

How to Adjust Performance in Windows

XCubeNXT Series Best Practice

July 2020

OVERVIEW

This document will guide customers how to use the XCubeNXT storage system to adjust performance in Microsoft Windows server. The correct settings will make the application more powerful. The applicable models are XN8024D and XN8016D.

CONFIGURE STORAGE

Before configuring the storage, follow some guidelines to get the best performance.

1. **Disable Memory cache protection:** If you can tolerate a short RPO (Recovery Point Objective), disabling **Memory cache protection** setting will increase IOPS by 2 times and write throughput by up to 5 times. Please go Control Panel -> General Settings -> System, uncheck **Memory cache protection** checkbox, and then click the **Apply** button.



CAUTION

Disabling the **Memory cache protection** function will improve performance, but risk the short tolerance of RPO (Recovery Point Objective). Default is enabled.



TIP

It is recommended to connect a UPS (uninterruptible power supply) or generator to prevent power outages.

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2. **Create two pools:** The XCubeNXT series features Dual-Active controller architecture. Both controllers concurrently provide storage services in real time. Active-Active architecture doubles the available host bandwidth and cache-hit ratio which ensures there is no wasted resource in the system. Therefore, the best practice is to create at least two pools assigned to each controller, and let both controllers work together.
 3. **Create a RAID 50 pool if disks > 8:** If the number of member disks is larger than 8, it is recommended to create a RAID 50 pool for best performance. Otherwise, create a RAID 5 for optimal.

4. **Enable hybrid SSD cache:** Except uses all flash (all SSDs), putting some SSDs in a traditional HDD pool and enabling hybrid SSD cache can improve performance.

Now you have the entire plan to configure storage. The following are the steps to configure storage settings.

1. Follow this video clip - [QSAN NAS Tutorial: NAS Storage Overview and connecting CIFS from Windows](#) to create a pool and a volume.

CONFIGURE iSCSI IN WINDOWS

Make sure that all the IP addresses of the NIC ports to be used for iSCSI connection can ping to the LAN ports on the XCubeNXT system, please consider configuring different network segments for each NIC port and LAN port, this will make it easier to distinguish and troubleshoot afterward. If there are 4 NIC ports on the server side, the example of the configurations are on the following.

- Server1 - NIC1 (192.168.1.1/24) -->> XCubeNXT - CTRL1-LAN1 (192.168.2.1/24)
- Server1 - NIC2 (192.168.2.1/24) -->> XCubeNXT - CTRL2-LAN2 (192.168.2.2/24)
- Server2 - NIC1 (192.168.3.1/24) -->> XCubeNXT - CTRL1-LAN1 (192.168.3.2/24)
- Server2 - NIC2 (192.168.4.1/24) -->> XCubeNXT - CTRL2-LAN2 (192.168.4.2/24)

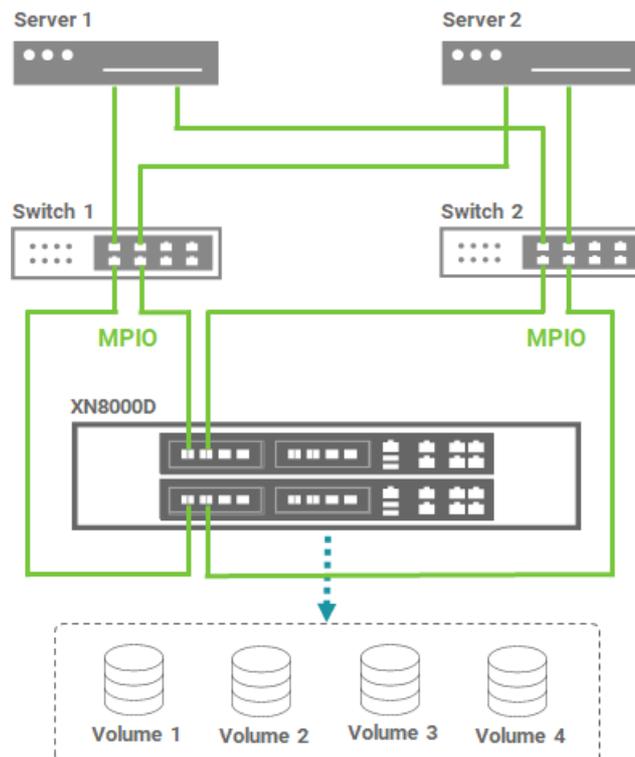


Figure 1 Topology for iSCSI

The following are the steps to configure iSCSI in Microsoft Windows server.

