IBM System Storage N series

Data ONTAP DSM 3.5 for Windows MPIO Release Notes

Contents

Data ONTAP DSM 3.5 for Windows MPIO Release Notes

These release notes describe new features, enhancements, and known issues for Data ONTAP DSM 3.5 for Windows MPIO.

These release notes apply to the DSM version 3.5. Release notes might be updated between product releases. You should periodically check online for updated Release Notes on the IBM N series support web site, located at: www.ibm.com/storage/support/nseries/

- "DSM overview"
- "Information on finding system requirements"
- "New features in this DSM release"

DSM overview

The Data ONTAP DSM for Windows MPIO enables you to manage multiple Fibre Channel (FC) and iSCSI paths between an IBM N series storage system and a Windows host computer.

You can have one or more active paths and zero or more passive paths, depending on the load balance policy. The DSM automatically selects paths for I/O as needed, maximizing throughput and maintaining the host's access to its storage.

The DSM has both graphical and command line management interfaces. You can install the DSM interactively or from a Windows command prompt.

Information on finding system requirements

IBM qualifies additional components between releases of the Host Utilities software.

The most up-to-date information on the system requirements is specified in the N series interoperability matrix available on the IBM N series support website (accessed and navigated as described in "Websites" on page 31).

New features in this DSM release

The Data ONTAP DSM 3.5 for Windows MPIO includes several new features and support for additional configurations.

DSM 3.5 includes the following changes from DSM 3.4:

- New Windows PowerShell cmdlets are available to manage the DSM.

  The cmdlets replace the `dsmcli` commands, which are deprecated starting in DSM 3.5. The `dsmcli` commands will be removed in a future release.
- The Windows Host Utilities are no longer required.

  The Windows Host Utilities components that enable you to configure Hyper-V systems (mbralign.exe and LinuxGuestConfig.iso) are now included with the DSM.

  Note: Installing the Windows Host Utilities on the same host as the DSM is still supported.
- Hyper-V guests running Red Hat Enterprise Linux (RHEL) are now supported.

  The supported versions are specified in the N series interoperability matrix, available on the IBM N Series support website (accessed and navigated as described in "Websites" on page 31).
- The number of reboots required to install or upgrade the Data ONTAP DSM is reduced. For example, when you install Windows hotfixes, you can wait to reboot the host until after you install or upgrade the DSM.
- The timeout values set by Data ONTAP DSM are updated based on ongoing testing.
- The options that you use in the graphical user interface (GUI) to specify preferred paths for the Round Robin with Subset policy has changed.

  Use the `Set Preferred` and `Clear Preferred` options to specify preferred paths. The `Set Active` and `Set Passive` options are no longer available for Round Robin with Subset.

  Note: These changes do not alter the working of Round Robin with Subset policy. Round Robin with Subset is still an "active/active" policy that enables you to specify preferred and non-preferred paths. The changes align the GUI terminology with how the policy works.

Updates to the release notes

The release notes might be updated between product releases. This section lists any updates since the original release.

May 2012 update

In May 2012, the Release Notes were updated with the following information:
- For Windows 2003 hosts in a Microsoft Cluster Server (MSCS) configuration, the recommended value for the `ReservationRetryInterval` parameter has changed from 1 to 2.
- New important cautions were added.

  "Limit number of installed adapters on systems operating in 7-Mode" on page 5

  "iSCSI driver parameters not set for the Emulex OCe10102 CNA" on page 5
- New known problems and limitations were added.

  "Windows 2003 MSCS hosts might not see all LUNs or paths after uninstalling Data ONTAP DSM" on page 9

  "Windows 2003 MSCS hosts lose access to LUNs when moving a volume" on page 16
- The known problem with the DSM installation program not automatically configuring QLE8240 and QLE8242 adapters was updated to specify the adapter driver level to which this issue pertains.

  "QLE8240 and QLE8242 adapters not configured automatically" on page 17
- Links to external web pages were updated, including links to the N series support website (accessed and navigated as described in "Websites" on page 31).

The Data ONTAP DSM for Windows MPIO Installation and Administration Guide was also updated to add new information.

Important cautions

Before deploying this release of Data ONTAP DSM for Windows MPIO, make sure that you read the following items to identify and resolve issues that might affect the operation of your systems.

- "Limit number of installed adapters on systems operating in 7-Mode"
- "iSCSI driver parameters not set for the Emulex OCe10102 CNA"
- "Windows Server 2008 R2 upgrade issues" on page 6
- "Do not manually create files on Windows Server 2008 R2 CSV" on page 6
- "Windows crashes after setting Chelsio 10 Gb NIC MTU to 9000" on page 7
- "Enabling ALUA might require a Windows reboot" on page 7
- "Emulex FC HBA timeouts not set by DSM installation program" on page 7
- "Problems installing Windows hotfix KB982109" on page 7

Limit number of installed adapters on systems operating in 7-Mode

If you use Data ONTAP DSM 3.5 to manage the paths between Windows hosts and a storage system that runs Data ONTAP operating in 7-Mode, then you need to limit the number of adapters installed on a storage system's target ports.

Data ONTAP DSM 3.5 can support up to 48 adapters installed on the target ports of a High Availability (HA) pair. More than 48 adapters can impact the DSMs ability to manage all paths. The Windows host can incorrectly interpret a LUN as two different disks.

