14_06.22.07.233271'} is running on platform Linux-2.6.26-2-amd64-x86_64-with-debian-5.0.10 for source 10.234.104.251:/src_vol and destination 10.234.104.250:/dest_vol"} |
| 352 | System resources available while executing xcp command : <command>, are : <CPU info>, <memory info> | 2020-07-14 06:41:28,728 - INFO {"Event ID": 352, "Event Category": "System resource utilization", "Event Type": "Resource available for sync", "ExecutionId": 408251920146, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : sync {-id: 'autoname_copy_2020-07-14_06.22.07.233271'} , are : CPU: count 4, load avg (1/5/15m) 0.1, |

| Event Id | Event Template | Event example |
|----------|---|---|
| | | 0.0, 0.0, System memory (GiB): avail 7.2, total 7.8, free 6.6, buffer 0.1, cache 0.5"}} |
| 17 | XCP sync is completed. Total scanned <scanned item count>, copied <copied item count>, modification <modification item count>, new file <new file count>, delete item <delete item count>. Command executed : <command> | 2020-07-14 06:41:29,245 - INFO {"Event ID": 17, "Event Category": "XCP job status", "Event Type": "XCP sync completion", "ExecutionId": 408251920146, "Event Source": "NETAPP-01", "Description": "XCP sync is completed. Total scanned 66, copied 0, modification 1, new file 0, delete item 0. Command executed : sync {-id: 'autoname_copy_2020-07-14_06.22.07.233271'}"}} |
| 19 | XCP command : <command> is running on platform for source <verify source> and destination <verify destination> | 2020-07-14 06:54:59,084 - INFO {"Event ID": 19, "Event Category": "XCP job status", "Event Type": "Starting xcp verify operation", "ExecutionId": 408252130477, "Event Source": "NETAPP-01", "Description": "XCP command : verify {} is running on platform Linux-2.6.26-2-amd64-x86_64-with-debian-5.0.10 for source 10.234.104.251:/src_vol and destination 10.234.104.250:/dest_vol"}} |
| 353 | System resources available while executing xcp command : <command> , are : <CUP info>, {memory info} | 2020-07-14 06:54:59,085 - INFO {"Event ID": 353, "Event Category": "System resource utilization", "Event Type": "Resources available for verify", "ExecutionId": 408252130477, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : verify , are : CPU: count 4, load avg (1/5/15m) 0.0, 0.0, 0.0, System memory (GiB): avail 7.3, total 7.8, free 6.6, buffer 0.1, cache 0.5"}} |
| 211 | log file path : <file path> , severity filter level <severity level>, log message sanitization is set as <sanitization value> | 2020-07-14 06:40:59,104 - INFO {"Event ID": 211, "Event Category": "Logging and supportability", "Event Type": "XCP logging information", "ExecutionId": 408251920146, "Event Source": "NETAPP-01", "Description": "Log file path : /opt/NetApp/xFiles/xcp/xcplogs/xcp.log, severity filter level INFO, log message sanitization is set as False"}} |
| 215 | Event file path: <file path>, severity filter level <severity level>, event message sanitization is set as <sanitization value> | 2020-07-14 06:40:59,105 - INFO {"Event ID": 215, "Event Category": "Logging and supportability", "Event Type": "XCP event information", "ExecutionId": 408251920146, "Event Source": "NETAPP-01", "Description": "Event file path : /opt/NetApp/xFiles/xcp/xcplogs/xcp_event.log, severity filter level INFO, log message sanitization is set as False"}} |

