



# **Sizing guidelines**

## **NetApp Solutions**

NetApp  
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# Sizing guidelines

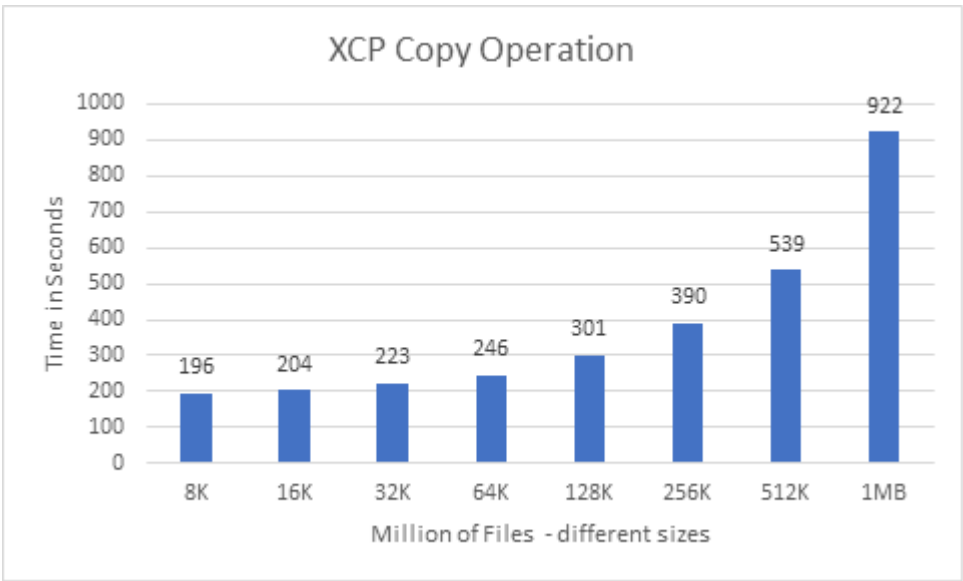
[Previous: Deployment steps.](#)

This section provides the approximate time to perform the XCP copy and XCP sync operations with a different file size of one million files for NFS.

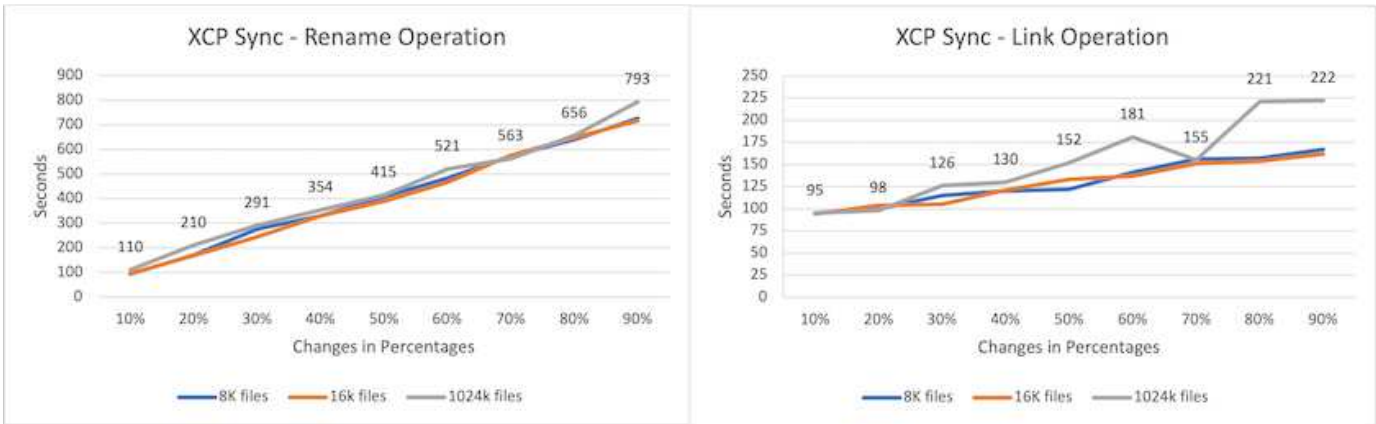
## Time estimate based on testing

The tests for the XCP copy and sync operations used the same test bed that was used for deployment. One million files of three sets of 8K, 16K, and 1MB files were created and the changes were performed in real time. The XCP sync function performed the differential incremental updates from the source to the target at the file level. The incremental update operation is one or more of these four operations: rename existing files and folders, append data to existing files, delete files and folders, and include additional hard, soft, and multilinks. For test purposes, we focused on the rename, append, delete, and links operations. In other words, the modification operations such as rename, append, and delete were performed at a change rate of 10% to 90% on one million files.

