Veritas Storage Foundation™ and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SharePoint® Server 2007

Windows Server 2008 (x64), Windows Server 2008 R2 (x64)

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Symantec™

Veritas Storage Foundation™ and Disaster Recovery Solutions for Microsoft SharePoint® Server 2007

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Contents

Chapter 1

Planning for SharePoint with VCS

This chapter includes the following topics:

What this guide covers

In a disaster recovery configuration, you set up a secondary site to provide data and services in the event of a disaster at the primary site.

This guide covers guidelines and requirements for implementing SharePoint Server 2007 with Veritas Cluster Server (VCS) for disaster recovery.

VCS is a component of Veritas Storage Foundation HA for Windows (SFW HA).

Use this guide as a supplement to the solutions guides that cover deploying high availability and disaster recovery for Microsoft SQL Server.

See "Where to go for more information" on page 10.

Where to go for more information

This guide is a supplement to the following solutions guides that cover deploying high availability and disaster recovery for Microsoft SQL Server:

- *Veritas Storage Foundation and HA Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005*
- *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2*

Software requirements

The following software is required for this solution:

Veritas Storage Foundation HA 6.0 for Windows, including: ■ Veritas Volume Replicator ■ Global Clustering Option	For information on system and software requirements for SFW HA 6.0, see the following: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*
One of the following: ■ Microsoft SQL Server 2005 and its supported operating systems ■ Microsoft SQL Server 2008 or 2008 R2 and its supported operating systems	For information on software versions supported with SFW HA, see the following: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*

Microsoft Office SharePoint Server 2007 SP1 (x64)	For information on requirements for SharePoint Server 2007, see the appropriate Microsoft SharePoint documentation.

Implementation process overview

You can implement SharePoint with VCS for disaster recovery in the following ways:

- Setting up a new installation of SFW HA and SQL Server with SharePoint
- Converting an existing standalone SQL Server to an SFW HA environment with SharePoint

Deploying new SQL Server installation

Table 1-1 shows the process for a new installation of SFW HA, SQL Server, and SharePoint.

Table 1-1 New installation of SQL Server and SharePoint

Task	For more information
On the primary site, install and set up SFW HA and SQL Server for high availability.	See the following as appropriate: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*
On the primary site, install and configure the SharePoint servers.	See the Microsoft documentation for SharePoint. See "Configuring SharePoint " on page 28.
On the primary site, edit the SQL Server service group for disaster recovery as covered in this guide.	See "Configuring the VCS SQL Server service group for the SharePoint environment" on page 28.

Table 1-1 New installation of SQL Server and SharePoint *(continued)*

Task	For more information
On the secondary site, create a parallel SFW HA and SQL Server high availability environment.	See the following as appropriate: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*
On the primary and secondary sites, configure SFW HA for disaster recovery.	See the following as appropriate: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*
On the secondary site, install and configure the SharePoint servers.	See the Microsoft documentation for SharePoint. See "Configuring SharePoint " on page 28.

Converting existing SQL Server installation

Table 1-2 shows the process for converting an existing installation of SQL Server and SharePoint.

Table 1-2 Converting existing stand-alone SQL Server

Task	For more information
On the primary site, convert the stand-alone SQL Server to a clustered server in a Storage Foundation HA environment.	See the following as appropriate: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*

Table 1-2 Converting existing stand-alone SQL Server *(continued)*

Task	For more information
On the primary site, edit the SQL Server service group for disaster recovery as covered in this guide.	See "Configuring the VCS SQL Server service group for the SharePoint environment" on page 28.
On the secondary site, create a parallel SFW HA and SQL Server high availability environment.	See the following as appropriate: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*
On the primary and secondary sites, configure SFW HA for disaster recovery.	See the following as appropriate: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*
On the secondary site, install and configure the SharePoint servers.	See the Microsoft documentation for SharePoint See "Configuring SharePoint " on page 28.

