IBM System Storage SAN Volume Controller

SVC Version 4.2.1 - Host Attachment Guide SC26-7905-02

Update for Windows 2008 Server

February 2008

About this guide

This guide provides update information for chapter 8 in the SVC 4.2.1 IBM System Storage SAN Volume Host Attachment Guide and describes how to attach Windows 2008 Servers to an SVC cluster. The material in this guide should be read in conjuction with the existing material in the Host Attachment Guide available at: http://www.ibm.com/storage/support/2145.

Who should use this guide

San Volume Controller administrators and users that wish to attach Windows 2008 servers to their San Volume Controller should review the additional information provided in this update.

Last update

This document was last updated: 22 Feb 2008

Change History

The following revisions have been made to this document:

Revision	Date	Sections	Modified
1.0	22 Feb 2008	Chapter 8	Initial update

Table of Contents

Attaching to a host running the Windows Server 2008 operating system

This information explains the requirements and other information for attaching the SAN Volume Controller to a host running the Windows® Windows Server 2008 operating systems. See the following Web site for a list of the supported operating systems and interoperability information:

http://www.ibm.com/storage/support/2145.

Attachment requirements for hosts running Windows Server 2008 operating systems

This section provides an overview of the requirements for attaching the SAN Volume Controller to a host running the Windows Server 2008 operating systems. The following list provides the requirements for attaching the SAN Volume Controller to this host.

- Check the LUN limitations for your host system. Ensure that there are enough fibre-channel adapters installed in the server to handle the total LUNs that you want to attach.
- Ensure that you have the documentation for your Windows operating system and the IBM System Storage SAN Volume Controller: Hardware Installation Guide. All SAN Volume Controller publications are available from the following Web site:
  http://www.ibm.com/storage/support/2145
- Ensure that you have installed the supported hardware and software on your host, including the following:
  – Operating system service packs and patches
  – Host Bus Adapters (HBAs)
  – HBA device drivers
  – Multipathing drivers

The following Web site provides current interoperability information about HBA and platform levels:

http://www.ibm.com/storage/support/2145

Drivers and firmware for hosts running Windows Server 2008 operating systems

Ensure that you use the correct host bus adapter device driver and firmware levels for your hosts. The following Web site provides current interoperability information about supported device driver and firmware levels:

http://www.ibm.com/storage/support/2145

Installing the HBA driver for hosts running the Windows Server 2008 operating system.

After you install the host bus adapter (HBA) into the host machine, you must download and install the appropriate HBA driver. Follow each manufacturer's instructions to upgrade the BIOS levels for each type of HBA.

Configuring the QLogic HBA for hosts running Windows Server 2008 operating systems

After you have installed the QLogic HBA and the device driver, you must configure the HBA. Customers can use QLogic SANSurfer to configure HBA settings with the default parameters or reboot into the QLogic BIOS to configure the HBA settings.

Configuring the Emulex HBA for hosts running Windows Server 2008 operating systems

After you install the Emulex host bus adapter (HBA) and the driver, you must configure the HBA. For the Emulex HBA StorPort driver, accept the default settings and set topology to 1 (1=F_Port Fabric).

Configuring the Windows Server 2008 operating systems

You must configure the Windows Server 2008 operating system before you can use the hosts with the SAN Volume Controller. Before you configure the host operating systems, the following tasks must be completed:

The IBM service representative must have installed the SAN Volume Controller.
You must have installed the appropriate host bus adapter and driver on your host system.

After the prerequisite tasks are complete, use the following general steps to configure your operating system:

Zone the host system to the SAN Volume Controller on the Fibre Channel SAN.
Install the appropriate multipathing driver for your host system to enable the management of multiple paths to SAN Volume Controller virtual disks (VDisks).
Create the host system on the SAN Volume Controller, using the worldwide port names (WWPNs). Map the VDisks to the host as required.
Create volumes/disks on your host using instructions in your host system publications.

Multipath support for host running the Windows Server 2008 operating systems

You must install a multipathing software on all attached hosts that run the Windows Server 2008 operating systems. The following Web site provides current interoperability information:

http://www.ibm.com/storage/support/2145

Multipathing configuration maximums

When you configure, keep in mind the maximum configurations for hosts. The following table provides the configuration maximums for hosts running the Windows Server 2008 operating systems:

Object	Maximum	Description
VDisk	512 (See Note 1.)	The maximum number of VDisks that can be supported by the SAN Volume Controller for a host running a Windows operating system (per host object)
Paths per VDisk (See Note 2.)	8	The maximum number of paths to each VDisk. The recommended number of paths is 4.

Notes:

1. You can assign a maximum of 26 individual drive letters to a host running a Windows operating system. However, Windows Server 2008 also supports submounting drives as directories within other drives.
2. SDDDSM for Windows Server 2008 actually support 16 paths per VDisk, but the SAN Volume Controller supports only a maximum of 8 paths to support a reasonable path-failover time.
3. Check your operating system and HBA documentation for limitations that may be imposed by other driver software.