The following figure shows the results of the XCP copy operation.



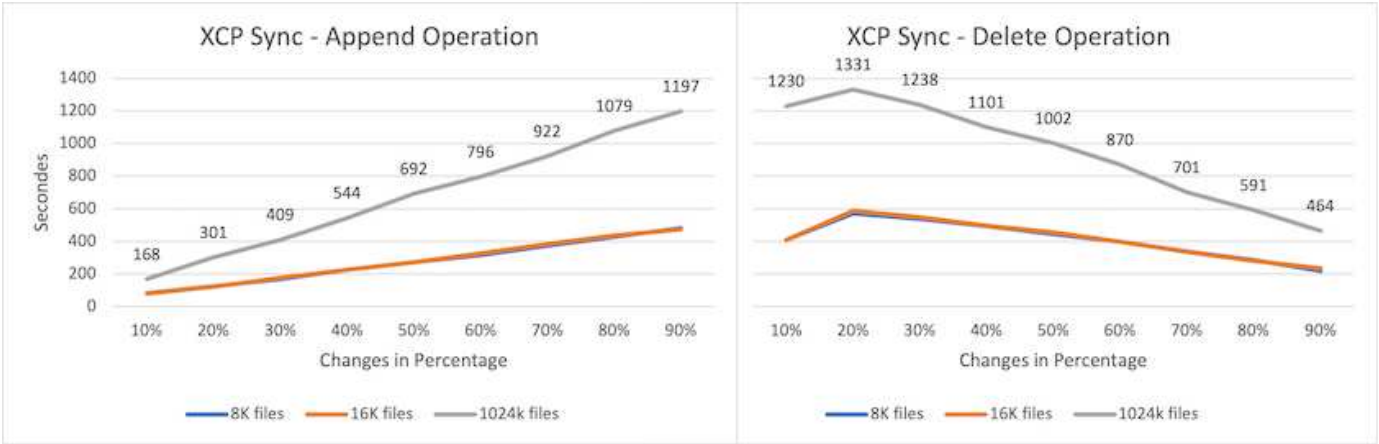
The following figure shows the results of the XCP Sync rename and link operations.



The file size is not propositional to the `xcp sync` completion time for transferring the renamed source files; the graphs are linear.

The link types are soft links, hard links, and multi-links. Soft links are considered normal files. The size of the files is not relevant for the time to complete the XCP sync operation.

The following figures show the results of the XCP sync append and delete operations.

