

Veritas Storage Foundation™ and High Availability Solutions Release Notes

Windows Server 2008

5.1 SP1 Application Pack 1



Veritas Storage Foundation and High Availability Solutions Release Notes for SP1 AP1

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Product version: 5.1. Service Pack 1 Application Pack 1

Document version: 5.1.SP1AP1.0

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- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information

- Problem description:
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Introduction

This document provides important information about Application Pack 1 for

- Veritas Storage Foundation™ 5.1 SP1 for Windows (SFW)
- Veritas Storage Foundation™ HA 5.1 SP1 for Windows (SFW HA).

Please review this entire document before using Application Pack 1 for SFW 5.1 SP1 or SFW HA 5.1 SP1.

General information regarding Veritas Storage Foundation and High Availability Solutions for Windows is available on the Symantec website.

<http://www.symantec.com>

For the latest version of this document, see the *Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Application Pack 1 Release Notes* at:

<http://seer.entsupport.symantec.com/docs/306318>

For the latest information on supported software, see the Software Compatibility list at:

<http://entsupport.symantec.com/docs/337682>

For the latest updates to array support and for supported hardware configurations, see the Hardware Compatibility list at

<http://entsupport.symantec.com/docs/337683>

New features and changes in this release

This section describes the changes introduced in Veritas Storage Foundation for Windows (SFW) and Veritas Storage Foundation HA for Windows version 5.1 SP1 (SFW HA) Application Pack 1.

New features available in Veritas Storage Foundation for Windows and Storage Foundation HA for Windows version 5.1 SP1 are described in the *Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Release Notes*.

New application version support

This release provides support for the following new application versions:

- Microsoft Exchange Server 2010:
 - SFW supports VSS-based backup and restore operations with Exchange Server 2010.
 - SFW HA supports HA and DR configurations for Exchange Server 2010. Refer to the *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange 2010* to configure a new HA and DR environment for Exchange 2010.
- Oracle 11g on Windows Server 2003 and 2008 (x86 and x64)

Note: SFW HA 5.1 SP1 Application Pack 1 does not support Oracle 11g on Windows Server 2008 R2.

For additional detailed application version support information, see “[Software support](#)” on page 12.

Requirements

Review these product installation requirements before installing Veritas Storage Foundation 5.1 SP1 for Windows Application Pack 1.

For the latest information on supported software, see the Software Compatibility list at:

<http://entsupport.symantec.com/docs/337682>

Application Pack 1 can only be applied to an existing installation of SFW 5.1 or SFW 5.1 HA SP1. For SFW 5.1 and SFW 5.1 HA SP1 installation requirements and operating system requirements, see the *Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Installation and Upgrade Guide*.

Software support

In addition to applications supported by SFW 5.1 SP1 and SFW HA 5.1 SP1, this Application Pack 1 release includes new support for following applications:

- Microsoft Exchange Server 2010
- Oracle 11g

For information about SFW 5.1 SP1 and SFW HA 5.1 SP1 supported applications, see the *Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Installation and Upgrade Guide*.

Microsoft Exchange Server

Table 1-1 lists the new supported Microsoft Exchange Server editions and operating systems for this Application Pack 1 release. Note that all systems must be running the same operating system.

Table 1-1 Microsoft Exchange Server 2010 and Windows Server support

Application	Windows Server
Microsoft Exchange Server 2010 (Standard or Enterprise Edition)	<ul style="list-style-type: none"> ■ Microsoft Windows 2008 x64, Service Pack 1 ■ Microsoft Windows 2008 x64, Service Pack 2 ■ Microsoft Windows 2008 x64 R2

Microsoft Exchange Server 2003, Microsoft Exchange Server 2007, and Microsoft Exchange Server 2010 can exist in the same cluster and operate on or fail over to the same systems. However, only one default instance can exist on a system at one time. Additional instances that operate on or fail over to that

system must be named instances. The number of named instances is limited only by the normal limit of instances for that version of Exchange Server.

Oracle

[Table 1-2](#) lists the new supported Oracle versions and operating systems for this Application Pack 1 release. Note that all systems must be running the same operating system.

Table 1-2 Oracle and Windows Server support

Application	Windows Server
Oracle 11g (11.1.0.7.0)	Windows Server 2008 x86, x64
Oracle 11g (11.1.0.6.0)	Windows Server 2003 x86, x64

Note: SFW HA 5.1 SP1 Application Pack 1 does not support Oracle 11g on Windows Server 2008 R2.

Installing Application Pack 1

This section provides information related to upgrading to the application pack. Application Pack 1 can only be applied to an existing installation of SFW 5.1 SP1 or SFW HA 5.1 SP1. The SFW HA-specific tasks described in this application pack release notes presume that you have already configured a VCS cluster and created service groups in the SFW HA environment.

If you have not configured the VCS cluster, Symantec recommends that you first configure the cluster and then proceed with the steps described here. You can use the VCS Cluster Configuration Wizard (VCW) for cluster configuration. Refer to the *Veritas Cluster Server Administrator's Guide* for detailed steps.

Note: You are not required to install Microsoft Exchange Server 2010 on your system before installing SFW HA 5.1 SP1 AP1. You can install SFW HA 5.1 SP1 AP1 before or after you install Microsoft Exchange Server 2010 on your system. Refer to your Microsoft Exchange Server documentation or the Microsoft support website for information about the process for migrating from Microsoft Exchange Server 2007 to Microsoft Exchange Server 2010.

Read the following topics:

- See [“Download locations”](#) on page 15.
- See [“Preparing to install the application pack”](#) on page 16.
- See [“Installing Application Pack 1 using the GUI”](#) on page 19.
- See [“Installing Application Pack 1 using the command line”](#) on page 23.
- See [“Tasks after installing Application Pack 1”](#) on page 24.

Download locations

Download the packages for this release from the following locations:

Table 1-3 Application Pack 1 download paths

To install	Download packages from
SFW HA 5.1 SP1 Application Pack 1 (64-bit)	http://entsupport.symantec.com/docs/315676

Preparing to install the application pack

Ensure the following before installing the application pack:

- In case of a VCS cluster environment, Symantec recommends that you configure the VCS cluster, if not configured already. You can use the VCS Cluster Configuration Wizard (VCW) for cluster configuration. Refer to the *Veritas Cluster Server Administrator's Guide* for detailed steps.
- Make sure that you back up all your data.
- Make sure you back up the system state.
- Ensure that you have network access to each remote computer.
- Test the system after each upgrade, especially after applying other product upgrades. An incremental upgrade eases the troubleshooting process.