| Event Id | Event Template | Event example |
|----------|--|--|
| | | severity filter level INFO, event message sanitization is set as False"} } |
| 54 | Catalog volume is left with no free space please increase the size of catalog volume <catalog volume running out of space> | 2020-07-14 04:10:12,897 - ERROR {"Event ID": 54, "Event Category": "Application failure", "Event Type": "No space left on Catalog volume error", "ExecutionId": 408249630498, "Event Source": "NETAPP-01", "Description": "Catalog volume is left with no free space. Please increase the size of catalog volume 10.234.104.250:/cat_vol"} } |
| 53 | Catalog volume <catalog volume> is left with no free space to store index <index id> while executing <command>. Please increase the size of the catalog volume <catalog volume running out of space> | 2020-07-14 04:52:15,922 - ERROR {"Event ID": 53, "Event Category": "Application failure", "Event Type": "No space left for catalog volume error", "ExecutionId": 408250278214, "Event Source": "NETAPP-01", "Description": "Catalog volume 10.234.104.250:/cat_vol is left with no free space to store index abc7 while executing : scan {-newid: 'abc7'}. Please increase the size of the catalog volume 10.234.104.250:/cat_vol"} } |
| 61 | NFS LIF <LIF IP> is not reachable for path <volume path without IP> while executing <command>. Please check volume is not offline and is reachable. | 2020-07-14 07:38:20,100 - ERROR {"Event ID": 61, "Event Category": "Application failure", "Event Type": "NFS mount has failed", "ExecutionId": 408252799101, "Event Source": "NETAPP-01", "Description": "NFS LIF 10.234.104.250 is not reachable for path /test11 while executing : scan {}. Please check volume is not offline and is reachable"} } |
| 71 | TCP connection could not be established for IP address <IP>. Check network setting and configuration. | 2020-07-14 07:44:44,578 - ERROR {"Event ID": 71, "Event Category": "Application failure", "Event Type": "IP is not active", "ExecutionId": 408252889541, "Event Source": "NETAPP-01", "Description": "TCP connection could not be established to the address 10.234.204.250. Check network setting and configuration."} (UT done) |
| 51 | Target volume is left with no free space while executing : <command>. Please increase the size of target volume <volume running out of space>. | 2020-07-14 07:07:07,286 - ERROR {"Event ID": 51, "Event Category": "Application failure", "Event Type": "No space left on destination error", "ExecutionId": 408252316712, "Event Source": "NETAPP-01", "Description": "Target volume is left with no free space while executing : copy {}. Please increase the size of target volume 10.234.104.250:/cat_vol"} } |
| 76 | Index id {} is already present . Use new index id and | 2020-07-14 09:18:41,441 - ERROR {"Event ID": 76, "Event Category": "Application failure", "Event Type": "Index ID problem", "ExecutionId": null, "Event Source": "NETAPP-01", "Description": "Index ID {} is already present. Use new index id and"} } |

| Event Id | Event Template | Event example |
|----------|--|---|
| | rerun command : <command> | 01", "Description": "Index id asd is already present . Use new index id and rerun command : scan {-newid: 'asd'} " |
| 362 | CPU usage has crossed <percentage CPU used>% | 2020-06-16 00:17:28,294 - ERROR {"Event ID": 362, "Event Category": "System resource utilization", "Event Type": "resources available for xcp", "Event Source": "NETAPP-01 ", "Description": "CPU Usage has crossed 90.07%"} |
| 363 | Memory Usage has crossed <percentage memory used>% | 2020-06-16 00:17:28,300 - ERROR {"Event ID": 363, "Event Category": "System resource utilization", "Event Type": "resources available for xcp", "Event Source": "NETAPP-01", "Description": "Memory Usage has crossed 95%"} |
| 22 | XCP <command> is running on platform <platform information> for source <resume source> and destination <resume destination> | 2020-07-14 06:24:26,768 - INFO {"Event ID": 22, "Event Category": "XCP job status", "Event Type": "Starting xcp resume operation", "ExecutionId": 408251663404, "Event Source": "NETAPP-01", "Description": "XCP command : resume {-id: 'autaname_copy_2020-07-14_06.22.07.233271'} is running on platform Linux-2.6.26-2-amd64-x86_64-with-debian-5.0.10 for source 10.234.104.251:/src_vol and destination 10.234.104.250:/dest_vol"} |
| 356 | System resources available while executing xcp command : <command> , are : <CPU info>, <memory information> | 2020-07-14 06:24:26,837 - INFO {"Event ID": 356, "Event Category": "System resource utilization", "Event Type": "Resource available for resume", "ExecutionId": 408251663404, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : resume {-id: 'autaname_copy_2020-07-14_06.22.07.233271'} , are : CPU: count 4, load avg (1/5/15m) 0.1, 0.1, 0.0, System memory (GiB): avail 7.2, total 7.8, free 6.6, buffer 0.1, cache 0.5"} |
| 23 | XCP resume is completed. Total scanned items <scanned item count>, total copied items <copied item count>. Command executed : <command> | 2020-07-14 06:26:15,608 - INFO {"Event ID": 23, "Event Category": "XCP job status", "Event Type": "XCP resume completion", "ExecutionId": 408251663404, "Event Source": "NETAPP-01", "Description": "XCP resume is completed. Total scanned items 5982, total copied items 5973. Command executed : resume {-id: 'autaname_copy_2020-07-14_06.22.07.233271'} "} |
| 76 | "Index id <index id> is already present. Use new index id and | 2020-07-14 09:43:08,381 - ERROR {"Event ID": 76, "Event Category": "Application failure", "Event Type": "Index ID problem", "ExecutionId": null, "Event Source": "NETAPP- |