Supported SharePoint configurations

Table 1-3 shows the SharePoint configurations supported for setting up SharePoint with VCS for disaster recovery.

Table 1-3 SharePoint configurations supported with VCS

Configuration	Description
Large Server Farm	■ One or more computers running SQL Server ■ Two or more front-end Web servers ■ Two or more search engines ■ One or more index management servers, one of which is the job server

Table 1-3 SharePoint configurations supported with VCS *(continued)*

Configuration	Description
Medium Server Farm	■ One or more computers running SQL Server ■ One or two front-end web servers with the search component enabled ■ One index management and job server
Small Server Farm	■ One or more computers running SQL Server ■ One computer running as the job server and running all of the following: the Web server, index component, and search component.

Note: VCS disaster recovery does not support a single server configuration in which both SQL Server and SharePoint are running on the same computer.

A shared services deployment is also supported for disaster recovery. In this configuration, index and search services provided by one server farm are used by a second server farm, in a parent and child relationship.

Primary and secondary site configuration

Table 1-4 shows how the secondary site configuration compares to the primary site configuration.

Table 1-4 Primary and secondary site configuration

Product	Configuration
SQL Server	Set up the SQL Server configuration on the secondary site the same as on the primary site. See the following as appropriate for your SQL version: ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005.* ■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2.*

Table 1-4 Primary and secondary site configuration *(continued)*

Product	Configuration
SharePoint	The number of computers and which components are installed on each does not need to match the primary site. All the SharePoint components could be on multiple computers in the primary site, as on a large server farm configuration, and share the same computer on the secondary site, as in a small server farm configuration. Index propagation to the secondary site requires that on the primary site, the Index/Job Server be on a separate computer from the Web/Search roles. You typically set up the SharePoint components on both primary and secondary sites as part of the same topology (server farm).

Network configuration requirements

You should be familiar with requirements for setting up the network configuration to support high availability and disaster recovery.

See *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005*.

See *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2*.

The following summarizes the network configuration requirements for the SQL Server and SharePoint components:

- One domain that includes both primary and secondary sites
- One SQL Server virtual server name
  You configure a virtual server name for SQL Server as part of setting up high availability. You also assign an instance name. The SQL Server instance in both the primary and secondary sites is assigned the same virtual server name. The SharePoint web server connection to the SQL database is configured by virtual server name and instance name. Since only one instance of the SQL application is running at one time, there is no host name collision.
- Two SQL Server IP addresses, one for the primary site and one for the secondary site
  The active and passive SQL servers on the same site share the same static IP address.
- Network Load Balancer (NLB) IP address or web server address
  Multiple SharePoint web servers are typically set up on a network load balancer (NLB) cluster. You can use a hardware or software solution to implement the