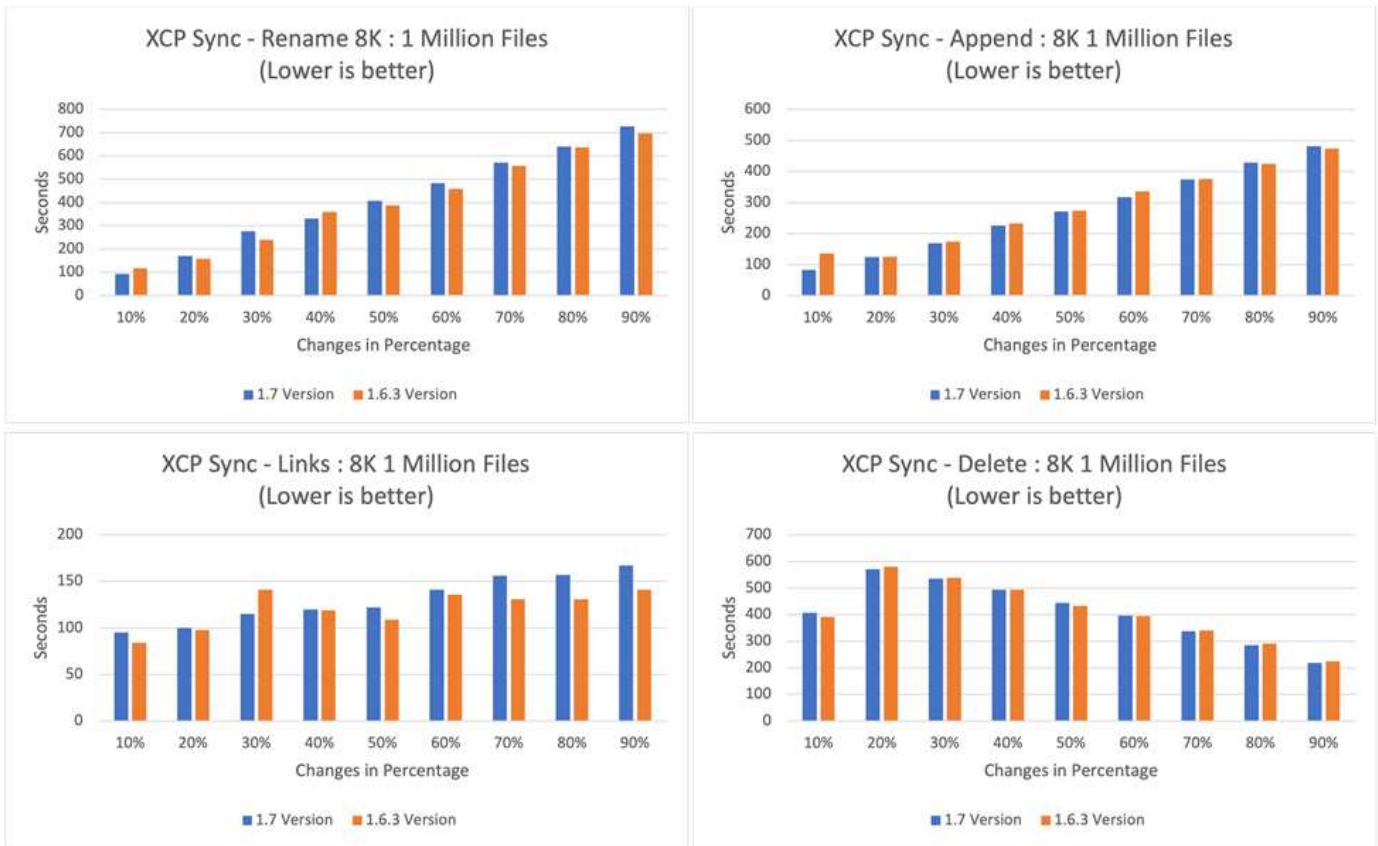


For the append and delete operations, large file sizes take more time compared to small file sizes. The time to complete the operation is linear to the percentage of append and delete changes.