| Event Id | Event Template | Event example |
|----------|---|--|
| | rerun command : <command> | 01", "Description": "Index id asd is already present . Use new index id and rerun command : scan {-newid: 'asd'} "} |
| 82 | Index id <index id> used while executing sync is incomplete. Try resume on the existing index id <index id> | 2020-07-14 10:33:09,307 - ERROR {"Event ID": 82, "Event Category": "Application failure", "Event Type": "Incomplete index used for sync", "ExecutionId": null, "Event Source": "NETAPP-01", "Description": "Index id autaname_copy_2020-07-14_10.28.22.323897 used while executing sync is incomplete. Try resume on the existing index id autaname_copy_2020-07-14_10.28.22.323897."} |
| 365 | CPU utilization reduced to <CPU percentage used>% | 2020-07-14 09:43:08,381 - ERROR {"Event ID": 364, "Event Category": "System resource utilization", "Event Type": "Resources available for xcp", "ExecutionId": 408251663404, "Event Source": "NETAPP-01", "Description": " CPU utilization reduced to 26%} |
| 364 | Memory utilization reduced to <CPU percentage used>% | 2020-07-14 09:43:08,381 - INFO {"Event ID": 364, "Event Category": " Resources available for xcp", "Event Type": "Resources available for xcp", "ExecutionId": 408351663478, "Event Source": "NETAPP-01", "Description": " Memory utilization reduced to 16.2%"}} |
| 10 | XCP command <command> has failed | 2020-07-14 09:43:08,381 - INFO {"Event ID": 10, "Event Category": " Xcp job status", "Event Type": "XCP command failure", "ExecutionId":4082516634506, "Event Source": "NETAPP-01", "Description": " XCP command verify has failed" |

19.6 Event log for SMB

| Event Id | Event Template | Event example |
|----------|---|---|
| 355 | CPU usage has crossed <CPU percentage use>% | 2020-06-23 12:42:02,705 - INFO {"Event ID": 355, "Event Category": "System resource utilization", "Event Type": "CPU usage for xcp", "Event Source": "NETAPP-01", "Description": "CPU usage has crossed 96%"}} |
| 356 | Memory usage has crossed <memory percentage use>% | 2020-06-23 12:42:02,705 - INFO {"Event ID": 356, "Event Category": "System resource utilization", "Event Type": "Memory usage for xcp", "Event Source": "NETAPP-01", "Description": "CPU usage has crossed 92.5%"}} |