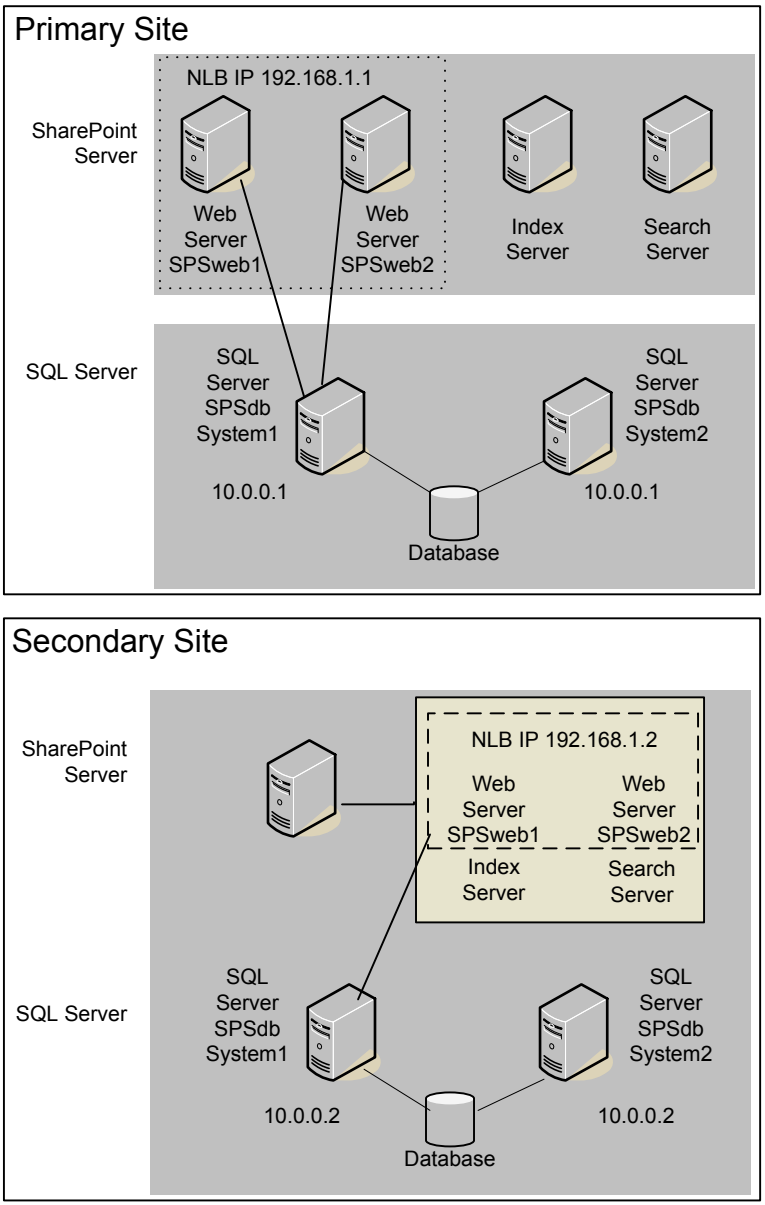
NLB cluster. You can implement a global NLB that includes both sites or separate local NLB clusters for each site.

If using a local NLB, you can configure the NLB on the primary site with a different IP address than the NLB on the secondary site. This enables you to switch user requests to the IP address of the secondary site web servers if the primary site goes down.

Example configuration

Figure 1-1 shows an example disaster recovery configuration.

Figure 1-1 Example configuration



The illustrated example configuration is set up as follows:

Example primary site	An active/passive configuration of two machines running SQL Server (SYSTEM1 active and SYSTEM2 passive), with a virtual IP address of 10.0.0.1, both connected to the SQL database shared storage Four servers running SharePoint components: ■ Two web servers using Microsoft Network Load Balancing (NLB) cluster service with an IP address of 192.168.1.1 The web servers connect to the active SQL Server instance. ■ An index management server ■ A search server
Example secondary site	An active/passive configuration of two machines running SQL Server (SYSTEM1 active and SYSTEM2 passive), with a virtual IP address of 10.0.0.2, both connected to the SQL database shared storage One server running the SharePoint components: ■ Two web servers using Microsoft Network Load Balancing (NLB) cluster service with an IP address of 192.168.1.2 The web servers connect to the active SQL Server instance. ■ An index management server and a search server on the same machine

Replication considerations

VCS enables clustering and data replication for the SQL Server only. Any data stored locally on the SharePoint web servers, index servers, and search servers rather than in the SQL database is not replicated. This non-replicated data includes the SharePoint index.

One way to provide search capabilities in the event of a disaster recovery scenario is to set up a scheduled propagation from the index server at the primary site to the search server at the secondary site. The search server at the secondary site can then handle the search requests if the primary site goes down.

For more information on index propagation, see the Microsoft documentation for SharePoint.

SharePoint failover considerations

In a disaster recovery scenario, VCS brings the SQL Server service group online in the secondary site. VCS does not bring the SharePoint servers online. Therefore,

you may prefer to maintain the secondary site SharePoint servers online but not in use until needed for disaster recovery.