Install and configure no more than 24 adapters per node in an HA pair.

iSCSI driver parameters not set for the Emulex OCe10102 CNA

The Data ONTAP DSM does not set the iSCSI driver parameters for the Emulex OCe10102 converged network adapter (CNA).

You need to manually set the driver parameters.

Setting the iSCSI driver parameters for the Emulex OCe10102 CNA

The Data ONTAP DSM installer does not set the iSCSI driver parameters for the Emulex OCe10102 CNA. You need to manually set the parameters.

About this task

A reboot is required after you set the parameters.

Procedure

1. Load the Windows Registry Editor.
2. Navigate to **HKLM\SYSTEM\CurrentControlSet\services\be2iscsi\
   Parameters\Device \DriverParameters**.
3. Enter the following value for the **ldto** parameter:

   1 (REG_DWORD)
4. Enter the following value for the **eto** parameter:

   10 (REG_DWORD)
5. Reboot your Windows host.

Windows Server 2008 R2 upgrade issues

Upgrades to Windows Server 2008 R2 require you to address certain issues.

Be sure to read the upgrade information provided by Microsoft. The following
issues are especially important.

- Be sure to upgrade to DSM 3.3.1 or later before upgrading to Windows
  Server 2008 R2.
- You cannot upgrade to Windows Server 2008 R2 while the host is part of a
  Windows cluster. Remove the host from the cluster before upgrading.
- After clustering a Windows host running Windows Server 2008 R2, run the
  Repair option of the Data ONTAP DSM for Windows MPIO installation
  program to set the required value of the \HKLM\Cluster\ClusSvcHangTimeout
  parameter.
- For iSCSI-booted Windows Server 2008 hosts, there is no way to upgrade to
  Windows Server 2008 R2. You must do a fresh installation of Windows
  Server 2008 R2. This is a Microsoft limitation.

Do not manually create files on Windows Server 2008 R2 CSV

Manually creating or copying files to a Windows Server 2008 R2 cluster
shared volume (CSV) can corrupt the data on the volume.

The only files allowed on a CSV are the files written by the Hyper-V
administrative tools. This includes any user or application data stored under
the C:\ClusterStorage directory on every node.

Windows crashes after setting Chelsio 10 Gb NIC MTU to 9000

Enabling jumbo frames (MTU = 9000) on a Chelsio 10 Gb NIC can crash Windows Server 2008 R2.

Do not enable jumbo frames on the Chelsio 10 Gb NIC on Windows Server 2008 R2.

This problem has been reported to Microsoft and Chelsio, and is expected to be fixed in a future version of the Chelsio driver.

Enabling ALUA might require a Windows reboot

In some situations, you must reboot Windows after enabling ALUA on LUNs mapped to that Windows host. ALUA must be enabled when using the Microsoft DSM (msdsm) included with Windows Server 2008.

A reboot is required if ALUA is enabled on an igroup and the host has already discovered LUNs from that igroup. A disk rescan of the host does not set the load balance policies or the target portal group properties correctly. Rescan does not cause a stack tear down and rebuild of MPIO LUNs, so the new ALUA property is not detected.

If you enable ALUA on a new igroup and then map LUNs to that igroup, no reboot is needed.

Emulex FC HBA timeouts not set by DSM installation program

The DSM installation program runs the fcconfig program to set timeouts for Fibre Channel (FC) host bus adapters (HBAs). However, for some Emulex FC HBAs, the correct timeouts are not set, which can cause failover problems.

After installing or repairing the Data ONTAP DSM, you should use the Emulex OneCommand Manager to verify, and if necessary, set the required `LinkTimeOut` and `NodeTimeOut` values.

For DSM, `LinkTimeOut` must be set to 1 and `NodeTimeOut` must be set to 10.

Problems installing Windows hotfix KB982109

You might have problems installing required Windows hotfix KB982109 on Windows Server 2003, depending on which MPIO version, if any, installed. Also, the hotfix requires a reboot, but it does not prompt for reboot.

When you try to install Windows hotfix KB982109 on a Windows Server 2003 host that does not have the required version of Windows MPIO components installed, you receive the following error message:

```
Setup cannot continue because one or more prerequisites required to
install KB982109 failed...
```

The Data ONTAP DSM installation program installs the required MPIO components on the Windows host. The DSM installation program prompts you to install this hotfix after the DSM installation is complete. The hotfix can be successfully installed after the DSM, because the required prerequisites are then available.

Attention: You must reboot the Windows host after installing the hotfix, even though the hotfix does not prompt you to reboot.

Known problems and limitations

Some unexpected and potentially undesired behaviors, as well as, in some cases, workarounds to avoid these behaviors, have been identified in this release.

- "Installation issues"
- "GUI and CLI issues" on page 13
- "Interoperability issues" on page 15

Installation issues

You might encounter the following issues when you install Data ONTAP DSM for Windows MPIO.

- "Windows 2003 MSCS hosts might not see all LUNs or paths after uninstalling Data ONTAP DSM"
- "Error when installing hotfixes" on page 11
- "Installing or uninstalling DSM takes a long time in MSCS configurations" on page 11
- "Error messages when adding account during installation" on page 11
- "Uninstalling from SAN-booted Windows Server 2003 host" on page 12
- "Internal Error: Access is Denied during installation" on page 12

Windows 2003 MSCS hosts might not see all LUNs or paths after uninstalling Data ONTAP DSM

A Windows Server 2003 host that is connected through iSCSI might experience failed clustered resources, missing paths, and missing LUNs after you uninstall Data ONTAP DSM.