Preparing a VVR environment

If you have VVR to replicate data from a primary site to a secondary site, use the following procedures to stop the replication. For additional information, refer to the *Veritas Volume Replicator 5.1 Administrator's Guide*.

Note: For VVR environments with multiple secondary sites, any operations that need to be performed at a secondary site must be repeated on all secondary sites.

Read the following topics:

- For VVR sites without a cluster (VCS or Microsoft Clustering), complete these steps.
See [“Preparing a non-clustered VVR environment”](#) on page 17.
- For sites with VVR and a cluster (either VCS or Microsoft Clustering), complete these steps.
 - See [“Preparing an SFW HA environment”](#) on page 18.
 - See [“Preparing a Microsoft Clustering environment”](#) on page 17.

Preparing a non-clustered VVR environment

To prepare the sites from the VEA GUI in a non-clustered environment

- 1 On the primary site, stop the application that uses VVR to replicate data between the sites.
- 2 Select the primary RVG, right-click and select **Disable Data Access** from the menu.
- 3 Select the secondary RVG, right-click and select **Disable Data Access** from the menu.

To prepare the sites from the command line in a non-clustered environment

- 1 On the primary site, stop the application that uses VVR to replicate data between the sites.
- 2 On the primary site, disable data access to the volumes using the `vrxvg` command. Type the following command at the command prompt:

```
vrxvg -g diskgroup_name stop rvg_name
```
- 3 On the secondary site, disable data access to the volumes using the `vrxvg` command. Type the following command at the command prompt:

```
vrxvg -g diskgroup_name stop rvg_name
```

Preparing a DMP environment

If you have a previous installation of DMP on your system, disconnecting DMP paths should not be necessary for this application pack update. Always back up your data before upgrading.

For instructions about disconnecting DMP paths, refer to the *Veritas Storage Solutions 5.1 for Windows Installation and Upgrade Guide*.

Preparing a Microsoft Clustering environment

Before installing the application pack in a Microsoft Clustering environment, make sure that Microsoft Clustering is running on the cluster.

Install the application pack on the inactive node or nodes of the cluster first, then use the `Move Group` command in Microsoft Clustering to move the active node. Install the application pack on the cluster's remaining node. Refer to the *Veritas Storage Solutions 5.1 for Windows Installation and Upgrade Guide*, and the Microsoft Clustering chapter in the *Veritas Storage Foundation 5.1 for Windows Administrator's Guide* for more information about the `Move Group` command.

Preparing an SFW HA environment

The preparation tasks described here presume that you have already configured a VCS cluster and created service groups in the SFW HA environment.

To prepare the sites in a VCS environment

- 1 On the primary site, take offline the service group for the application that uses VVR to replicate data between the sites.
- 2 On the primary site, take the RVG service group offline.
- 3 On the secondary site, take the RVG service group offline.
- 4 Complete the following procedures:
 - See “[Removing VCS Management Console](#)” on page 18.
 - See “[Saving and closing the cluster configuration](#)” on page 18.

Removing VCS Management Console

If one or more nodes in the cluster have Veritas Cluster Server Management Console 5.1 installed, you must remove the management console before installing the application pack.

To remove VCS Management Console 5.1

- 1 Stop the VCS Management Console. If the management console is clustered, take the CMC_MS service group offline.
- 2 Back up the console’s data directory and datadir.conf files.
Typically, the files are located at the following paths:
 - C:\Program Files\Symantec\VRTScmcm
 - or
 - C:\Program Files(x86)\Symantec\VRTScmcm
- 3 Remove VCS Management Console 5.1 from all nodes in the cluster using Windows Add/Remove Programs.
You can reinstall the management console later, after the upgrade.

Saving and closing the cluster configuration

Use the VCS Cluster Manager (Java Console) to save and close the configuration. This operation involves saving the latest configuration to disk and changing the configuration state to read-only mode. You must also bring the service groups offline and stop VCS before installing the application pack.

To save and close the configuration

- ◆ From the VCS Cluster Manager (Java Console), click **File > Save** and **File > Close Configuration** on the Cluster Explorer toolbar.

To bring the service groups offline

- ◆ From the VCS Cluster Manager (Java Console), right-click the service group and then click **Offline**.

or

From the command prompt, type:

```
hagrp -offline group_name -sys system_name
```

where *group_name* is the name of the service group and *system_name* is the node on which the group is online.

Repeat this for all service groups that are online.

To stop the VCS High Availability Engine (HAD)

- ◆ Stop HAD on all the cluster nodes that you wish to upgrade.

Type the following at command prompt:

```
hastop -all -force
```

Installing Application Pack 1 using the GUI

The following procedure describes the procedure for installing the application pack using the GUI.

Note: When installing the Application Pack 1 as described below, click **Run Configuration Checker** if you wish to run the configuration checker wizard to verify the configuration. Refer to the *Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Installation and Upgrade Guide* for more information about the configuration checker tool.

To install Application Pack 1 using the GUI

- 1 Insert the DVD containing the installation software into your system's disc drive or download the installation software from the Symantec support page on the Symantec Web site.
See "[Download locations](#)" on page 15.
- 2 Allow the autorun feature to start the installation or double-click **Setup.exe**.
- 3 The Veritas Storage Foundation for Windows 5.1 SP1 AP1 Installer screen appears. Review the options on this screen, and select **Product Installation > 5.1 SP1 AP1 Installer**.

Additional options on this screen include:

- Links to product documentation
- Link to Symantec technical support

- 4 The 5.1 SP1 Application Pack 1 Installer Welcome screen appears. The Application Pack 1 Installer is designed for:
 - Veritas Storage Foundation 5.1 SP1
 - Veritas Storage Foundation and High Availability 5.1 SP1
 - Veritas Cluster Server 5.1 SP1Read the prerequisites for the install and click **Next**.
- 5 The Symantec Software License Agreement screen appears next. Read the terms of the license agreement.
Click the “I accept the terms of License Agreement” radio button and click **Next**.
- 6 The Option Selection screen appears next. Check the individual boxes to install the selected features on your system for Application Pack 1 for Service Pack 1 of SFW 5.1, SFW HA 5.1, and VCS 5.1 for Windows.
Click **Next**.
- 7 In the System Selection screen that appears next, either enter a system name in the field at the top of the screen and click the **Add** button, or click the **Browse** button to locate the system for the install and then click the **Add** button. You can enter multiple systems for installation using this screen view.
After the system or systems appears in the view, Click **Next**.
- 8 After entering a system or systems and clicking **Next**, a verification process is performed on the system or systems.
In the System field, the system name appears. In the Status field, a “Verification failed” message appears if the verification fails. If the verification is successful, a “Ready for install” message appears.
Clicking on the blue “i” button provides information about the verification; clicking the red “x” button removes the system from the installation list.
Clicking the folder icon permits you to choose another directory for the installation.
Clicking the **Re-verify** button, starts another system verification.