You can configure VCS to perform a DNS update to switch user requests to the secondary site web servers if the primary site goes down.

See "DNS update considerations" on page 19.

DNS update considerations

When planning for disaster recovery in the SharePoint environment, you need to plan for updating IP addresses on the DNS server. You configure VCS to update the SQL Server virtual IP address on the DNS server when the remote site comes online. Optionally, if needed for your environment, you can configure VCS to update the web server/NLB virtual IP address on the DNS server.

About updating the SQL Server IP address

As part of the disaster recovery process of switching from the primary to secondary site, the DNS server must be updated with the site-specific virtual IP address for the SQL Server. Likewise, when switching back to the primary site, the DNS server must be updated again.

As an example, let's assume that the SQL virtual server name is SPSdb. When the primary site is online, SPSdb is associated with the primary site virtual IP address, for example, 10.0.0.1. When the secondary site comes online, the DNS server address list is updated so that SPSdb is associated with the IP address 10.0.0.2 (the secondary site virtual IP address).

You can configure VCS so that the update occurs automatically as part of the process of the SQL Server instance coming online.

See "Updating the SQL Server IP address" on page 29.

About updating the web server/NLB IP address

Multiple SharePoint web servers are typically set up on a network load balancer (NLB) cluster. You can use a hardware or software solution to implement the NLB cluster. You can implement a global NLB that includes both sites or a local NLB for each site.

If a local NLB is used, each NLB has a separate static IP address. When a site goes down in a disaster recovery scenario, user requests must be switched to the NLB at the secondary site. Therefore, in the DNS server, the virtual IP address associated with the NLB on the primary site must be updated with the virtual IP address for the NLB on the secondary site.

You can configure VCS so that the update occurs automatically as part of the process of the SQL Server instance coming online.

See “Updating the IP address for web requests” on page 31.

The web servers may take a few seconds to flush the cached IP address for the SQL Server and replace it with the new one. During that time a "cannot find content" message may be displayed in response to user requests.

Chapter 2

Configuring VCS with SharePoint

This chapter includes the following topics:

Tasks for a new installation of SQL Server

Setting up a new installation of SQL Server with SFW HA for high availability and disaster recovery is covered in the following solution guides:

- *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005*
- *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2*

Some additional tasks are required to configure SFW HA for SharePoint, depending on your SharePoint environment.

Table 2-1 lists the full set of tasks so that you can use as a checklist. The table also shows which tasks are specific to the SharePoint environment and where to find more information on the SharePoint related tasks and requirements.

Table 2-1 Tasks for a new installation of SQL Server

Objective	Tasks	Additional information for SharePoint
Reviewing the prerequisites	■ Verifying hardware and software prerequisites	See "Software requirements" on page 10. See "Network configuration requirements" on page 15.
Reviewing the SFW HA configuration	■ Understanding active/passive configuration ■ Reviewing the sample configuration	
Reviewing the SharePoint configuration	■ Reviewing SharePoint configurations supported by SFW HA	See "Supported SharePoint configurations" on page 13.
Configuring the network and storage on the primary site	■ Setting up the storage hardware for a cluster environment ■ Verifying the DNS entries for the systems on which SQL will be installed	
Installing and configuring SFW HA on the primary site	■ Installing Veritas Storage Foundation HA for Windows (automatic installation) ■ Selecting the option to install VVR and the GCO option	
Configuring cluster disk groups and volumes on the primary site	■ Creating a dynamic cluster disk group using the Veritas Enterprise Administrator (VEA) ■ Creating dynamic volumes for the SQL system database, user databases, transaction logs, and replicated registry keys using the VEA	
Configuring the cluster on the primary site	■ Verifying static IP addresses and name resolution configured for each node ■ Configuring cluster components and setting up secure communication for the cluster using the Veritas Cluster Server Configuration Wizard	
Installing and configuring SQL Server on the first node of the primary site	■ Ensuring that the disk group and volumes are mounted on the first node ■ Following the guidelines for installing SQL Server in an SFW HA environment	