1. Follow this video clip - [Quick Installation setup with XCubeNXT\(Cluster CIFS/NFS, MPIO iSCSI LUN\)](#) to log in to the iSCSI target and configure MPIO from the server side. Remember to reboot the server after the MPIO configuration is complete.
2. If you experience performance degradation when testing performance, try adjusting the following parameters on the HBA driver of the server.
 - Access the **Device Manager** in the **Network Adapter**, right-click the NIC port used for performance testing, select the **Properties**, go to the **Advanced**, find the RSS queue (terms of different brands may vary) , and then adjust the **RSS queue** from 8 to 2.
 - At the same location as above, find the **Receive Buffer** and adjust the value to the maximum.
 - In the same position as above, find the **Transmit Buffers** and adjust the value to the maximum.
 - In the same location as above, find the **Interrupt Moderation Rate** and set its value to **Off**.
 - If the above adjustments do not help, please open a command line and go further the following options.

```
C:\> netsh int tcp set global autotuninglevel = restricted  
  
or  
  
C:\> netsh int tcp set global autotuninglevel = highlyrestricted
```



INFORMATION

After completing the above parameters, you must log in to the connected iSCSI session again. If the server does not seem to work properly after logging in, you must restart the server.



TIP

After making one of the above adjustments, please verify the performance immediately to find out which adjustment items are suitable for you. There is not necessary to adjust each item.

CONFIGURE CIFS IN WINDOWS

For CIFS usage, it has to setup a cluster IP for binding two private IPs. For example:

- ↓ XCubeNXT - CTRL1-LAN1 (10.10.1.21/24)
- Server - NIC1 (192.168.1.1/24) -->> XCubeNXT - Cluster IP1 (192.168.1.2/24)
- ↑ XCubeNXT - CTRL2-LAN1 (10.10.1.22/24)

- ↓ XCubeNXT - CTRL1-LAN2 (10.10.2.21/24)
- Server - NIC2 (192.168.2.1/24) -->> XCubeNXT - Cluster IP2-LAN2 (192.168.2.2/24)
- ↑ XCubeNXT - CTRL2-LAN2 (10.10.2.22/24)

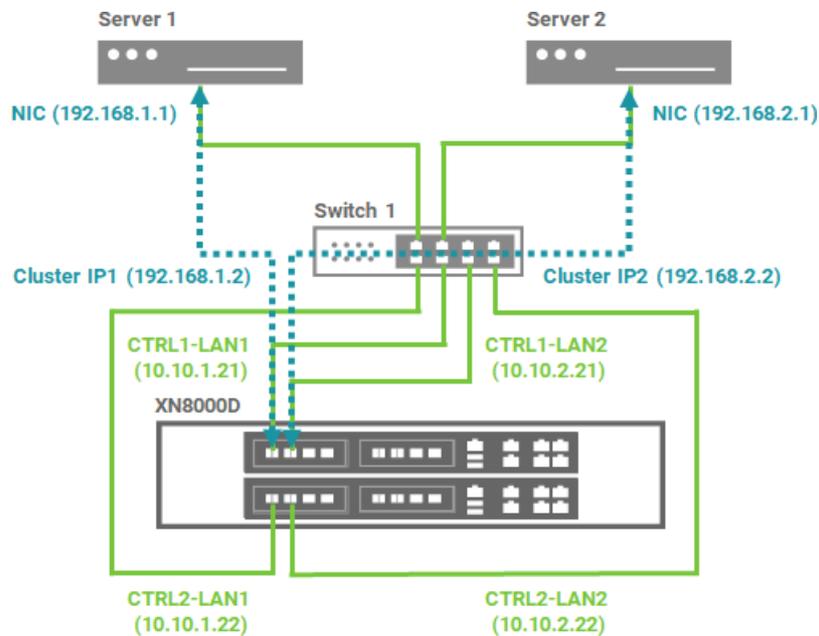


Figure 2 Topology for CIFS



INFORMATION

Cluster IP in dual controller will work once at a time.



INFORMATION

IPv6 does not support cluster IP yet, connect to the private IPv6 directly.
(Jun. 2020)

The following are the steps to configure CIFS in Microsoft Windows server.

1. Follow this video clip - [Quick Installation setup with XCubeNXT\(Cluster CIFS/NFS, MPIO iSCSI LUN\)](#) to configure share folders and complete the login process.
2. If you experience performance degradation when testing performance, please refer to the Section - [Configure iSCSI in Windows](#) and try adjusting the parameters on the HBA driver of the server.

REFERENCES

There are some related materials for references.

Video Clips

- [Quick Installation setup with XCubeNXT\(Cluster CIFS/NFS, MPIO iSCSI LUN\)](#)
- [QSAN NAS Tutorial: NAS Storage Overview and connecting CIFS from Windows](#)
- [QSAN XCubeNAS Tutorial - How to connect iSCSI target from Windows and Unix-Like OS?](#)
- [QSAN SAN Tutorial - Setup Windows iSCSI Initiator with MPIO](#)

Documents

- Best Practice - [iSCSI Performance Tuning](#)
- White Paper - [XCubeNXT Performance Tuning](#)