Note: If your systems are not verified for installation, you will not be able to proceed.

Click **Next** after verification, and the “Ready for install” message appears in the Status field.

- 9 The Pre-install Summary screen appears next. Review the information in this view prior to proceeding. The following information is listed in the summary report:
 - Start time for the installation and log file location

- Selected Solutions for the install
- Selected Systems for the install including:
 - Operating system
 - Domain name
 - Installation path
 - Free space in System drive
- Installed Solutions for the install including:
 - Client components
 - Server components
- Installed Options for the install including:
 - Symantec Trusted Software Publisher Certificate
 - Replace Disk Management Snap-in with SFW VEA GUI for Windows Server 2008
 - Product documentation
 - Supported DMP DSMs
 - FlashSnap
 - Cluster Option for MSCS/Failover Cluster
 - Volume Replicator (VVR)
 - VxCache

Click the **Save Report** button to access a Save Webpage screen. You can then save an .htm, html file format report of this information.

Click **Next** to proceed with the installation.

- 10 After clicking **Next**, the 5.1 SP1 Application Pack Installation screen appears. You view the installation progress from this screen. When the installation is finished, the following information is displayed:
 - A message appears in the Status field that the “Operation completed successfully.”
 - The In Progress field displays the total number of successful system installations.
 - The progress bar displays Overall Progress at 100%.Click **Next** after receiving an “Operation completed successfully” message.
- 11 A Post-install Summary screen displays next. Review the information in this view prior to proceeding. The following information is listed in the Post-install Report:
 - Start time for the installation and log file location
 - Selected Solutions for the install

- Selected Systems for the install including:
 - Install Status
 - Operating system
 - Domain name
 - Installation path
- Installed Solutions for the install including:
 - Client components
 - Server components
- Installed Options for the install including:
 - Symantec Trusted Software Publisher Certificate
 - Replace Disk Management Snap-in with SFW VEA GUI for Windows Server 2008
 - Product documentation
 - Supported DMP DSMs
 - FlashSnap
 - Cluster Option for MSCS/Failover Cluster
 - Volume Replicator (VVR)
 - VxCache
- Detailed Install Status
 - Pre-install Operations
 - Install Operations

Click the **Save Report** button to access a Save Webpage screen. You can then save an .htm, html file format report of this information.

Click **Next** to proceed with the installation.

- 12 Review the Finish screen message and click **Next**.

Installing Application Pack 1 using the command line

Download the Application Pack 1 installation files from the Symantec support page on the Symantec Web site.

See “[Download locations](#)” on page 15.

You can perform a silent installation of Application Pack 1 using the Setup.exe command from command line. With a silent installation, you can only install on one computer at a time.

Note: For Windows Server 2008, all CLI commands must run in the command window in the “run as administrator” mode.

To install Application Pack 1 using the command line

- 1 Click **Start > Run**, type **cmd** and then click **OK** to open the command prompt.
- 2 From the command prompt, navigate to the location where you have copied the application pack installation files.
- 3 To install Application Pack 1, type the following command at the command prompt:

```
Setup.exe /s INSTALL_MODE=<InstallMode>
SOLUTIONS=<SolutionID> NODE=<nodename> options=<Option
ID>
```

[Table 1-4](#) describes the values that the parameters can take.

Table 1-4 Setup.exe: Silent install parameters

Parameter	Usage
/s	Set for silent mode. If not entered, the product installer GUI starts.
Install_Mode	Set to indicate an installation or uninstallation. 1 = To install or upgrade the product 5 = To uninstall the product The installer automatically detects whether it is a fresh install or an upgrade and performs the necessary tasks accordingly. The default value is 1. Example: INSTALL_MODE=1
Solutions	Set this value to 5 for Application Pack 1
Node	Set the node name. Specify only one node at a time. The default setting is the local node. Example: Node=SysA

Table 1-4 Setup.exe: Silent install parameters (Continued)

Parameter	Usage
options	<p>Option to select a feature to be installed. This can take the following values:</p> <ul style="list-style-type: none"> ■ Exchange2010 (Exchange 2010 feature) ■ NTAP60 (NetApp Snapdrive 6.0 feature) <p>This option is not applicable for SFW or SFW HA installations. You can choose either or both options. When using both options they must be separated by a comma. Enclose the options in double quotes. Example: Option Id="Exchange2010,NTAP60"</p>

Silent installation example: Local Server

This command installs the application pack on the local node. The application pack is installed to the same directory as the 5.1 base installation.

```
Setup.exe /s INSTALL_MODE=1 SOLUTIONS=5
options="Exchange2010"
```

Silent installation example: Remote Server

This command installs the application pack on a remote node. It states that the node it is installing is SysA. The application pack is installed to the same directory as the 5.1 base installation.

```
Setup.exe /s INSTALL_MODE=1 SOLUTIONS=5 NODE=SysA
options="Exchange2010"
```

Tasks after installing Application Pack 1

Tasks after installing the application pack may include the following depending on the environment at the site:

- See [“Re-installing VCS Management Console 5.1”](#) on page 24.
- See [“Re-enabling VVR after the update”](#) on page 25.
- See [“Re-enabling VCS resources after the update”](#) on page 28.
- See [“Re-enabling DMP after the update”](#) on page 28.

Re-installing VCS Management Console 5.1

To re-install VCS Management Console

- 1 Install VCS Management Console 5.1.

Refer to the *Veritas Cluster Server Management Console Implementation Guide*.

- 2 Restore the backed-up VCS Management Console 5.1 data files. These are the files that you had backed-up before installing the application pack. See [“Removing VCS Management Console”](#) on page 18.
- 3 Start the VCS Management Console. If the management console is clustered, bring the CMC_MS service group online.

Re-enabling VVR after the update

After upgrading an environment where VVR replicates data from a primary site to a secondary site, use the following procedures to begin replication.

Note: For a VVR environment with multiple secondary sites, any operation that needs to be performed on a secondary site must be repeated on all other secondary sites.

Read the following topics:

- For sites with VVR and VCS cluster, re-enable VVR before preparing the cluster.
See [“Re-enabling VVR in a VCS cluster environment after the update”](#) on page 25.
- For sites without a cluster, complete these steps.
See [“Re-enabling VVR in an environment without clusters”](#) on page 26.