This issue occurs on Windows Server 2003 hosts that are setup as follows:

- The host is in a Microsoft Cluster Server (MSCS) configuration and LUNs are configured as clustered resources.
- The MSiSCDSM is installed and it is not configured to use persistent reservations.

  Note: The MSiSCDSM is the device-specific module driver for iSCSI. It installs with the iSCSI software initiator.
- The Data ONTAP DSM is installed.

If you uninstall the Data ONTAP DSM, the MSiSCSDSM puts a SCSI-2 reservation on the LUNs because the MSiSCSDSM is not configured to use

persistent reservations. The SCSI-2 reservation can result in failed clustered resources, missing paths, and missing LUNs. Reinstalling the Data ONTAP DSM does not clear the SCSI-2 reservation.

To confirm that this issue has occurred, view the current reservation information for any affected LUNs. For Data ONTAP operating in 7-Mode, use the `lun persistent_resv show` command. For Data ONTAP operating in Cluster-Mode, use the `lun persistent-reservation show` command. These commands are available at the advanced privilege level.

To correct this issue, take the affected LUNs offline, bring them back online, and then reboot the host cluster nodes. For Data ONTAP operating in 7-Mode, use the `lun offline` and `lun online` commands. For Data ONTAP operating in Cluster-Mode, use the `lun modify` command.

To avoid this issue, enable persistent reservation on each host in the Windows cluster.

Enabling persistent reservation on Windows 2003 hosts in a Microsoft Cluster Server

Enable persistent reservation on Windows 2003 hosts in a Microsoft Cluster Server (MSCS) to prevent an issue with failed clustered resources, missing paths, and missing LUNs.

About this task

Perform these steps on each Windows Server 2003 host in the MSCS.

The DSM uses a persistent reservation key to track which host in an MSCS is currently allowed to write to a LUN.

Refer to the Microsoft iSCSI Software Initiator Users Guide for information about configuring the MSiSCDSM to use persistent reservations.

Steps
1. Load the Windows Registry Editor.
2. Navigate to **HKLM\System\CurrentControlSet\Services\MSiSCDSM\ PersistentReservation**.
3. Enter the following value for the **UsePersistentReservation** parameter: 1
4. Change the value for the **PersistentReservationKey** parameter to an 8-byte value unique to the cluster.

The **PersistentReservationKey** must be the same for each node in the cluster.

Error when installing hotfixes

When installing required Windows hotfixes, you might get an error message saying the hotfix does not apply to your system.

Some hotfixes have a dependency on other hotfixes. Install the hotfixes in numerical order to ensure they are accepted.

Many hotfixes prompt you to reboot your system. You can wait until all hotfixes are installed before rebooting. If you are installing Data ONTAP DSM immediately after the hotfixes, you can wait and reboot when prompted by the DSM installation program.

Installing or uninstalling DSM takes a long time in MSCS configurations

Installing or uninstalling the Data ONTAP DSM for Windows MPIO can take a long time on Windows hosts in a Microsoft cluster (MSCS) configuration.

The long install and uninstall times are a result of the way multipathing works with MSCS. In large production environments, times of one hour have been observed.

You can simply choose to let the process run, with the understanding that it might take a long time to complete.

Another option is to shut down one node in the cluster, install or uninstall the DSM software on the running node, shut down the first node, and repeat the process on the second node.

Error messages when adding account during installation

When you try to add the service account during DSM installation, you see one or both of the following messages:

- `error in object picker Dialog: Description Invalid access to memory location`
- `The exception unknown software exception (0x0000005) occurred in the application at location address`

This problem has been observed on Windows Server 2003 x64 processor systems.

The first message (`error in object picker Dialog: Description Invalid access to memory location`) is displayed when you click **Add** to add a new account for the DSM service. The installation does not continue. The second message is displayed when you cancel the installation program.

The workaround is to restart the DSM installation program.

Uninstalling from SAN-booted Windows Server 2003 host

Uninstalling the Data ONTAP DSM can cause the Windows Server 2003 host to lose access to its boot LUN. Uninstalling the DSM leaves the host in an unstable state.

- Avoid uninstalling the DSM from a SAN-booted host.
- You can always upgrade a SAN-booted host to a new DSM version without uninstalling.

Note: If you must uninstall the DSM, contact technical support for assistance.

Internal Error: Access is Denied during installation

On Windows Server 2008, you might receive an `Internal Error: Access is Denied` message if User Access Control is enabled and installation is attempted from a user account other than Administrator.

There are two workarounds for this problem: installing from an elevated command prompt or disabling User Access Control.

For more information about User Access Control, see the Microsoft TechNet article: User Account Control Step-by-Step Guide.

Installing from an elevated command prompt

Run the installation from an elevated command prompt to avoid the `Internal Error: Access is Denied` error.

Before you begin

An elevated command prompt is required to install the DSM when User Access Control (UAC) is enabled. The elevated command prompt overrides the UAC restrictions.

Steps

1. Click **Start**.
2. Right-click **Command Prompt** and then click **Run as Administrator**.
3. Run the installation program by navigating to the directory containing the installation package and entering the package name at the command prompt.

Disabling User Access Control

Disable User Access Control to avoid the `Internal Error: Access is Denied` error.

