

HP OpenView Storage Mirroring—High availability for VMware GSX Server



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What is VMware?

VMware Virtual Center manages virtual infrastructures, which enables IT teams to continuously consolidate workloads for optimal savings on hardware and decreased operational costs. It enables system administrators to manage a higher number of servers. It delivers more flexibility and responsiveness in provisioning new software services and maintaining existing ones. Most importantly, it standardizes and simplifies the management of diverse x86-based environments across Microsoft® Windows®, Linux, and NetWare operating systems.

VMware GSX Server is virtual machine software for business-critical environments. It is ideal for server and application consolidation. HP OpenView Storage Mirroring provides near-synchronous enterprise data protection and replication and can be used to provide high availability for your VMware server.

This document describes the steps necessary to configure Storage Mirroring to provide high availability for Windows servers running VMware GSX Server. To complete the instructions, you will install VMware GSX Server and Storage Mirroring and configure Storage Mirroring for real-time replication and failover. Because of the complexities of these applications, this document is intended for network administrators with experience installing, configuring, and maintaining network applications, including Storage Mirroring and VMware.

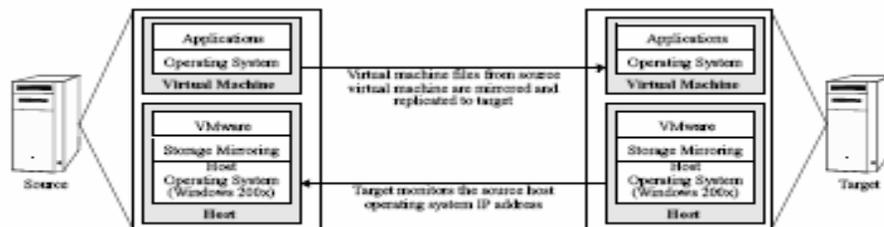
Requirements

- Two licensed copies of Microsoft Windows 200x
- Two licenses copies of VMware GSX Server 2.5.1
- Licensed copies of the operating systems and applications to be installed on the virtual machine
- Two licensed copies of Storage Mirroring

Configuration

This solution enables you to install Storage Mirroring on the host operating system on both the source and target. It provides you the ability to maintain an up-to-date backup of the virtual hard disk images from the virtual machines on the source. The target monitors the IP address of the host operating system on the source, and if it fails, the target can stand in for the failed source and the target virtual machine will be started.

Figure 1.



Installing and configuring software on the source

1. Install Storage Mirroring on the source using the installation defaults. Refer to the *HP OpenView Storage Mirroring Getting Started Guide* for details.
2. Install VMware on the source, if it is not already installed.
3. Reboot the server when prompted.
4. After the server has rebooted, create a virtual machine. For assistance, refer to your VMware reference guide.
5. Record the location of the virtual machine folder.

Virtual machine folder: _____

Note

If your virtual machine is already installed, look at the properties to determine the location of the virtual machine folders. By default, virtual machine folders are stored at %systemroot%\Documents and Settings\\my documents\my virtual machines\

6. Create a virtual disk. For assistance, refer to your VMware reference guide.
7. In VMware, register the virtual machine. For assistance, refer to your VMware reference guide.
8. Install the operating system and applications on the virtual machine on the source. For assistance, refer to your VMware reference guide.
9. Install the VMware tools on the virtual machine. For assistance, refer to your VMware reference guide.

Installing software on the target

1. Install Storage Mirroring on the target using the installation defaults. Refer to the *HP OpenView Storage Mirroring Getting Started Guide* for details.
2. Install VMware on the target.
3. Reboot the server when prompted.

Note

After Storage Mirroring has mirrored and replicated all of the data, you must configure the target.

Configuring mirroring and replication

1. Click **Start**, and select **Programs>Storage Mirroring>Management Console**.
2. Double-click your source to log on.
3. Right-click the source and select **Properties**.
4. On the Source tab, enable **Block Checksum All Files on a Difference Mirror**, and click **OK**.
5. Right-click your source and select **New>Replication Set**, and enter the desired name for the replication set.
6. Select the data to protect. This data includes the virtual machine folder recorded in step 5 in “Installing and configuring software on the source” on page 3.
7. Right-click the replication set name, and select **Save** to save the replication set.
8. Drag and drop the replication set onto the target. The Connection Manager dialog box opens. The Source Server, Target Server, Replication Set, and Route fields are automatically populated.
9. If you have multiple IP addresses on your target, verify the **Route** field is set to the correct network path. (For detailed information on connecting a source and target, refer to the *HP OpenView Storage Mirroring User Guide*.)
10. Select **One to One** to map the replication set data from the source to an identical volume/directory structure on the target.
11. Click **Connect** to start the mirror and replication processes.