Re-enabling VVR in a VCS cluster environment after the update

To enable the updated objects from the VCS Cluster Manager (Java Console)

- 1 On the primary site, bring the RVG service group online.
From the VCS Cluster Manager (Java Console), right-click the RVG service group and select **Online**.
- 2 On the secondary site, bring the RVG service group online.
From the VCS Cluster Manager (Java Console), right-click the RVG service group and select **Online**.
- 3 On the primary site, bring the application service group online.
From the VCS Cluster Manager (Java Console), right-click the application service group and select **Online**.

- 4 If bringing the service groups online does not start the application, perform any necessary tasks to start the application. Depending on options available in your environment, these tasks may include mounting databases or manually starting the application.

To enable the updated objects from the command line

- 1 Click **Start > Run**, type **cmd** and then click **OK** to open the command prompt.
- 2 On the primary site, run the hagrps command to bring the RVG service group online. Type the following command at the command prompt:

```
hagrps -online group_name -sys system_name
```
- 3 On the secondary site, run the hagrps command to bring the RVG service group online. Type the following at the command prompt:

```
hagrps -online group_name -sys system_name
```
- 4 On the primary site, run the hagrps command to bring the application service group online. Type the following at the command prompt:

```
hagrps -online group_name -sys system_name
```
- 5 If bringing the service groups online does not start the application, perform any necessary tasks to start the application. Depending on the options available in your environment, these tasks may include mounting databases or manually starting the application.

Re-enabling VVR in an environment without clusters

To enable the updated objects from VEA

- 1 Select the primary RVG, right-click, and select the **Enable Data Access** option from the menu.
- 2 Select the secondary RVG, right-click, and select the **Enable Data Access** option from the menu.
- 3 If needed, perform any necessary tasks to start the application. Depending on the options available in your environment, these tasks may include mounting databases or manually starting the application.

To enable the updated objects from the command line

- 1 Click **Start > Run**, type **cmd** and then click **OK** to open the command prompt.
- 2 On the secondary site, enable data access to the volumes under RVG using the vxrvgs command. Type the following at the command prompt:

```
vxrvgs -g diskgroup start rvg_name
```
- 3 On the primary site, enable data access to the volumes under RVG using the vxrvgs command. Type the following at the command prompt:

```
vxrvg -g diskgroup start rvg_name
```

- 4 If needed, perform any necessary tasks to start the application. Depending on the options available in your environment, these tasks may include mounting databases or manually starting the application.

Re-enabling VCS resources after the update

Ensure that all service groups that were taken offline prior to the update are brought online again, in the appropriate order based on resource dependencies.

To bring a service group online

- 1 Bring a service group online, in the appropriate order based on resource dependencies.
 - From the VCS Cluster Manager (Java Console), right-click the service group and click **Online**.
or
 - From the command prompt, type:

```
hagrp -online group_name -sys system_name
```

where *group_name* is the name of the service group and *system_name* is the node on which the group is online.
- 2 Repeat for additional service groups.

Re-enabling DMP after the update

If you have disconnected DMP paths, you can reconnect them. For instructions about reconnecting DMP paths, refer to the *Veritas Storage Solutions 5.1 for Windows Installation and Upgrade Guide*.

Migrating the mailbox database for Exchange 2007

This section describes the procedure for migrating the mailbox database from an existing server running Microsoft Exchange Server 2007 to a new server running Microsoft Exchange Server 2010.

This procedure is only required if your existing server running Exchange Server 2007 is under VCS control and you enabled detailed monitoring with Exchange 2007.

You must disable detailed monitoring of the mailbox database, before moving the mailbox database to the new server running Microsoft Exchange Server 2010.

Migrating the mailbox database for Exchange 2007

- 1 TBD
- 2 TBD

Upgrading an Oracle cluster

This section describes the tasks required for upgrading from earlier SFW HA versions to SFW HA 5.1 SP1 Application Pack 1 for an Oracle cluster.

[Table 1-5](#) presents the supported Oracle cluster upgrade paths.

Table 1-5 Oracle cluster upgrade paths

Upgrade from this configuration ...	To this configuration ...
<ul style="list-style-type: none"> ■ SFW HA 5.1 ■ Oracle 10g ■ Windows Server 2003 x86 	<ul style="list-style-type: none"> ■ SFW HA 5.1 SP1 AP1 ■ Oracle 11g (11.1.0.6.0) ■ Windows Server 2003 x86
<ul style="list-style-type: none"> ■ SFW HA 5.1 ■ Oracle 10g ■ Windows Server 2003 X64 	<ul style="list-style-type: none"> ■ SFW HA 5.1 SP1 AP1 ■ Oracle 11g (11.1.0.6.0) ■ Windows Server 2003 x64
<ul style="list-style-type: none"> ■ SFW HA 5.1 SP1 ■ Oracle 10g ■ Windows Server 2008 x86 	<ul style="list-style-type: none"> ■ SFW HA 5.1 SP1 AP1 ■ Oracle 11g (11.1.0.7.0) ■ Windows Server 2008 x86
<ul style="list-style-type: none"> ■ SFW HA 5.1 SP1 ■ Oracle 10g ■ Windows Server 2008 x64 	<ul style="list-style-type: none"> ■ SFW HA 5.1 SP1 AP1 ■ Oracle 11g (11.1.0.7.0) ■ Windows Server 2008 x64

Depending on your current configuration and upgrade scenario, the upgrade process involves one or both of the following procedures:

- Upgrading VCS and the VCS database agent for Oracle
- Upgrading Oracle

Upgrading SFW HA

Perform the following tasks to upgrade to SFW HA 5.1:

- Prepare the cluster for an upgrade: [“Preparing an SFW HA environment”](#) on page 18
- Upgrade SFW HA and the database agent for Oracle from version 5.1 SP1 to 5.1 SP1 AP1: [“Installing Application Pack 1 using the GUI”](#) on page 19

Upgrading Oracle in a VCS cluster

This section describes the tasks necessary to upgrade Oracle in a VCS cluster. Refer to your Oracle documentation for information on supported Oracle upgrade paths and specific procedures.

Upgrading the Oracle application

Upgrading Oracle involves the following steps:

- Upgrading the Oracle binaries.
- Upgrading the Oracle database. Perform the following tasks before upgrading the Oracle database:
 - Bring the Oracle service group online.
 - Stop HAD using the `hastop -local -force` command.