| Event Id | Event Template | Event example |
|----------|--|---|
| 61 | Address was not found: <complete address over which command is fired> | 2020-07-15 02:57:06,466 - ERROR {"Event ID": 61, "Event Category": "Application Failure", "Event Type": "Address was not found", "ExecutionId": 408264113696, "Event Source": "NETAPP-01", "Description": "Address was not found: \\\"\\\\\\\\10.234.204.253\\\\cifs1\\\""}} |
| 62 | Interface cannot be found: < complete address over which command is fired > | 2020-07-15 02:52:00,603 - ERROR {"Event ID": 62, "Event Category": "Application Failure", "Event Type": "Interface was not found", "ExecutionId": 408264071616, "Event Source": "NETAPP-01", "Description": "Interface cannot be found: \\\"\\\\\\\\10.234.104.253\\\\cifs11\\\""}} |
| 63 | Invalid Address. Please make sure that the Address starts with '\\\' | 2020-07-15 03:00:10,422 - ERROR {"Event ID": 63, "Event Category": "Application Failure", "Event Type": "Invalid Address", "ExecutionId": 408264197308, "Event Source": "NETAPP-01", "Description": "Invalid Address. Please make sure that the Address starts with '\\\''"}} |
| 41 | Destination volume is left with no free space please increase the size target volume: <destination volume> | 2020-06-15 17:12:46,413 - ERROR {"Event ID": 41, "Event Category": "Application Failure", "Event Type": "No space left on destination error", "Event Source": "NETAPP-01", "Description": "Destination volume is left with no free space please increase the size of target volume: 10.234.104.253\\\\to"}} |
| 211 | Log file path : <file path>, severity filter level <severity level>, log message sanitization is set as <value of sanitization option> | {"Event ID": 211, "Event Category": "Logging and supportability", "Event Type": "XCP logging information", "ExecutionId": 408252673852, "Event Source": "NETAPP-01", "Description": "Log file path : C:\\NetApp\\XCP\\Logs\\xcp.log, severity filter level DEBUG, log message sanitization is set as False"} |
| 215 | Event file path : <file path>, severity filter level <severity level>, Event message sanitization is set as <sanitization option> | {"Event ID": 215, "Event Category": "Logging and supportability", "Event Type": "XCP event information", "ExecutionId": 408252673852, "Event Source": "NETAPP-01", "Description": "Event file path : C:\\NetApp\\XCP\\Logs\\xcp_event.log, severity filter level INFO, Event message sanitization is set as False"} |
| 181 | This license is issued to <user name> of <company name>, license type is <license type> with <status> status, | {"Event ID": 181, "Event Category": "Authentication and authorization", "Event Type": "license information", "ExecutionId": 408252673852, "Event Source": "NETAPP-01", "Description": "This |

| Event Id | Event Template | Event example |
|----------|---|--|
| | license will expire expires on <expiration date> | license is issued to calin of NetApp Inc, license type is SANDBOX with ACTIVE status, license will expire on Mon Dec 31 00:00:00 2029"} } |
| 13 | XCP <command> is running on platform <platform information> for source <scan source> | 2020-07-15 02:12:56,917 - INFO {"Event ID": 13, "Event Category": "XCP job status", "Event Type": "Starting xcp scan operation", "ExecutionId": 408263470688, "Event Source": "NETAPP-01", "Description": "XCP {scan} is running on platform Windows-8.1-6.3.9600-SP0 for source \\10.234.104.253\\cifs"} |
| 351 | System resources available while command : <command>, are : cpu <CPU information>, total memory <total memory on system>, available memory <available memory for execution> | 2020-07-15 02:12:56,917 - INFO {"Event ID": 351, "Event Category": "System resource utilization", "Event Type": "Resources available for scan", "ExecutionId": 408263470688, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : scan, are : cpu 4, total memory 8.00GiB, available memory 6.81GiB"} |
| 14 | XCP scan completed successfully after scanning <scanned items count> items. Source : <scan source> | 2020-07-15 02:12:57,932 - INFO {"Event ID": 14, "Event Category": "XCP job status", "Event Type": "XCP scan completion", "ExecutionId": 408263470688, "Event Source": "NETAPP-01", "Description": "XCP scan completed successfully after scanning 29 items. Source : \\10.234.104.253\\cifs"} |
| 25 | XCP <command> is running on platform <platform information> for source <copy source> and destination <copy destination> | 2020-07-15 02:19:06,562 - INFO {"Event ID": 25, "Event Category": "XCP job status", "Event Type": "Starting xcp copy operation", "ExecutionId": 408263563552, "Event Source": "NETAPP-01", "Description": "XCP {copy} is running on platform Windows-8.1-6.3.9600-SP0 for source \\10.234.104.253\\cifs and destination \\10.234.81.97\\source_vol"} |
| 352 | System resources available while executing command : <command>, are : cpu <CPU information>, total memory <Total memory>, available memory <memory available for execution> | 2020-07-15 02:19:06,562 - INFO {"Event ID": 352, "Event Category": "System resource utilization", "Event Type": "Resources available for copy", "ExecutionId": 408263563552, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : copy, are : cpu 4, total memory 8.00GiB, available memory 6.82GiB"} |
| 26 | XCP copy completed successfully after | 2020-07-15 02:19:14,500 - INFO {"Event ID": 26, "Event Category": "XCP job status", |