Note

If you start the replicated virtual server on the target or if the associated data on the target is otherwise modified, the data on the source and target will no longer match. If the updated data on the target is not needed, perform a full or difference with block checksum mirror from the source to the target. If the updated data on the target is needed, restore the data from the target to the source.

Wait until mirroring is complete and the Mirror Status has changed to Idle before continuing with the next section, “Configuring the target.”

Configuring the target

After the mirror has completed, to configure the target:

1. Open the virtual machine on the target using the configuration file and virtual hard disk files that were replicated to the target in the previous steps.
2. In VMware, register the virtual machine that was just opened

Note

If you want to start this virtual machine to be sure that it works, you must first isolate it from the network.

Configuring failover and beginning failure monitoring

1. Click **Start**, and select **Programs>Storage Mirroring>Failover Control Center**.
2. Select the target from the list of available machines, and click **Login**. If the target you need is not displayed, click **Add Target**, enter the machine name, and click **OK**.
3. To add a monitor for the selected target, click **Add Monitor**. Enter the name of the source host server, and click **OK**. The Monitor Settings windows opens.
4. In the Monitor Settings window, mark the IP address that is going to fail over. This address is the physical address of the source host operating system.

5. Verify that Adding Source Identity to Target is selected.
6. Ensure all of the following settings are disabled:
 - Items to Failover—IP Address(s), Server Name, Share(s)
 - Use .SHR Share Mapping File
 - Active Directory—Failover Hostname
7. If a failure occurs, you will want to have the virtual machine start on the target automatically. To do this, create a batch file called postover.bat using the following batch file. Save the batch file to the same directory on the target where your Storage Mirroring files are installed.

POSTOVER.BAT

```
REM Sample post-failover script for VMware
REM You may need to modify the path to the VMware-cmd file to fit your
environment.
REM You will need to modify the path and name of the virtual machine.
REM The following command should appear as one line in your script
file. It is on two
REM lines here so that you can see the entire command.
"C:\Program Files\VMware\VMware VMperl Scripting API vmware-cmd"
"c:\Documents and
Settings\user_name\My Documents\my virtual
machines\machine_type_dir\machine_type.vmx" start
```

Note

Verify that the VMware GSX console window is not started on the target host server. If it is started and the target virtual machine is highlighted, the prefailover script will not start the virtual machine. Refer to the VMware documentation for more information.

8. After a failure is resolved, you will be ready to bring your source back online. Stop the virtual machine on the target automatically by creating a batch file called preback.bat using the following batch file. Save the batch file to the same directory on your target where your Storage Mirroring files are installed.

PREBACK.BAT

```
REM Sample pre-failback script for VMware
REM You may need to modify the path to the VMware-cmd file to fit your
environment.
REM You will need to modify the path and name of the virtual machine
REM The following command should appear as one line in your script
file. It is on two
REM lines here so that you can see the entire command.
"C:\Program Files\VMware\VMware VMperl Scripting API vmware-cmd"
"c:\Documents and Settings\
```

Note

VMware Tools (included with VMware) must be installed on the virtual machine for the `trysoft` option used in the `prefailback` script to work correctly. VMware tools can be installed from the Settings menu within the virtual machine. If VMware tools are not installed, the `soft` or `hard` commands can be substituted. However, they are not preferred because the `trysoft` option will first try to shut down the virtual machine gracefully, and only if it fails will it perform a hard shutdown.

9. On the Failover Control Center Monitor Settings dialog box, click **Scripts** and specify the post-failover (`postover.bat`) and prefailback (`preback.bat`) scripts that you just entered.
10. Click **OK** to go back to the Monitor Settings dialog box.
11. Click **OK** to begin monitoring the source machine.

In the event of a source failure, your target is now ready to stand in for the source. For information on monitoring failover, refer to the *HP OpenView Storage Mirroring User Guide*.

Restoring back to the original source

If your source experiences a failure, such as a power, network, or disk failure, the virtual machine on the target will stand in for the source while you resolve the source machine issues. To restore data to the original source:

1. Verify that your source machine is not connected to the network. If it is, disconnect it.
2. Resolve the source machine problem that caused the failure.