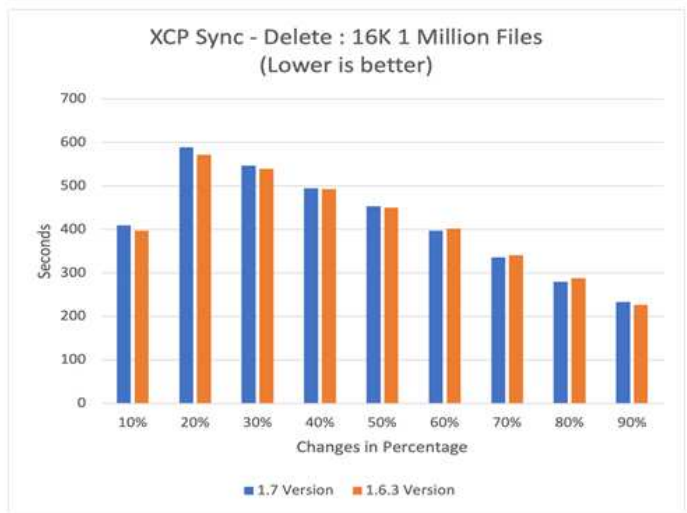
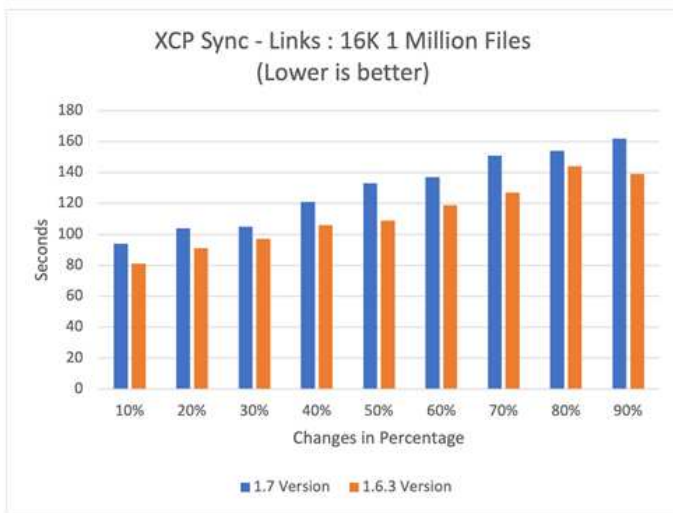
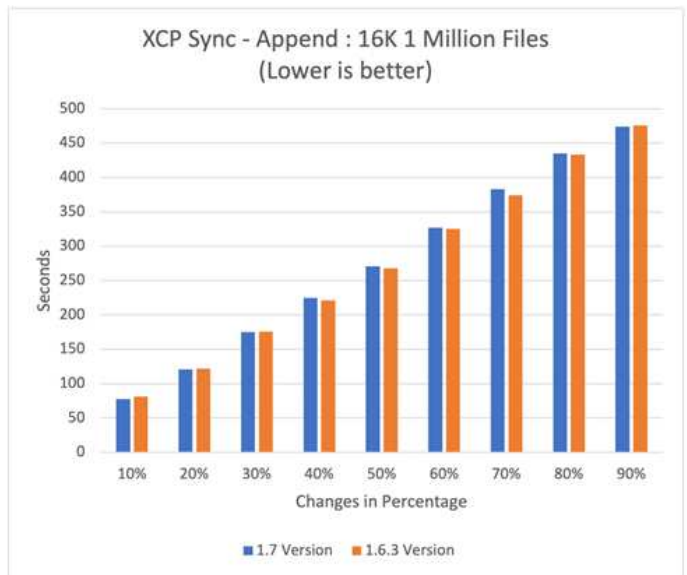
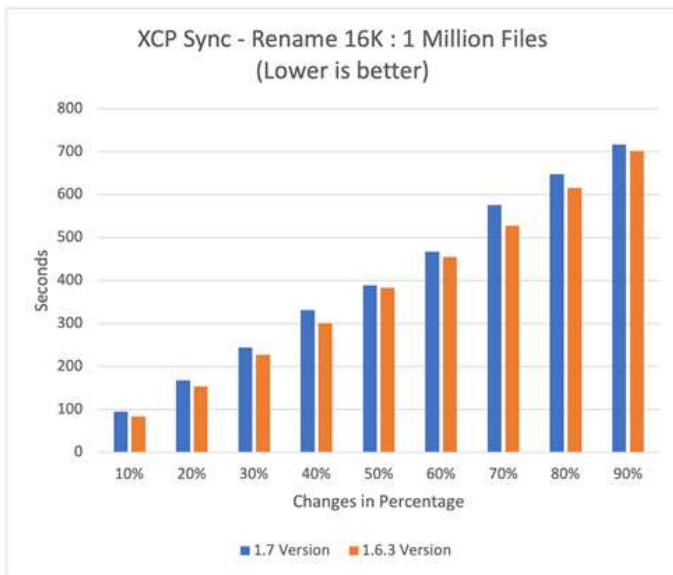
## Comparing XCP 1.6.1 to XCP 1.5

Compared to previous versions, XCP 1.6.3 and 1.7 provides improved performance. The following section shows a sync performance comparison between XCP 1.6.3 and 1.7 for 8K, 16K, and 1MB sizes of one million files.