Additional tasks after upgrading Oracle

Perform the following tasks to configure Oracle in a VCS environment.

- Associate the updated database with the listener for Oracle.
See “[Associating the updated database with the listener](#)” on page 31.
- Configure the database and listener to use the virtual IP address.
See “[Configuring the database and listener to use the virtual IP address](#)” on page 32.
- Configure Oracle and listener services.
See “[Configuring Oracle and listener services](#)” on page 34.
- Modify the ServiceName attribute for the Netlsnr resource.
See “[Modifying the ServiceName attribute for the netlsnr resource](#)” on page 35.

Associating the updated database with the listener

Use these instructions to associate all the databases with the listeners.

Prerequisite

Ensure that the initialization parameter file contains the following entries:

- SERVICE_NAMES (the name of the database service)
- INSTANCE_NAME (the name of the database instance)

These parameters are created during installation or database creation.

To associate the database with the listener

- 1 Use one of the following ways to configure the new attribute listener_alias:
Run the following SQL command:

```
SQL> ALTER SYSTEM SET LOCAL_LISTENER='<listener_alias>'  
scope=spfile;  
OR
```

Add the following entry to the initialization parameter file (pfile/spfile):

```
LOCAL_LISTENER = <listener_alias>
```

- 2 Define the parameter listener_alias. If your Oracle configuration uses the file tnsnames.ora, edit the file as instructed below. The default location of tnsnames.ora is %ORACLE_HOME%\NETWORK\ADMIN.

Add the following to tnsnames.ora file:

```
<listener_alias>=  
(DESCRIPTION =  
(ADDRESS=(Protocol=TCP) (HOST=virtual_IP_address) (Port=1521))  
)
```

- 3 Stop and restart the database.

The listener_alias parameter gets appended by the default domain name specified in the file sqlnet.ora.

Configuring the database and listener to use the virtual IP address

All databases and listeners configured *must* use the same virtual IP. Update the Oracle files to set the virtual IP address. Setting the virtual IP address involves the following tasks:

- Creating a virtual IP address.
- Verifying the initialization file settings.
- Updating the Oracle configuration files.

Use the following steps to configure the database and listener.

To create a virtual IP address

- 1 Open the **Network Connections (Start > Settings > Network Connections)**.
- 2 Right-click the public network connection to be used and click **Properties**.
- 3 Select **Internet Protocol (TCP/IP)** and click **Properties**.
- 4 Click **Advanced**.
- 5 In the **IP Settings** tab, click **Add** to add a virtual IP address and subnet mask.

To verify the initialization file settings, if a PFILE is used

- 1 Open the Registry Editor.
From the **Start** menu, choose **Run**. In the **Open** field, enter **regedit** and click **OK**.
- 2 Double-click the `ORA_SID_PFILE` registry key at `HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME_ID\`.
The variable `SID` represents the database instance.
- 3 Verify that the Value data field specifies the correct path at which the initialization file, `init.ora`, is located.

To verify the initialization file settings, if an SPFILE is used

- 1 Run `sqlplus.exe`.
- 2 Connect to the database.
- 3 Verify the following query returns the correct path of the SPFILE.

```
select value from v$parameter where name = 'spfile'
```

To update the Oracle configuration files

- 1 In the `listener.ora` and `tnsnames.ora` files, change the host name for all the TCP protocol address databases to the virtual IP address that you created.
Replace
`HOSTNAME=machine_name`
with
`HOSTNAME=virtual_IP_address`
- 2 In the initialization file, change the dispatchers parameter.
Oracle requires an initialization file, a PFILE or an SPFILE, to start database instances. Choose the appropriate reference depending on the initialization file you use.
See [“Setting the dispatchers parameter in PFILE”](#) on page 33
See [“Setting the dispatchers parameter in SPFILE”](#) on page 34.
- 3 Restart the Oracle and listener services.

Setting the dispatchers parameter in PFILE

In the PFILE, set the host name for all TCP protocol address dispatchers to the virtual IP address that you created.

Edit the dispatchers parameter *only* for the host name and leave the rest of the configuration as it is. Set the value as:

```
dispatchers = '(ADDRESS = (Protocol=TCP)  
(HOST=virtual_IP_address) (any other previously existing  
entry))'
```

The variable *virtual_IP_address* represents the virtual IP address that you created.

For example:

```
dispatchers = '(ADDRESS = (Protocol=TCP) (HOST=10.210.100.110)
(SERVICE=Data1XDB) '
```

Setting the dispatchers parameter in SPFILE

Use the following steps to set the dispatchers parameter in SPFILE.

To set the dispatchers parameter in SPFILE

- 1 Convert the SPFILE to PFILE.
- 2 Modify the PFILE.
See “[Setting the dispatchers parameter in PFILE](#)” on page 33.
- 3 Convert the PFILE to SPFILE.
- 4 Save the SPFILE to the original location on the shared disk.
Refer to the Oracle documentation for specific information on converting a PFILE or an SPFILE.

Configuring Oracle and listener services

Configuring the Oracle and Listener services involves the following tasks:

- Making the Oracle and Netlsnr services manual.
- Configuring log on properties for Oracle services.

Use the following steps to configure Oracle and listener services.

To make services manual

- 1 Open the **Services** applet (**Start > Programs > Administrative Tools > Services**).
- 2 Double-click the service. In the SCM:
 - Oracle services appear as OracleService*SID*, where *SID* represents the database instance.
 - Listener services appear as Oracle*Ora_Home*TNS*ListenerName*, where *Ora_Home* represents the Oracle home directory and *ListenerName* is the name of the listener set during the installation.
- 3 In the **Properties** window, click the **General** tab.
- 4 From the **Startup Type** drop-down list, select **Manual**.
- 5 Click **OK**.

To configure the log on properties for oracle services

- 1 Open the **Services** applet (**Start > Programs > Administrative Tools > Services**).
- 2 Double-click the Oracle service. In the SCM, the names of Oracle services appear as OracleService*SID*, where *SID* represents the database instance.
- 3 In the **General** tab of the **Properties** window, click **Stop** to stop the service.
- 4 Click the **Log On** tab.
- 5 Choose **This Account**.
- 6 Enter the credentials of the user in whose context Oracle was installed.
- 7 Click the **General** tab and click **Start** to start the service with the new Log On properties. Click **OK**.

Modifying the ServiceName attribute for the netlsnr resource

Perform the following steps to modify the ServiceName attribute for the Netlsnr resource.