Steps

1. Log in as an administrator.
2. Select **Control Panel > User Accounts > Turn User Account Control on or off**.
3. Clear the **Use User Access Control (UAC) to help protect your computer** check box and then click **OK**.
4. Run the installation program again.

GUI and CLI issues

You might encounter the following issues as you use the Data ONTAP DSM for Windows MPIO GUI and CLI.

- "Data ONTAP DSM GUI closes unexpectedly after entering an invalid or expired license"
- "dsmcli returns the error "The MPIO module is not licensed""
- "LUN paths remain in Failed state after a communication disruption to the storage system" on page 14
- "DSM does not display virtual disks" on page 14
- "DSM GUI and CLI display 0.0.0.0 for initiator address" on page 14
- "Full DSM feature set not available using Microsoft user interfaces" on page 14
- "New LUNs do not appear in DSM GUI or CLI" on page 15

Data ONTAP DSM GUI closes unexpectedly after entering an invalid or expired license

If you enter an invalid or expired license, the Data ONTAP DSM graphical user interface (GUI) might close unexpectedly. An error message states that the Microsoft Management Console (MMC) has detected an error.

To correct this issue, run the **Repair** option of the Data ONTAP DSM installation program. When prompted, enter a valid license key.

dsmcli returns the error "The MPIO module is not licensed"

The `dsmcli` commands might return the error "`The MPIO module is not licensed`" even though Data ONTAP DSM is licensed. This issue occurs when you run the `dsmcli` commands under a user account that does not have administrative privileges on the host.

LUN paths remain in Failed state after a communication disruption to the storage system

On Windows Server 2003 and Windows Server 2008 hosts, a path can stay in the Failed state when it fails and comes back online, but has not encountered an I/O error. The failed paths are caused by an inconsistency in the LUN path state between the Windows MPIO component and the Data ONTAP DSM.

A path marked as Failed by Data ONTAP DSM is only recovered when the MPIO component performs a successful path verification on that path. Because the MPIO component does not believe that the path is failed (no I/O error), it does not perform the verification and the path is stuck in the failed state.

You can do one of the following to resolve this issue:

- Use the Data ONTAP DSM graphical user interface (GUI) to identify the Fibre Channel or IP network interface that is used for the failed path. Disable that interface for 30 seconds and then enable it. After you enable the interface, the LUN paths are discovered and usable again.
- Reboot the Windows host to recover the failed paths.

DSM does not display virtual disks

A Windows Server 2003 or Windows Server 2008 host running Data ONTAP DSM fails to display virtual disks (LUNs) that are created.

The virtual disks work correctly, but cannot be viewed or managed using the DSM GUI or CLI.

Contact technical support for assistance on this issue.

DSM GUI and CLI display 0.0.0.0 for initiator address

When viewing the paths for a virtual disk in the DSM GUI, or when running the `dsmcli path list -v` CLI command, the iSCSI initiator address is displayed as 0.0.0.0.

This problem occurs only when the iSCSI session is created and the initiator address is allowed to default in the Microsoft iSCSI initiator.

When creating an iSCSI session, manually select the initiator address.

Full DSM feature set not available using Microsoft user interfaces

All management functions of the Data ONTAP DSM are not available through the native Microsoft user interfaces, such as the Microsoft iSCSI GUI.

Use the GUI or CLI supplied with the Data ONTAP DSM for management. The DSM GUI is available from Windows Computer Management. For more information, see the *Data ONTAP DSM for Windows MPIO Installation and Administration Guide*.

New LUNs do not appear in DSM GUI or CLI

When you add new LUNs to your storage system, the new virtual disks are not automatically discovered by the Windows host. You must manually rescan disks.

Steps

1. On the Windows host, select **Start > Administrative Tools > Computer Management**.
2. Select **Storage > Disk Management** in the navigation pane.

   The Initialize and Convert Disk wizard starts.
3. If the wizard does not start, select **Action > Rescan Disks**.
4. Follow the prompts to initialize the disks, but do not convert them to dynamic disks.
5. Partition and format the disks, if required.
6. Refresh the DSM GUI display.

Interoperability issues

You might encounter the following issues with your host's configuration.
- "Windows 2003 MSCS hosts lose access to LUNs when moving a volume" on page 16
- "QLE8240 and QLE8242 adapters not configured automatically" on page 17
- "Raw passthru SCSI disks on a guest OS are not available when running MPIO on the guest" on page 18
- "Windows Server 2008 cluster node hangs and takeover of disk resources fails when both ISLs are down in MetroCluster configuration" on page 19
- "Windows Server 2008 R2 cluster node takes about 7 minutes to establish persistent reservation during bootup" on page 19
- "Oracle 10g RAC Voting Disk using Windows igroup fails with I/O error during giveback" on page 20
- "I/O errors during repeated connectivity disruptions of iSCSI connections" on page 20
- "iSCSI sessions do not reconnect after reboot with mixed IPv4 and IPv6" on page 20
- "Configuring passthru disks for Windows 2008 R2 Hyper-V" on page 20
- "Cluster Shared Volume not accessible from one node in a Windows 2008 failover cluster" on page 21

Windows 2003 MSCS hosts lose access to LUNs when moving a volume

Windows 2003 hosts in a Microsoft Cluster Server (MSCS) configuration might lose access to LUNs when you move the containing volume to a different aggregate.

To prevent this issue, change the value for the ReservationRetryInterval parameter from 1 to 2.