MPIO/SDDDSM dynamic pathing

You must use the Microsoft Multipath I/O (MPIO) driver for dynamic pathing when you also use the IBM subsystem device driver device specific module (SDDDSM).

Restriction:

Note 1: When you use SDDDSM for multipathing, you must use the Storport Miniport driver for Emulex HBAs and the STOR Miniport driver for Qlogic HBAs.

MPIO supports dynamic pathing when you add more paths to an existing VDisk and when you present a new VDisk to the host. No user intervention is required, other than is normal for a new device discovery under a Windows operating system.

SDDDSM uses a load-balancing policy that tries to equalize the load across all preferred paths. If preferred paths are available, SDDDSM uses the path that has the least I/O at the time. If SDDDSM finds no available preferred paths, it tries to balance the load across all the paths it does find and uses the least active non-preferred path.

Path probing and reclamation is provided by MPIO and SDDDSM. For SDDDSM, the interval is set to 60 seconds. You can change this by modifying the following Windows system registry key:

HKLM\SYSTEM\CurrentControlSet\Services\mpio\Parameters\PathVerificationPeriod.

Configuring hosts running Windows Server 2008 operating systems for SAN Boot

If you want to use the SAN Volume Controller as a boot device for a host running either the Windows Server 2008 operating system, you must configure the system correctly.

SAN boot is not supported on all operating systems. See the following Web site for the latest support information:

http://www.ibm.com/storage/support/2145

Use the following steps to configure the operating system:

1. Configure the SAN Volume Controller so that only the boot virtual disk (VDisk) is mapped to the host.
2. Configure the Fibre Channel SAN so that the host can see only one SAN Volume Controller node port. This means that there is only one path from the host to its boot disk.
3. Configure and enable the HBA BIOS.
4. Install the operating system, using the normal procedure, selecting the VDisk as the partition on which to install.

5. After the operating system, the subsystem device driver device specific module (SDDDSM), and Microsoft Multipath I/O driver is installed, zoning should be modified to allow multiple paths.
6. Set redundant boot devices in the BIOS to allow the host to boot when its original boot path has failed.

Migrating existing SAN boot images

If you have a host that runs a Windows Server 2008 operating system and existing SAN boot images that are controlled by storage controllers, you can migrate these images to image-mode virtual disks (VDisks) that are controlled by the SAN Volume Controller. Perform the following steps to migrate your existing SAN boot images:

1. Shut down the host.
2. Perform the following configuration changes on the storage controller:
    a. Remove all the image-to-host mappings from the storage controller.
    b. Map the existing SAN boot image and any other disks to the SAN Volume Controller.
3. Zone one port of each host bus adapter (HBA) to one of the SAN Volume Controller ports that is associated with the I/O group for the target image-mode VDisk.
4. Perform the following configuration changes on the SAN Volume Controller:
    a. Create an image-mode VDisk for the managed disk (MDisk) that contains the SAN boot image. Use the MDisk unique identifier to specify the correct MDisk.
    b. Create a host object and assign it to the HBA port that you zoned to the SAN Volume Controller port in step 3.
    c. Map the image mode VDisk to the host. For example, you might map the boot disk to the host with SCSI LUN ID 0.
    d. Map the swap disk to the host, if required. For example, you might map the swap disk to the host with SCSI LUN ID 1.
5. Change the boot address of the host by performing the following steps:
    a. Restart the host and open the BIOS utility of the host during the booting process.
    b. Set the BIOS settings on the host to find the boot image at the worldwide port name (WWPN) of the node that is zoned to the HBA port.
6. Boot the host in single-path mode.
7. Uninstall any multipathing driver that is not supported for SAN Volume Controller hosts that run the Windows Server 2008 operating system.
8. Install a supported multipathing driver.
9. Restart the host in single-path mode to ensure that the supported multipath driver was properly installed.

10. Zone each HBA port to one port on each SAN Volume Controller node.
11. Add additional HBA ports to the host object that you created in step 4b above.
12. Configure the HBA settings on the host by using the following steps:
    a. Restart the host and open the host's BIOS utility during the booting process.
    b. Ensure that all HBA ports are boot-enabled and can see both nodes in the I/O group that contains the SAN boot image. Configure the HBA ports for redundant paths.
    c. Exit the BIOS utility and finish booting the host.
13. Map any additional VDisks to the host as required.

Clustering support for Windows Server 2008 operating systems

Refer to the Web Site for information regarding clustering support on Windows 2008

Known limitations for hosts running Windows Server 2008 operating systems

There are known limitations when attaching to a host that runs Windows Server 2008 operating systems.

- It is not possible to bring a Metro Mirror or Global Mirror Auxiliary vdisk online in Windows 2008 when the relationship is active, because the vdisk is read-only. This action can cause Disk Management to become unresponsive on the host
- Disk discovery may require rebooting Windows.

The following Web site provides the most current information about known restrictions for hosts and details about using the SAN boot feature with Microsoft clusters:

http://www.ibm.com/storage/support/2145