To modify the ServiceName attribute

- 1 Start HAD. Type the following on the command prompt:
`C:\> hastart`
- 2 Offline the Netlsnr resource. Type the following on the command prompt:
`C:\> hares -offline resource_name -sys system_name`
- 3 Modify the ServiceName attribute for the Netlsnr resource. Type the following on the command prompt:
`C:\> hares -modify resource_name attribute_name attribute_value`
For example, to modify the ServiceName attribute of the Netlsnr resource, Netlsnr_res, type:
`C:\> hares -modify Netlsnr_res ServiceName attribute_value`
where, *attribute_value* is the name of the listener service in Oracle 9i or 10g versions.
- 4 Online the Netlsnr resource. Type the following on the command prompt:
`C:\> hares -online resource_name -sys system_name`

Removing Application Pack 1

If you are removing the application pack and SFW HA 5.1 SP1, the application pack must be removed first. For information on removing SFW or SFW HA 5.1 SP1, refer to the *Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Installation and Upgrade Guide*.

Warning: Application Pack 1 contains support for several features including Microsoft Exchange Server 2010. If you have configured these applications, then after removing Application Pack 1 you will not be able to use the supported features and applications in a SFW HA 5.1 for Windows clustered environment.

Read the following topics:

- See “[Preparing the SFW HA 5.1 SP1 cluster](#)” on page 36.
- See “[Removing Application Pack 1 using the GUI](#)” on page 37.
- See “[Removing Application Pack 1 from the command line](#)” on page 40.

Preparing the SFW HA 5.1 SP1 cluster

Before removing the application pack, delete the Exchange Server 2010 service group if it is configured in the cluster. Then use the VCS Cluster Manager (Java Console) to save and close the configuration. This operation involves saving the latest configuration to disk and changing the configuration state to read-only mode. You must also bring the service groups offline and stop VCS before removing the application pack.

Warning: Some configurations may require other steps. Before removing the application pack or performing the following steps, check the Support website at the following URL for updates or additions to the procedure:
<http://entsupport.symantec.com/docs/316327>

Perform the following steps.

To save and close the configuration

- ◆ From the VCS Cluster Manager (Java Console), click **Save and Close Configuration** on the Cluster Explorer toolbar.

To bring the service groups offline

- ◆ From the VCS Cluster Manager (Java Console), right-click the service group and select the **Offline** menu option.
or

From the command prompt, type:

```
hagrp -offline group_name -sys system_name
```

where *group_name* is the name of the service group and *system_name* is the node on which the group is online.

Repeat this command for all service groups that are online.

To stop VCS High Availability Engine (HAD)

- ◆ Stop the Veritas High Availability Engine (HAD) on all the cluster nodes that you wish to remove the application pack from.

Type the following at the command prompt:

```
hastop -all -force
```

Removing Application Pack 1 using the GUI

The following procedure describes how to remove SFW HA 5.1 SP1 Application Pack 1 for Windows from the cluster. After removing the application pack, the systems are restored to the SFW HA 5.1 SP1 version level.

To remove the application pack using the GUI

- 1 In the Windows Control Panel, select **Programs > Select Programs > Select Programs and Features**.
- 2 Select and right-click on **Application Pack 1 for Service Pack 1 of SFW 5.1, SFWHA 5.1, and VCS 5.1 for Windows**.
An Uninstall/Change pop-up box appears.
Click **Uninstall**.
- 3 The 5.1 SP1 Application Pack 1 Installer Welcome screen appears.
Read the prerequisites for the uninstall and click **Next**.
- 4 In the System Selection screen, either enter a system name in the field at the top of the screen and click the **Add** button, or click the **Browse** button to locate the system for the uninstall and then click the **Add** button.
The system or systems selected for the uninstall are then verified for the uninstall process. When the Status field displays “Ready for uninstall”, click **Next**.
If the system already appears in the view with the Status Field displaying “Ready for uninstall”, click **Next**.

Note: Clicking on the blue “i” button provides information about the verification for uninstall; clicking the red “x” button removes the system from the uninstall list. Clicking the **Re-verify** button, starts another system uninstall verification.

- 5 The pre-uninstall Summary screen appears next. Review the information in this view prior to proceeding. The following information is listed in the summary report:
 - Start time for the uninstall and log file location
 - Selected Solutions for the uninstall
 - Selected Systems for the uninstall including:
 - Domain name
 - Installation path
 - Installed Solutions for the install including:
 - Client components
 - Server components
 - Application Pack 1
 - Installed Options for the install including:
 - Symantec Trusted Software Publisher Certificate
 - Replace Disk Management Snap-in with SFW VEA GUI for Windows Server 2008
 - Product documentation
 - Supported DMP DSMs
 - FlashSnap
 - Cluster Option for MSCS/Failover Cluster
 - Volume Replicator (VVR)
 - VxCache

Click the **Save Report** button to access a Save Webpage screen. You can then save an .htm, html file format report of this information.

Click **Next** to proceed with the uninstall.

- 6 After clicking on **Next** to proceed with the uninstall, the uninstall process screen appears. You view the uninstall progress from this screen. When the uninstall process is finished, the following information is displayed:
 - A message appears in the Status field that the “Operation completed successfully.”.
 - The In Progress field displays the total number of successful system uninstalls.
 - The progress bar displays Overall Progress at 100%.

Click **Next** after receiving an “Operation completed successfully” message.

- 7 A Post-uninstall Summary screen displays next.

Review the information in this view prior to proceeding. The following information is listed in the Post-uninstall Report:

- Start time for the uninstall and log file location
- Selected Solutions for the uninstall
- Selected Systems for the uninstall including:
 - Uninstall Status
 - Domain name
 - Installation path
- Installed Solutions for the uninstall including:
 - Client components
 - Server components
 - Application Pack 1
- Installed Options for the uninstall including:
 - Symantec Trusted Software Publisher Certificate
 - Replace Disk Management Snap-in with SFW VEA GUI for Windows Server 2008
 - Product documentation
 - Supported DMP DSMs
 - FlashSnap
 - Cluster Option for MSCS/Failover Cluster
 - Volume Replicator (VVR)
 - VxCache
- Detailed uninstall Status
 - Pre-uninstall Operations
 - Uninstall Operations

Click the **Save Report** button to access a Save Webpage screen. You can then save an .htm, html file format report of this information.

Click **Next** to proceed with the installation.

- 8 Review the Finish screen message and click **Next**.

Removing Application Pack 1 from the command line

The following procedure describes how to remove SFW HA 5.1 SP1 Application Pack 1 for Windows using the Setup.exe command to perform a silent removal from the command line. With a silent removal, you can remove the application pack on only one computer at a time. After removing the application pack, the system is restored to the SFW HA 5.1 SP1 for Windows version level.