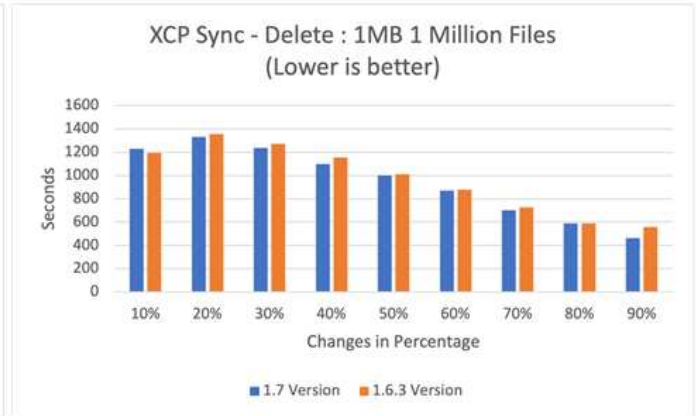
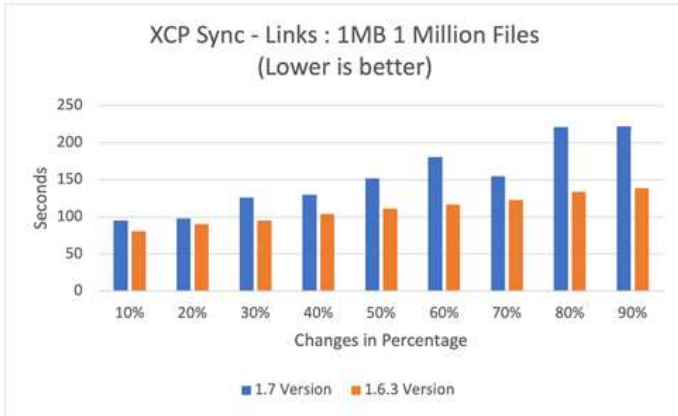
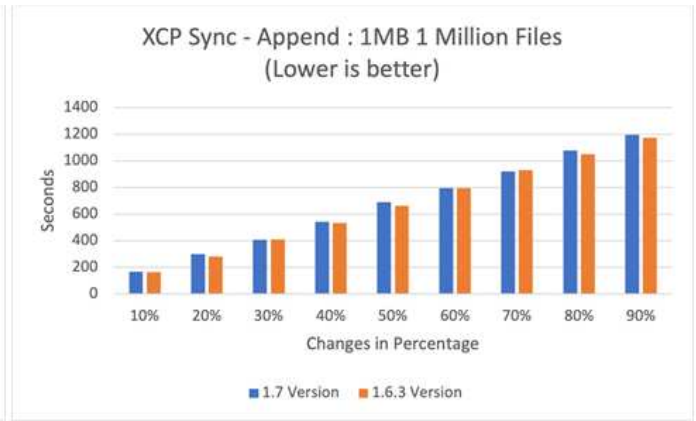
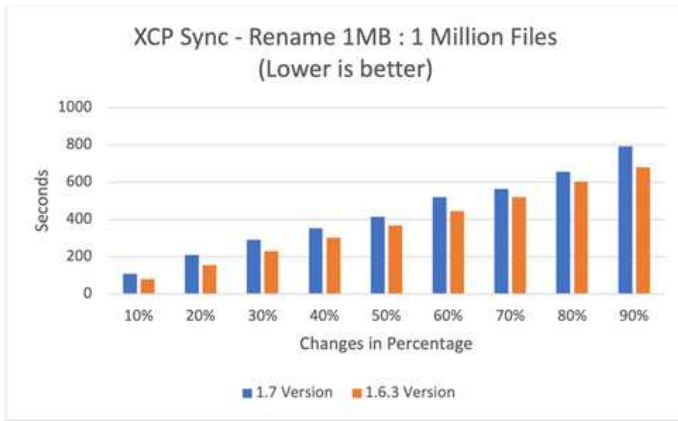
The following figures shows the results of the XCP sync performance for XCP 1.6.3 versus 1.7 (with an 8K size of one million files).



The following figure shows the results of the XCP sync performance for XCP 1.6.1 versus 1.5 (with a 16K size of one million files).



The following figure shows the results of the XCP sync performance for XCP 1.6.1 versus 1.5 with a 1MB size of one million files.



On average, the XCP 1.7 performance improved on or was similar to XCP 1.6.3 for the `xcp sync` differential incremental update—rename, append, link, and delete operations with a 1MB size of one million files.

Based on this performance validation, NetApp recommends using XCP 1.7 for your data migration on-premises and in the cloud.

[Next: Performance tuning.](#)

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