Best Practices Guide

Nimble Storage Best Practices for Microsoft Windows on Fibre Channel
# Table of Contents

**DOCUMENT REVISION**

**INTRODUCTION**

**PREREQUISITES**

- **HBA UTILITIES**
- **NIMBLE WINDOWS TOOLKIT**

**INSTALLATION**

- **HBA AND DRIVER PACKAGES**
- **WINDOWS COMPONENTS**
- **NIMBLE WINDOWS TOOLKIT**

**PROVISIONING STORAGE**

- **WINDOWS HOST**
- **NIMBLE STORAGE ARRAY**
- **FIBRE CHANNEL SWITCH**
- **NIMBLE STORAGE ARRAY**
- **WINDOWS HOST**

**TROUBLESHOOTING**

- **NIMBLE STORAGE ARRAY**
- **FIBRE CHANNEL SWITCH**
- **WINDOWS HOST**
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<table>
<thead>
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<th>Revision</th>
<th>Description (author)</th>
</tr>
</thead>
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</table>

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Introduction

This guide is intended to outline best practices for connecting a Microsoft Windows host to a Nimble Storage array using fibre channel connections. A basic understanding of fibre channel concepts, Microsoft Windows environments, and Nimble Storage arrays is required. Instructions with technical tips will be provided.

Prerequisites

Supported fibre channel configuration, including:

- Nimble Storage array
- Fibre channel switch
- Microsoft Windows
- HBAs
- Drivers
- Associated cabling

HBA utilities from Emulex or QLogic, download from respective manufacturers site.


Configurations verified by Nimble Storage can be found on InfoSight.

HBA Utilities

Utilities are provided by HBA manufacturers to manage and control their adapters. These utilities are useful while provisioning LUNs, as well as when troubleshooting connectivity. The tools can provide an HBA level view of the SAN and any available targets. In most cases it is preferred to install these tools during initial deployment.

- Emulex – OneCommand
- QLogic – QConvergeConsole

Instructions for installation and use are provided by the HBA manufacturer.

Microsoft also provides a command line utility that uses HBA APIs to provide information similar to manufacturer’s utilities. The fcinfo.exe utility can be downloaded directly from Microsoft.
Nimble Windows Toolkit

The Nimble Windows Toolkit provides the Nimble Device Specific Module for MPIO as well as additional features such as Nimble VSS integration and Nimble Setup Manager. Installing the toolkit is highly recommended.

When installing the toolkit, read the release notes for the required Microsoft Windows Hotfixes.

Installation

Installation of components should be performed in a logical order beginning with hardware components and stepping through each piece of software.

HBA and Driver packages

Install the physical HBA in the server per manufacturer specifications and instructions. Once installation of hardware is complete, boot system into Windows and begin driver installation.

Locate driver packages on the manufacturer’s web site; a list of verified HBA and driver combinations is available on InfoSight.

Download and install appropriate driver package according to provided instructions.

Install HBA utilities.

Emulex Timeout

By default, Emulex HBAs set NodeTimeOut value to 30 seconds. In the event of a path failure, this can cause IO pause on the host for the assigned time out. Nimble recommendation is to set this value to 1 second. This allows the host to immediately continue IO. This setting is configured within Emulex OneCommand. Be sure to set the timeout at the host level or the setting will not be applied:
Windows Components

Enable MPIO in the Windows Server Manager, this can be found in the features section as Multipath I/O.

Review the list of required hotfixes for your version of Windows listed in the Nimble Windows Toolkit release notes.

Install the required hotfixes.

Nimble Windows Toolkit

Download the Nimble Windows Toolkit from InfoSight.

Install the Nimble Windows Toolkit following instructions provided.
Provisioning Storage

Provisioning storage to the host is accomplished by gathering information, creating the volume, configuring access, and formatting the newly provisioned storage. To accomplish this task access to the Windows host, fibre channel switch, and Nimble Storage array will be required.

Windows Host

Using HBA utilities or Microsoft fcinfo tool, record the WWPN for each initiator port on the Windows host.

Verify that the WWPNs match what is displayed.

Do not use the WWNN for the node.

Nimble Storage Array

Using the GUI, record the WWPNs for each target port on the Nimble Storage array. These can be found in Manage -> Arrays or Administration -> Network Configuration -> Interfaces.

Using the CLI, WWPNs can be found using the “fc –list” command.

Record the WWPNs for both the active and standby controllers.

Do not use the WWNN for the node.

Fibre Channel Switch

Configuration of the fibre channel switch is the most crucial and error prone step in the process. When configuring zoning be sure to check and double check all configurations.

Using the tools provided by the switch vendor, configure zoning for the fabric.

Single initiator zoning is an industry best practice. No more than one initiator port from the Windows server should be in each zone.

All target ports from the Nimble Storage array, both active and standby, can be in the zone with the single initiator.

Configure a zone for each initiator port on the Windows host.

Aliases can be assigned on the fibre channel switch to assign human readable names to WWPNs. If configuring aliases, record all aliases for use in array configuration.

Save and apply all configurations once zoning is complete. Double check that configurations are applied to the fabric.
Nimble Storage Array

On the Nimble Storage array, an initiator group should be created to control host access to the fibre channel volumes.

Initiator groups must contain the WWPNs of the initiator ports on the Windows host.

If aliases were configured on the fibre channel switch, aliases may also be used. Be aware that alias names must match exactly. If alias is used, both alias and WWPN must match before access to volume is granted.

Once the initiator group is created, provision a new volume.

Create a new volume using desired name, description, and performance policy.

Assign the initiator group created previously. LUN number will be set automatically, however if specific LUN number is desired it can be set manually.

Configure desired volume size and capacity settings.

Assign protection policy as required and complete volume creation.

Windows Host

Using Server Manager navigate to Disk Management.

Rescan to detect newly provisioned disks.

Partition and create new volumes on disk using Disk Management.
Troubleshooting

If volumes are not present on the Windows host after completing provisioning steps, the configuration should be reviewed beginning with the first step. When verifying the configuration pay close attention to WWPNs and zoning configuration.

Nimble Storage Array

Review the volume configuration by navigating to Manage -> Volumes and selecting the created volume.

Check that the proper initiator group is assigned and check the count of connected initiators to verify whether initiators are connected.

Click the initiator group name and verify proper WWPN and initiators exist.

Fibre Channel Switch

Review zoning configuration thoroughly.

Check for proper WWPNs for both initiator and target ports.

Save and apply zoning configuration to be sure configured zoning is currently active on the fabric.

Windows Host

Use the HBA utilities or fcinfo to investigate if targets are available to the HBA.

If no targets are available investigate the Nimble Storage array or fibre channel switch.

If targets are available begin troubleshooting the Windows storage stack using tools such as disk management and diskpart.