Changing the value for the ReservationRetryInterval parameter

For Windows 2003 hosts in a Microsoft Cluster Server (MSCS) configuration, you should change the value for the `ReservationRetryInterval` parameter from 1 to 2. This change reduces the likelihood that the Windows host will lose access to a LUN when you move a volume to a different aggregate.

About this task

A reboot is required after you change the parameter.

If you reinstall or repair the Data ONTAP DSM after you set this parameter, you need to set it again.

Steps

1. Load the Windows Registry Editor.
2. Navigate to **HKLM\SYSTEM\CurrentControlSet\Services\ontapdsm\ Parameters**.
3. Enter the following value for the **ReservationRetryInterval** parameter: 2
4. Reboot your Windows host.

QLE8240 and QLE8242 adapters not configured automatically

The QLogic converged network adapter (CNA) models QLE8240 and QLE8242 are supported in specific Windows host configurations. You must manually install the QLogic software packages and set the adapter timeout if you have driver level 9.1.9.19 or later.

The IBM N series interoperability matrix lists the supported Windows configurations and required driver and firmware versions for these adapters when using the iSCSI offload and FCoE functionality.

When using the adapter as a simple 10 GbE NIC, special configuration is not needed. The interoperability matrix does not list Ethernet NICs. If the adapter is used for standard iSCSI or NAS traffic, then it is supported with IBM N series storage systems.

The Data ONTAP DSM installation program does not automatically configure the required settings for the QLE8240 and QLE8242 if you have driver level 9.1.9.19 or later. The following manual steps are required:

1. Install the QLogic software packages (driver/firmware, host agents, and management CLI).
2. Set the adapter timeouts using the QConvergeConsole CLI.

Installing the QLogic software packages

Download and install the QLogic software packages to load the supported firmware and driver on the adapter. Also download and install the management software to configure and manage the adapter.

Steps

1. Check the N series interoperability matrix for the required driver and firmware versions.

2. Download the software packages from the QLogic download page.

   You need the following packages:
   - Windows Superinstaller (x86/x64) package
   - Optional QConvergeConsole (x86/x64) GUI management tool
3. Install the packages according to the QLogic documentation.

Setting the adapter timeouts using QConvergeConsole

The adapter requires specific timeout settings that are not set by the current host software.

Before you begin

The QConvergeConsole CLI must already be installed on the Windows host computer.

Steps
1. Using the QConvergeConsole CLI, enter the following command to set the adapter LinkDownTimeout to 1:

   ```
   qaucli -pr fc -n port_number lt 1
   ```
2. Enter the following command to set the adapter PortDownRetryCount to 10:

   ```
   qaucli -pr fc -n port_number pd 10
   ```

Note: port_number is the number of the port on a multi-port adapter. The setting must be made to each port of a multi-port adapter.

Raw passthru SCSI disks on a guest OS are not available when running MPIO on the guest

If you run MPIO software on a guest OS (for iSCSI directly from the guest), and you also configure raw passthru disks as SCSI physical disks from the parent, the guest is unable to use the raw disks.

This issue occurs with the Data ONTAP DSM for Windows MPIO and the Veritas DMP DSM.

When you are running MPIO on the guest, map raw drives as IDE physical disks.

Windows Server 2008 cluster node hangs and takeover of disk resources fails when both ISLs are down in MetroCluster configuration

In a MetroCluster storage configuration, when both the front-end and back-end Inter-Switch Links (ISLs) are down and a group move is attempted between local sites, the move is unsuccessful and the Windows cluster nodes hang.

The root cause for this cluster hang is the enumeration of the disks that causes a READ command to be sent to the disk in the remote storage site. The READ command is attempted across the ISL which is down, but the command fails because there is no path to the remote disk.

Even though the disk from the remote storage site is not part of the resource group being moved, because the remote disk is part of the node's storage resources and is mounted in both the local and remote sites, the disk enumeration tries to access the remote disk to match its device ID.

Before doing a group move in the local site when the MetroCluster ISLs are down, you should manually disable the disks belonging to the remote sites using the Windows Device Manager or Windows Disk Management.

After disabling the remote disks, the group move succeeds. Because the remote disks are disabled, when Windows cluster does a disk enumeration, the READ commands are not sent to the remote site.

It is important to note that the remote disks must be disabled on BOTH the nodes (source and destination) in the LOCAL site before doing the group move.

Windows Server 2008 R2 cluster node takes about 7 minutes to establish persistent reservation during bootup

You can reduce the bootup time for a Windows Server 2008 R2 host in a failover cluster configuration by changing the cluster service startup setting.

The delay in establishing the persistent reservation is caused by the cluster service terminating unexpectedly while the Data ONTAP DSM is performing device discovery after the reboot. The cluster service recovers automatically by restarting after about 5 minutes and establishes reservations.

To improve bootup time, you can set the Cluster service **Startup Type** value to **Automatic (Delayed Start)** in the Windows Services Microsoft Management Console (MMC) snap-in. This reduces the time to establish the persistent reservation to about 1 minute.

Oracle 10g RAC Voting Disk using Windows igroup fails with I/O error during giveback

When using Oracle 10g RAC, you can avoid I/O errors by specifying the igroup type to which the LUNs used by Oracle are mapped as "linux".

I/O to the Oracle Voting Disk in Oracle 10g Real Application Clusters (RAC) on Windows Server 2003 times out during a storage controller giveback. I/O to the unreachable partner controller is dropped by the target if the igroup type for the LUN is windows.