Table 2-1 Tasks for a new installation of SQL Server *(continued)*

Objective	Tasks	Additional information for SharePoint
Installing and configuring SQL Server on the second or additional nodes of the primary site	■ Stopping the SQL services on the first node ■ Ensuring that the disk group and volumes are mounted on the second node ■ Following the guidelines for installing SQL Server on a failover node in an SFW HA environment	
Creating a SQL Server user defined database	■ Creating volumes, if not created already, for a user-defined database and transaction log ■ Creating a new user-defined database in SQL Server	
Configuring the VCS SQL Server service group on the primary site	■ Creating a SQL Server service group using one of the following: ■ the VCS SQL Configuration wizard for SQL Server 2005 ■ the VCS SQL Server 2008 Configuration Wizard for SQL Server 2008 or 2008 R2	
Verifying the SQL Server high availability configuration on the primary site	■ Simulating failover ■ Switching online nodes	
Setting up the SharePoint servers on the primary site	■ Installing and configuring SharePoint on the primary site	See "Configuring SharePoint " on page 28.
Modifying the SQL Server service group Lanman agent settings on the primary site	■ Editing the attribute settings of the VCS Lanman agent resource to update the DNS server in a disaster recovery scenario	See "Updating the SQL Server IP address" on page 29.
Optionally, configuring the SQL Server service group to update the SharePoint web server/NLB IP address	■ Customizing a VCS script configuration file for the primary site ■ Editing the SQL service group to add a process resource for the script	See "Updating the IP address for web requests" on page 31.
Creating a parallel SFW HA environment on the secondary site	■ Reviewing the prerequisites ■ Reviewing the configuration ■ Configuring the network and storage ■ Installing SFW HA ■ Configuring the cluster using the Veritas Cluster Server Configuration Wizard ■ Configuring disk groups and volumes for SQL	

Table 2-1 Tasks for a new installation of SQL Server *(continued)*

Objective	Tasks	Additional information for SharePoint
Installing and configuring SQL Server on the first node of the secondary site	■ Ensuring that the disk group and volumes are mounted on the first node ■ Following the guidelines for installing SQL Server in an SFW HA environment	
Installing and configuring SQL Server on the second or additional nodes of the secondary site	■ Stopping the SQL services on the first node ■ Ensuring that the disk group and volumes are mounted on the second node ■ Following the guidelines for installing SQL Server on a failover node in an SFW HA environment	
Creating the SQL service group configuration on the secondary site	■ Creating the SQL service group configuration on the secondary site	
Configuring VVR and global clustering	■ Configuring VVR components and global clustering	
Setting up the SharePoint servers on the secondary site	■ Installing and configuring SharePoint on the secondary site	See "Configuring SharePoint " on page 28.
Modifying the SQL Server service group Lanman agent settings on the secondary site	■ Editing the attribute settings of the VCS Lanman agent resource to update the DNS server in a disaster recovery scenario	See "Updating the SQL Server IP address" on page 29.
If using the scripts for updating web server IP address, installing and configuring the scripts for the secondary site	■ Installing the script files in a location on the secondary site that matches the location on the primary site ■ Customizing the script configuration file settings for the secondary site	See "Updating the IP address for web requests" on page 31.

Note: SFW HA provides a wizard that automates some disaster recovery configuration tasks on the secondary site. The task references in this table are based on configuring the secondary site manually rather than with the wizard.

Tasks for an existing installation of SQL Server

You can convert an existing standalone SQL Server site into an SFW HA high availability site. Setting up high availability for an existing standalone SQL Server environment is covered in detail in the following solutions guides:

- *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005*
- *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2*

A few additional tasks may be required to configure SFW HA for SharePoint, depending on your SharePoint environment.

Table 2-2 lists the full set of tasks so that you can use them as a checklist. The table also shows which tasks are specific to the SharePoint environment and where to find more information on SharePoint related tasks and requirements.