| Event Id | Event Template | Event example |
|----------|--|---|
| | copying <copied items count> items. Source : <copy source>, destination : <copy destination> | "Event Type": "XCP copy completion", "ExecutionId": 408263563552, "Event Source": "NETAPP-01", "Description": "XCP copy completed successfully after copying 0 items. Source : |
| 16 | XCP <command> is running on platform <platform> for source <sync source> and destination <sync destination> | 2020-07-15 02:27:10,490 - INFO {"Event ID": 16, "Event Category": "XCP job status", "Event Type": "Starting xcp sync operation", "ExecutionId": 408263688308, "Event Source": "NETAPP-01", "Description": "XCP {sync} is running on platform Windows-8.1-6.3.9600-SP0 for source \\10.234.104.253\\cifs and destination \\10.234.81.97\\source_vol"} |
| 353 | System resources available for command : <command>, are : cpu <CPU information>, total memory <total memory>, available memory <available memory> | 2020-07-15 02:27:10,490 - INFO {"Event ID": 353, "Event Category": "System resource utilization", "Event Type": "Resources available for sync", "ExecutionId": 408263688308, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : sync, are : cpu 4, total memory 8.00GiB, available memory 6.83GiB"} |
| 17 | XCP sync completed successfully after scanning <scanned item count> items, copying <copied item count> items, comparing <compared item count> items, removing <removed item count> items. Source : <sync source>, destination : <sync destination> | 2020-07-15 03:04:14,269 - INFO {"Event ID": 17, "Event Category": "XCP job status", "Event Type": "XCP sync completion", "ExecutionId": 408264256392, "Event Source": "NETAPP-01", "Description": "XCP sync completed successfully after scanning 30 items, copying 20 items, comparing 30 items, removing 0 items. Source : \\10.234.104.253\\cifs, destination : \\10.234.81.97\\source_vol"} |
| 19 | XCP <command> is running on platform <platform information> for source <verify source> and destination <verify destination> | 2020-07-15 03:14:04,854 - INFO {"Event ID": 19, "Event Category": "XCP job status", "Event Type": "Starting xcp verify operation", "ExecutionId": 408264409944, "Event Source": "NETAPP-01", "Description": "XCP {verify -noacl -noatime} is running on platform Windows-8.1-6.3.9600-SP0 for source \\10.234.104.253\\cifs and destination \\10.234.81.97\\source_vol"} |
| 354 | System resources available for command : <command>, are : cpu <CPU information>, total memory <total memory>, available | 2020-07-15 03:14:04,854 - INFO {"Event ID": 354, "Event Category": "System resource utilization", "Event Type": "Resources available for verify", "ExecutionId": 408264409944, "Event Source": "NETAPP-01", "Description": "System resources available while executing xcp command : verify, are : |

| Event Id | Event Template | Event example |
|----------|---|---|
| | memory <available memory for execution> | cpu 4, total memory 8.00GiB, available memory 6.80GiB"}} |
| 20 | XCP verify is completed by scanning <scanned item count> items, comparing <compared item count> items | {"Event ID": 20, "Event Category": "XCP job status", "Event Type": "XCP verify completion", "command Id": 408227440800, "Event Source": "NETAPP-01", "Description": "XCP verify is completed by scanning 59 items, comparing 0 items"} |
| 357 | CPU utilization reduced to <CPU utilization percentage>% | {"Event ID": 357, "Event Category": "System resource utilization", "Event Type": "CPU usage for xcp", "Event Source": "NETAPP-01", "Description": "CPU utilization reduced to 8.2%"} |
| 358 | Memory utilization reduced to <memory utilization percentage>% | {"Event ID": 358, "Event Category": "System resource utilization", "Event Type": "Memory usage for xcp", "Event Source": "NETAPP-01", "Description": "Memory utilization reduced to 19%"} |
| 10 | XCP command <command> has failed | 2020-07-14 09:43:08,381 - INFO {"Event ID": 10, "Event Category": " Xcp job status", "Event Type": "XCP command failure", "Event Source": "NETAPP-01", "Description": " XCP command H:\\console_msg\\xcp_cifs\\xcp__main__.py verify \\\\10.234.104.253\\cifs \\\\10.234.81.97\\source_vol has failed" |

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