If the igroup type is linux, the target returns an error instead of dropping the SCSI commands. This causes the I/O to be retried by the application (Oracle 10g) and the Voting Disk does not fail.

I/O errors during repeated connectivity disruptions of iSCSI connections

Windows hosts with fewer than four iSCSI paths to the storage system might experience I/O errors when the iSCSI connections have repeated connectivity disruptions.

Ongoing testing has identified a potential problem when a host running the iSCSI software initiator has a small number of iSCSI paths and the iSCSI connections are repeatedly disrupted. This issue has not been seen with systems that have four or more iSCSI paths.

There are two workarounds for this issue:
- Create additional iSCSI paths to the storage controllers. The best practice is to have multiple subnets using independent Ethernet switches.
- Change the value of the LinkDownTime parameter in the Windows registry. This value is set by the Host Utilities installation program based on your configuration.

The LinkDownTime parameter is set in the *HKLM\SYSTEM\CurrentControlSet\Control\Class\{iSCSI_driver_GUID}\instance_ID\Parameters\LinkDownTime* parameter.

iSCSI sessions do not reconnect after reboot with mixed IPv4 and IPv6

In a multipath I/O (MPIO) configuration or multiple connections per session (MCS) configuration that has both IPv4 and IPv6 endpoints, some iSCSI sessions might fail to reconnect after rebooting the Windows host.

To ensure that all of your iSCSI paths return after a reboot, use either all IPv4 endpoints or all IPv6. Do not mix IPv4 and IPv6.

Configuring passthru disks for Windows 2008 R2 Hyper-V

There are two procedures for configuring passthru disks for Windows 2008 R2 Hyper-V virtual machines in an HA configuration.

Select the appropriate configuration depending on whether the virtual machine already belongs to a cluster.

Configuring a passthru disk for a VM not yet in the cluster

Use this procedure to configure a passthru disk for a Windows 2008 R2 Hyper-V HA virtual machine (VM) if the VM is not yet added to the failover cluster.

Steps
1. Verify that the disk being added is not configured to be managed by the cluster. If it is a cluster resource, delete it from the cluster.
2. Add the disk as a passthrough disk to the VM, using Hyper-V Manager.
3. After verifying that the passthrough disk is working with the VM, shut down the VM.
4. Add the disk to the failover cluster.

   The disk appears in **Available Storage** in Failover Cluster Manager.
5. Add the VM to the cluster using Failover Cluster Manager.

Configuring a passthru disk for a VM already in the cluster

Use this procedure to configure a passthru disk for a Windows 2008 R2 Hyper-V HA virtual machine (VM) if the VM is already added to the failover cluster.

Steps
1. In Failover Cluster Manager, verify the disk that will be the passthru disk is listed in **Available Storage**. Take the disk offline, but do not delete from the cluster.
2. Using Failover Cluster Manager, shut down the VM to which you are adding the disk.
3. Using Hyper-V Manager, add the passthru disk to the VM.
4. In Failover Cluster Manager, select the VM, and then select **Refresh virtual machine configuration** in the Action pane.

   The passthru disk is added to the group that the VM is in and brought online automatically.
5. Start the VM.

   The passthru disk is available.

Cluster Shared Volume not accessible from one node in a Windows 2008 failover cluster

From a node in a Windows 2008 failover cluster, if a CSV volume is accessed, an error message CSV Volume not accessible is displayed.

The event log contains an error message similar to *Cluster service failed to create a cluster identity token for Cluster Shared Volumes*.

This error is caused by a configuration error such as inability of the node to contact a domain controller, authentication issues, or the cluster IP address being incorrect. Fix these issues and the volume should be accessible.

Hyper-V live migration and quick migration fail after converting a CSV LUN to non-CSV

Hyper-V live migration and quick migration do not work after converting a cluster shared volume (CSV) LUN to a non-CSV LUN. You need to follow special procedures to convert a CSV to a non-CSV for successful live migration or quick migration.

When a LUN is used as a CSV, you cannot change the Windows drive letter of the virtual hard drive (VHD) to enable live migration or quick migration. Attempting live migration or quick migration with a CSV fails. If you simply remove the LUN from the CSV, the migration also fails.

Follow the special procedure for converting a CSV LUN to enable live and quick migrations.

Converting a Hyper-V CSV LUN to enable live and quick migration

Hyper-V live migration and quick migration do not work after cluster shared volume (CSV) LUNs have been converted to non-CSV. This procedure removes the LUN from the CSV and enables migration of the virtual machine.

Steps

1. Shut down the Hyper-V virtual machine (VM).
2. Export the VM configuration.

   The VM configuration information is copied. The virtual hard drive (VHD) is not copied.
3. Delete the VM from the Windows cluster and from Hyper-V.

   Note: Do not import the VM configuration until you are instructed to do so in step 5.
4. Remove the LUN from the CSV and assign an available Windows drive letter.
5. Import the VM you exported. In the VM settings, change the VHD location to point to the drive letter you assigned to the LUN.
6. Add the VM back as an HA resource.

Cannot add SCSI passthru disk to SUSE Hyper-V guest using IDE controller

If you add a SCSI passthru disk using the virtual IDE controller to a Hyper-V virtual machine running SLES 10 SP2, you cannot create a file system on the disk.

Disk commands such as `fdisk` also fail.

The problem has been observed in both clustered and non-clustered configurations.

The workaround is to use the virtual SCSI controller for passthru disks on SLES 10 virtual machines.