Examples showing the removal of the application pack are included at the end of this section.

Note: For Windows Server 2008, all CLI commands must run in the command window in the “run as administrator” mode.

To remove Application Pack 1 using the command line

- 1 Click **Start > Run**, type **cmd** and then click **OK** to open the command prompt.
- 2 From the command prompt, navigate to the location where you have copied the application pack installation files.
- 3 To remove Application Pack 1, type the following command at the command prompt:

```
Setup.exe /s INSTALL_MODE=<InstallMode>  
SOLUTIONS=<SolutionID> NODE=<nodename> options=<Option  
ID>
```

[Table 1-6](#) describes the values that the parameters can take.

Table 1-6 Setup.exe: Silent install parameters

Parameter	Usage
/s	Set for silent mode. If not entered, the product installer GUI starts.
Install_Mode	Set to indicate an installation or uninstallation. 1 = To install or upgrade the product 5 = To uninstall the product The installer automatically detects whether it is a fresh install or an upgrade and performs the necessary tasks accordingly. The default value is 1. Example: INSTALL_MODE=1
Solutions	Set this value to 5 for Application Pack 1
Node	Set the node name. Specify only one node at a time. The default setting is the local node. Example: Node=SysA

Table 1-6 Setup.exe: Silent install parameters (Continued)

Parameter	Usage
options	<p>Option to select a feature to be installed. This can take the following values:</p> <ul style="list-style-type: none"> ■ Exchange2010 (Exchange 2010 feature) ■ NTAP60 (NetApp Snapdrive 6.0 feature) <p>This option is not applicable for SFW or SFW HA installations.</p> <p>You can choose either or both options. When using both options they must be separated by a comma. Enclose the options in double quotes.</p> <p>Example: Option Id="Exchange2010,NTAP60"</p>

Silent removal example: Local Server

This command removes the application pack from the local node.

```
Setup.exe /s INSTALL_MODE=5 SOLUTIONS=5
options="Exchange2010"
```

Silent removal example: Remote Server

This command removes the application pack from a remote node. It states that the node it is removing it from is SysA.

```
Setup.exe /s INSTALL_MODE=5 SOLUTIONS=5 NODE=SysA
options="Exchange2010"
```

Repairing the installation

The product installer provides a Repair option to repair the existing installation. This installer can only repair the local system.

Note: In the Repair Option, only the missing files are added. Other changes like changes in the types.cf must be made manually.

To repair the installation

- 1 In the Windows Control Panel, select **Programs > Select Programs > Select Programs and Features**.
- 2 Select and right-click on **Application Pack 1 for Service Pack 1 of SFW 5.1, SFWHA 5.1, and VCS 5.1 for Windows**.
An Uninstall/Change pop-up box appears.
Click **Change**.
- 3 The Mode Selection screen appears. The following options are available from this screen view:
 - Add or Remove
 - Repair
 - License Management
- 4 The Option Selection screen appears next. Check the individual boxes to install the selected features on your system for Application Pack 1 for Service Pack 1 of SFW 5.1, SFW HA 5.1, and VCS 5.1 for Windows.
Click **Next**.
- 5 In the System Selection screen that appears next, either enter a system name in the field at the top of the screen and click the **Add** button, or click the **Browse** button to locate the system for the install and then click the **Add** button. You can enter multiple systems for installation using this screen view.
After the system or systems appears in the view, Click **Next**.
- 6 After entering a system or systems and clicking **Next**, a verification process is performed on the system or systems.
In the System field, the system name appears. In the Status field, a “Verification failed” message appears if the verification fails. If the verification is successful, a “Ready for install” message appears.
Clicking on the blue “i” button provides information about the verification; clicking the red “x” button removes the system from the installation list.
Clicking the folder icon permits you to choose another directory for the installation.

Clicking the **Re-verify** button, starts another system verification.

Note: If your systems are not verified for installation, you will not be able to proceed.

Click **Next** after verification, and the “Ready for install” message appears in the Status field.

- 7 The Pre-install Summary screen appears next. Review the information in this view prior to proceeding. The following information is listed in the summary report:

- Start time for the installation and log file location
- Selected Solutions for the install
- Selected Systems for the install including:
 - Operating system
 - Domain name
 - Installation path
 - Free space in System drive
- Installed Solutions for the install including:
 - Client components
 - Server components
- Installed Options for the install including:
 - Symantec Trusted Software Publisher Certificate
 - Replace Disk Management Snap-in with SFW VEA GUI for Windows Server 2008
 - Product documentation
 - Supported DMP DSMs
 - FlashSnap
 - Cluster Option for MSCS/Failover Cluster
 - Volume Replicator (VVR)
 - VxCache

Click the **Save Report** button to access a Save Webpage screen. You can then save an .htm, html file format report of this information.

Click **Next** to proceed with the installation.

- 8 After clicking **Next**, the 5.1 SP1 Application Pack Installation screen appears. You view the installation progress from this screen.

When the installation is finished, the following information is displayed:

- A message appears in the Status field that the “Operation completed successfully.”.

- The In Progress field displays the total number of successful system installations.

- The progress bar displays Overall Progress at 100%.

Click **Next** after receiving an “Operation completed successfully” message.

- 9 A Post-install Summary screen displays next. Review the information in this view prior to proceeding. The following information is listed in the Post-install Report:

- Start time for the installation and log file location
- Selected Solutions for the install
- Selected Systems for the install including:
 - Install Status
 - Operating system
 - Domain name
 - Installation path
- Installed Solutions for the install including:
 - Client components
 - Server components
- Installed Options for the install including:
 - Symantec Trusted Software Publisher Certificate
 - Replace Disk Management Snap-in with SFW VEA GUI for Windows Server 2008
 - Product documentation
 - Supported DMP DSMs
 - FlashSnap
 - Cluster Option for MSCS/Failover Cluster
 - Volume Replicator (VVR)
 - VxCache
- Detailed Install Status
 - Pre-install Operations
 - Install Operations

Click the **Save Report** button to access a Save Webpage screen. You can then save an .htm, html file format report of this information.

Click **Next** to proceed with the installation.

- 10 Review the Finish screen message and click **Next**.

Software limitations

The following limitations apply to the Application Pack 1 for Veritas Storage Foundation 5.1 SP1 for Windows and Veritas Storage Foundation HA 5.1 SP1 for Windows.