Note

If you must rebuild your hard drive, reinstall Windows and complete the instructions in "Installing and configuring software on the source" on page 3, using the same settings as originally used.

3. Click **Start**, and select **Programs>Storage Mirroring>Failover Control Center**.
4. Select the target machine that is currently standing in for the failed source.
5. Verify that the target machine is not running in Local Management mode. If it is, change it to Remote Management mode.
6. Select the failed source, and click **Failback**. The prefailback script created during the failover configuration executes, and the virtual machine on the target is stopped.
7. When you are prompted to determine if you want to continue monitoring the source server, do not select Continue or Stop at this time.
8. Connect the source machine to the network.
9. After the source is back online, select whether you want to continue monitoring this source machine by clicking **Continue** or **Stop**.

Note

Verify that the Storage Mirroring connection on the source has been disconnected (right-click the connection in the Storage Mirroring Management Console and select **Disconnect**).

10. To begin the restoration process, open the Storage Mirroring Management Console, and select **Tools>Restoration Manager**.
11. Complete the appropriate fields as described in the following list.
 - Original Source—The name of the source machine on which the data originally resided.
 - Restore From—The name of the target machine that contains the replicated data.
 - Replication Set—The name of the replication set to be restored.
 - Restore To—The name of the machine to which the data will be restored. This machine might not be the same as the original source machine.
12. Identify the correct drive mappings for the data and any other restoration options necessary. For detailed information on the restoration options, refer to the *HP OpenView Storage Mirroring User Guide*.
13. Verify that the selections you have made are correct, and click **Restore**. The restoration procedure time varies depending on the amount of data that you must restore.
14. After the restoration is complete, reestablish the replication set connection. For more information, see “Configuring mirroring and replication” on page 4.

At this time, your data is restored back to your source machine, and if you selected to continue failover monitoring, the target is available to stand in for the source in the event of a failure.

Alternate configuration for disaster recovery

If you are only interested in disaster recovery and do not need high availability, you might want to consider the following configuration.

Caution

This configuration has not gone through extensive testing and is only provided as a guideline for identifying another solution which may be possible using OVSM and VMware.

If you only want to install VMware on the source, you can still protect the virtual hard disk images from the virtual machines. In this configuration, Storage Mirroring is installed on the source host operating system. The replication set from the source virtual machine is backed up on the target. The target does not contain any virtual machines. Because VMware is not installed on the target, this configuration does not support high availability, but in the event of a failure on the source, all of your data will be protected on the target.

Figure 2.



Alternate configuration for high availability

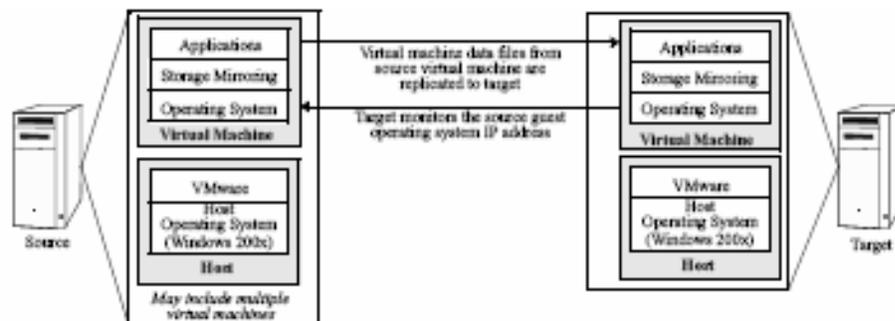
If you want to protect only your virtual machine data files, you might want to consider this alternate high-availability configuration.

Caution

This configuration has not gone through extensive testing and is only provided as a guideline for identifying another solution that might be possible using Storage Mirroring and VMware.

By installing Storage Mirroring on the virtual machines on the source and target, you can provide high availability for the virtual machine data files. This configuration requires a licensed copy of Storage Mirroring for each virtual machine. With this configuration, Storage Mirroring provides a backup copy of user-selected data from the virtual hard disk images from the virtual machines on the source. The target monitors the IP address of the virtual machine on the source, and if it fails, the target can stand in for the failed virtual machine.

Figure 3.



For more information

HP OpenView Storage Mirroring

<http://h18006.www1.hp.com/products/storage/software/sm/index.html>

Call to action

To download an evaluation version of HP OpenView Storage Mirroring, visit

http://www.openview.hp.com/products/mirror/tc_mirror_0001.html.

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