Uninstalling SP2 from SAN-booted Windows Server 2008 prevents host from booting

If you need to remove service pack 2 from a SAN-booted Windows Server 2008 host, remove MPIO first.

When SP2 is removed, the registry entries needed for successful SAN booting in an MPIO configuration are also removed. If you first remove MPIO, you can remove SP2 and still reboot the host successfully.

For more information, see the Microsoft support article.

Bidirectional CHAP limitation for Itanium hosts

The Microsoft iSCSI initiator cannot create more than one session using bidirectional (mutual) CHAP on Itanium hosts.

On Windows hosts with Itanium (IA64) processors, you cannot use bidirectional (mutual) CHAP with either multipath I/O (MPIO) or multiple connections per session (MCS). The first session or connection is established successfully, but you are unable to create additional sessions or connections.

This problem is fixed in Windows Server 2008 R2.

For earlier versions of Windows, do not use CHAP on IA64 systems if you want to create more than one iSCSI session.

Raw (passthru) disks on a guest OS are not available when running MPIO on the guest

If you run MPIO software on a guest OS (for iSCSI directly from the guest), and you also configure raw (passthru) disks as SCSI physical disks from the parent, the guest is unable to use the raw disks.

This issue occurs with the Data ONTAP DSM for Windows MPIO and the Veritas DMP DSM.

When you are running MPIO on the guest, map raw drives as IDE physical disks.

Guest OS install on SCSI disk fails

You cannot boot a Hyper-V virtual machine from a SCSI-mapped disk.

Use an IDE-mapped disk for the virtual machine boot disk.

Hyper-V virtual machine files do not work on CIFS share

You cannot use a CIFS share on the storage system to store the virtual hard disk (.vhd file) or virtual machine configuration files for a Hyper-V virtual machine.

Store the .vhd file and virtual machine configuration files on a FC or an iSCSI LUN mapped to a drive on the Hyper-V parent system.

Hyper-V guest does not boot or loses pass-through disk

If the disk numbers on the Hyper-V parent change so that they no longer match the virtual machine configuration, the guest operating system can fail to boot or the guest can lose access to a passthrough disk.

The disk number might change if you delete a LUN mapped to the parent and then reboot the parent.

You can fix the problem by modifying the virtual machine configuration to match the new disk identifiers.

SUSE Hyper-V guest loses network when moved to another cluster node

SUSE guest operating systems on Hyper-V systems lose their network connections when the guest is moved to another node in the Windows cluster.

The network loss occurs when the guest uses a dynamic MAC address for its virtual network adapters. Dynamic MAC addresses are the default setting.

The workaround is to always select a static MAC address in the virtual machine **Network Adapter** settings for SUSE guest operating systems.

This problem has been reported to Microsoft.

Configuration fails when attempting to add a virtual machine to a Failover Cluster

Adding a virtual machine to a failover cluster fails because the hidden available storage resource group belongs to a different node in the cluster.

Correcting a failed virtual machine addition

If adding a virtual machine to a failover cluster fails because the hidden available storage resource group belongs to a different node in the cluster, add the new virtual machine's disk to the correct resource group.

Steps

1. Move the disk to the proper node by using the Failover Cluster Management Console.
2. Add the disk to the proper resource group created by the Virtual Machine Resource Wizard.
3. Manually add a dependency of the Virtual Machine on the Virtual Machine Configuration files.
4. Add a dependency of the Virtual Machine Configuration Files on the Physical Disk.
5. Start the Virtual Machine Resource Group.

Ensuring virtual machines can be added to a failover cluster

To ensure new virtual machines can be added to a failover cluster, move the available storage group to the node on which you are creating and adding virtual machines.

Steps

1. On the cluster node, enter the following command at a Windows command prompt:

   `C:\cluster group "Available Storage" /move:"node_name"`

   node_name is the host name of the cluster node from which you are adding virtual machines.
2. Run the virtual machine wizard to create the virtual machines and then add them to the failover cluster.

Unable to add another virtual machine to a failover cluster

You can successfully add one virtual machine to a failover cluster, but attempts to add other virtual machines stored in the same LUN fail.

This problem applies only to configurations with more than one virtual machine (configuration files and boot .vhd file) stored on the same LUN.

Move all of the virtual machine resources to the same failover cluster resource group. Then add the virtual machines to the cluster. Be sure that the resources for all virtual machines are configured as dependent on the disk mapped to the LUN.

Virtual machine does not work after being removed from a failover cluster

A Hyper-V virtual machine no longer works after being removed from a failover cluster. Adding a virtual machine to a failover cluster and then removing it from the cluster removes the virtual machine configuration.

Recreate the virtual machine reusing the original boot .vhd file.

Unable to SAN boot with Emulex FC HBA

SAN booting might fail with Emulex Fibre Channel HBAs in one of several ways.

The following symptoms might occur while SAN booting a Windows host with an Emulex Fibre Channel HBA:

- The server boots once, but does not boot on subsequent attempts. The SAN boot is performed from a storage system LUN using FC. The HBA firmware is on the support matrix and the required storeport miniport driver is installed.
- After configuring the Emulex boot BIOS and rebooting the Windows host, the Emulex boot BIOS is not installed. The message `Emulex BIOS is not installed!!!` is displayed during the POST. This prevents configuring SAN booting.

Enable the `Start Unit Command` option in the Emulex HBA BIOS to resolve this issue.