For the latest information on updates, patches, and software issues regarding this release, see the following TechNote:

<http://entsupport.symantec.com/docs/303042>

Installation or upgrade

TBD

Veritas Storage Foundation

TBD

Veritas Cluster Server

TBD

Veritas Volume Replicator

TBD

Known issues

The following known issues exist in the Application Pack 1 for Veritas Storage Foundation 5.1 for Windows and Veritas Storage Foundation HA 5.1 for Windows.

For the latest information on updates, patches, and software issues regarding this release, see the following TechNote:

<http://entsupport.symantec.com/docs/303042>

Installation, upgrades, and licensing

This section provides information on known installation, upgrade, and licensing issues.

TBD

Veritas Storage Foundation

TBD

Veritas Cluster Server

TBD

Veritas Volume Replicator

TBD

Software fixes and enhancements

Fixed issues and software enhancements are referenced by Symantec incident number and described briefly below.

TBD

Documentation changes

The information in this section updates information provided in the product documentation for Veritas Storage Foundation 5.1 SP1 for Windows and Veritas Storage Foundation HA 5.1 SP1 for Windows.

TBD

Documentation

Storage Foundation for Windows documentation is included on the product software discs for Veritas Storage Foundation and High Availability Solutions 5.1 SP1 AP1 for Windows in Adobe Portable Document Format (PDF). Explore the \Docs directory of the software disc and double-click the file name to view a document.

The Application Pack 1 release includes the following new and updated documents.

Table 1-7 New and Updated Documents for SFW HA 5.1 SP1 Application Pack 1

Title	File Name
<i>Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange 2010</i>	SFW_HA_DR_Exch2010_Solutions.pdf
<i>Veritas Storage Foundation and High Availability Solutions Quick Recovery Solutions Guide for Microsoft Exchange 2010</i>	SFW_QR_Exch_Solutions.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 SP1 Application Pack 1 Release Notes</i>	SFWHA_ReleaseNotes.pdf

Note: Updates to release notes can be found at:
<http://entsupport.symantec.com/docs/303042>

Table 1-8 Veritas Storage Foundation and High Availability Solutions for Windows Documentation Set

Title	File Name
Veritas Storage Foundation and High Availability Solutions	
<i>Veritas Storage Foundation and High Availability Solutions 5.1 Getting Started Guide</i>	SFW_GettingStarted.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 Installation and Upgrade Guide</i>	SFW_InstallUpgrade.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 Release Notes</i>	SFW_ReleaseNotes.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 Solutions Guide</i>	SFW_Solutions.pdf

Table 1-8 Veritas Storage Foundation and High Availability Solutions for Windows Documentation

Title	File Name
<i>Veritas Storage Foundation and High Availability Solutions 5.1 HA and Disaster Recovery Solutions Guide for Microsoft Exchange</i>	SFW_HA_DR_Exch2003_Solutions.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 HA and Disaster Recovery Solutions Guide for Microsoft Exchange 2007</i>	SFW_HA_DR_Exch2007_Solutions.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 Quick Recovery and Microsoft Clustering Solutions Guide for Microsoft Exchange</i>	SFW_QR_MSCS_Exch_Solutions.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 HA and Disaster Recovery Solutions Guide for Microsoft SQL</i>	SFW_HA_DR_SQL_Solutions.pdf
<i>Veritas Storage Foundation and High Availability Solutions 5.1 Quick Recovery and Microsoft Clustering Solutions Guide for Microsoft SQL</i>	SFW_QR_MSCS_SQL_Solutions.pdf
Veritas Storage Foundation	
<i>Veritas Storage Foundation 5.1 Administrator's Guide</i>	SFW_Admin.pdf
Veritas Cluster Server	
<i>Veritas Cluster Server 5.1 Administrator's Guide</i>	VCS_Admin.pdf
<i>Veritas Cluster Server 5.1 Agent Developer's Guide</i>	VCS_AgentDev.pdf
<i>Veritas Cluster Server 5.1 Bundled Agents Reference Guide</i>	VCS_BundledAgents.pdf
<i>Veritas Cluster Server 5.1 Application Note: Disaster Recovery for Microsoft SharePoint Server</i>	VCS_AppNote_Sharepoint.pdf
<i>Veritas Cluster Server 5.1 Application Agent for Microsoft Exchange, Configuration Guide</i>	VCS_Exch_Agent.pdf
<i>Veritas Cluster Server 5.1 Database Agent for Oracle, Configuration Guide</i>	VCS_Oracle_Agent.pdf
<i>Veritas Cluster Server 5.1 Database Agent for Microsoft SQL, Configuration Guide</i>	VCS_SQL_Agent.pdf
<i>Veritas Cluster Server 5.1 Hardware Replication Agent for EMC SRDF, Configuration Guide</i>	VCS_SRDF_Agent.pdf

Table 1-8 Veritas Storage Foundation and High Availability Solutions for Windows Documentation

Title	File Name
<i>Veritas Cluster Server 5.1 Hardware Replication Agent for EMC SRDF/Star, Configuration Guide</i>	VCS_SRDFStar_Agent.pdf
<i>Veritas Cluster Server 5.1 Hardware Replication Agent for Hitachi MirrorView, Configuration Guide</i>	VCS_MirrorView_Agent.pdf
<i>Veritas Cluster Server 5.1 Hardware Replication Agent for Hitachi TrueCopy, Configuration Guide</i>	VCS_TrueCopy_Agent.pdf
<i>Veritas Cluster Server 5.1 Hardware Replication Agent for IBM Metro Mirror, Configuration Guide</i>	VCS_MetroMirror_Agent.pdf
Veritas Cluster Server Management Console	
<i>Veritas Cluster Server Management Console 5.1 Implementation Guide</i>	VCMC_Implementation.pdf
<i>Veritas Cluster Server Management Console 5.1 Release Notes</i>	VCMC_Notes.pdf
Veritas Volume Replicator	
<i>Veritas Storage Foundation 5.1 Volume Replicator, Administrator's Guide</i>	VVR_Admin.pdf
<i>Veritas Storage Foundation 5.1 Volume Replicator Advisor, User's Guide</i>	VVR_Advisor.pdf
Symantec Product Authentication Service	
<i>Veritas Storage Foundation and High Availability Solutions 5.1, Quick Start Guide for Symantec Product Authentication Service</i>	SPAS_QuickStart.pdf
<i>Symantec Product Authentication Service 4.3 Administrator's Guide</i>	SPAS_AT_Admin.pdf
<i>Symantec Product Authentication Service 4.3 Release Notes</i>	SPAS_AT_ReleaseNotes.pdf

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