Microsoft iSCSI SW Initiator takes a long time to reconnect to the storage system after disruption

In a storage system configuration with multiple physical networks or multiple VLANs, the Microsoft iSCSI software Initiator can take several minutes to reconnect to the storage system.

During initial target discovery (Add Target), the Microsoft iSCSI software initiator uses the iSCSI SendTargets command to retrieve a list of IP addresses at which the target can be accessed.

In a storage system configuration with multiple physical networks or multiple VLANs, it is possible that some of the storage system's addresses are not accessible to a given host. In this situation, the SendTargets response sent by the storage system will advertise some addresses which are not accessible by that host.

When the Microsoft iSCSI initiator loses connectivity to the target (such as during storage system reboot, takeover, and giveback), the initiator attempts to reestablish connectivity to the target using the following default algorithm, which Microsoft calls "port-hopping":

- Attempt to reconnect over the same IP address which was being used before the disruption.
- Cycle through the other IP addresses from the SendTargets response, attempting to reconnect, until connectivity is reestablished.

Each inaccessible IP address in the list can add a delay of 15-20 seconds, which is the TCP connection establishment timeout. If there are many inaccessible IP addresses in the list, it may take a long time for the iSCSI initiator to cycle through the list before successfully reconnecting to the target. If the total reconnect time exceeds the timeout configured on the host (PDORemovePeriod for MPIO), the Windows applications experience I/O errors.

This long reconnect time can be minimized by disabling the use of the Microsoft "port-hopping" algorithm by using a specific target IP address for each connection in the iSCSI Initiator.

Disabling the Microsoft iSCSI port-hopping algorithm

Disable the Microsoft iSCSI port-hopping algorithm in the iSCSI Initiator to minimize the recovery time in configurations with many iSCSI target ports.

Steps
1. Open the Microsoft iSCSI initiator applet and select the **Targets** tab.
2. Click **Log On**.
3. In the **Logon to target** dialog, click **Advanced**.
4. In the **Target Portal** list, change the value from Default to one of the storage system IP addresses specified in the **Target Portals** list on the **Discovery** tab.

After a disruption occurs, the Microsoft initiator uses only the IP address specified to reconnect to the storage system and does not try other IP addresses advertised in the SendTargets response.

Note: If the specified IP address is unreachable, no failover occurs.

LUN identifier range 0-254

The Windows operating system only recognizes LUNs with identifiers from 0 to 254, regardless of the number of LUNs mapped.

Be sure that your LUNs are mapped to identifiers in this range.

Wait between iSCSI logout and login

If you use the iSCSI software initiator GUI to log out the last session with an iSCSI target and then immediately log back in to the target, the Windows host does not connect to the iSCSI LUNs.

Wait at least 150 seconds after logging out of the last session with an iSCSI target before logging back in.

Fixed issues

The following known issues were fixed in this release of Data ONTAP DSM:

- In a Microsoft Cluster configuration, the cluster service cannot move and mount LUNs on nodes in the cluster, because SCSI reservations are stuck on a LUN path.
- The Data ONTAP DSM helper service, MPIOSvc.exe, experiences an application error and exits unexpectedly when other MPIO software is installed.
- The Data ONTAP DSM installer does not enforce the installation of Windows hotfix 982109 on Windows Server 2003 hosts.
- Data ONTAP DSM identifies paths from single-controller storage systems as Active/Non-optimized.

Websites

IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. The following web pages provide N series information:

- A listing of currently available N series products and features can be found at the following web page:

  www.ibm.com/storage/nas

- The IBM System Storage N series support website requires users to register in order to obtain access to N series support content on the web. To understand how the N series support web content is organized and navigated, and to access the N series support website, refer to the following publicly accessible web page:

  www.ibm.com/storage/support/nseries/

  This web page also provides links to AutoSupport information as well as other important N series product resources.

- IBM System Storage N series products attach to a variety of servers and operating systems. To determine the latest supported attachments, go to the IBM N series interoperability matrix at the following web page:

  www.ibm.com/systems/storage/network/interophome.html

- For the latest N series hardware product documentation, including planning, installation and setup, and hardware monitoring, service and diagnostics, see the IBM N series Information Center at the following web page:

  publib.boulder.ibm.com/infocenter/nasinfo/nseries/index.jsp

Where to find additional information

The following table describes documents with the most current information about host and storage system requirements and additional documentation.

If you want...	Go to...
The latest supported configurations	www.ibm.com/storage/support/nseries/
Configuring and managing the storage system	The following documents for your Data ONTAP release in the Data ONTAP information library: • The *Data ONTAP Software Setup Guide* • The *Data ONTAP Block Access Management Guide for iSCSI and FC* • *Data ONTAP Release Notes* • The *Data ONTAP Commands: Manual Page Reference, Volume 1* • The *Data ONTAP Commands: Manual Page Reference, Volume 2* • The *Data ONTAP Upgrade Guide*
Supported Fibre Channel SAN topologies	The *FC and iSCSI Configuration Guide*
Verifying storage systems and environments	*IBM System Storage N series Introduction and Planning Guide* or the *Hardware and Service Guide* for your N series system.
Configuring your host for the Host Utilities	The *HP-UX Host Utilities Installation and Setup Guide* The *Linux Host Utilities Installation and Setup Guide* The *AIX Host Utilities Installation and Setup Guide* The *Windows Host Utilities Installation and Setup Guide*

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