Table 2-2 Tasks for converting an existing SQL Server installation for SFW HA

Objective	Tasks	Additional information for SharePoint
Reviewing the prerequisites	■ Verifying hardware and software prerequisites	See "Software requirements" on page 10. See "Network configuration requirements" on page 15.
Reviewing the SFW HA configuration	■ Understanding active/passive configuration ■ Reviewing the sample configuration	
Reviewing the SharePoint configuration	■ Reviewing SharePoint configurations supported by SFW HA	See "Supported SharePoint configurations" on page 13.
Configuring the network and storage	■ Setting up the storage hardware for a cluster environment ■ Verifying the DNS entries for the systems on which SQL will be installed	
Preparing the standalone SQL Server	■ Backing up existing data ■ Setting SQL Server services to manual start	
Installing and configuring SFW HA on the primary site	■ Installing Veritas Storage Foundation HA for Windows (automatic installation) ■ Selecting the GCO option for disaster recovery and the Veritas Volume Replicator (VVR) replication option	

Table 2-2 Tasks for converting an existing SQL Server installation for SFW HA *(continued)*

Objective	Tasks	Additional information for SharePoint
Configuring cluster disk groups and volumes on the primary site	■ Creating a dynamic cluster disk group using the Veritas Enterprise Administrator (VEA) ■ Creating dynamic volumes for the SQL system database, user databases, transaction logs, and replicated registry keys using the VEA	
Configuring the cluster on the primary site	■ Verifying static IP addresses and name resolution configured for each node ■ Configuring cluster components and setting up secure communication for the cluster using the Veritas Cluster Server Configuration Wizard	
Moving the existing SQL Server data files and user databases to shared storage	■ Ensuring that existing data is backed up ■ Stopping SQL Server service ■ Modifying data file and user database locations	
Installing and configuring SQL Server on additional nodes on the primary site	■ Stopping the SQL services on the first node ■ Ensuring that the disk group and volumes are mounted on the second node ■ Following the guidelines for installing SQL Server on a failover node in an SFW HA environment	
Configuring the VCS SQL Server service group on the primary site	■ Creating a SQL Server service group using one of the following: ■ the VCS SQL Configuration wizard for SQL Server 2005 ■ the VCS SQL Server 2008 Configuration Wizard for SQL Server 2008 or 2008 R2	
Configuring the SharePoint server connection to the SQL virtual server	■ Configuring existing SQL Server clients to connect to the SQL virtual server name/instance name	See "Configuring SharePoint " on page 28.
Verifying the SQL Server high availability configuration on the primary site	■ Simulating failover ■ Switching online nodes	
Modifying the SQL Server service group Lanman agent settings on the primary site	■ Editing the attribute settings of the VCS Lanman agent resource to update the DNS server in a disaster recovery scenario	See "Updating the SQL Server IP address" on page 29.

Table 2-2 Tasks for converting an existing SQL Server installation for SFW HA *(continued)*

Objective	Tasks	Additional information for SharePoint
Optionally, configuring the SQL Server service group to update the SharePoint web server/NLB IP address	■ Customizing a VCS script configuration file for the primary site ■ Editing the SQL service group to add a process resource for the script	See "Updating the IP address for web requests" on page 31.
Creating a parallel SFW HA environment on the secondary site	■ Reviewing the prerequisites ■ Reviewing the configuration ■ Configuring the network and storage ■ Installing SFW HA ■ Configuring the cluster ■ Configuring disk groups and volumes for SQL	
Installing and configuring SQL Server on the first node of the secondary site	■ Ensuring that the disk group and volumes are mounted on the first node ■ Following the guidelines for installing SQL Server in an SFW HA environment	
Installing and configuring SQL Server on the second or additional nodes of the secondary site	■ Stopping the SQL services on the first node ■ Ensuring that the disk group and volumes are mounted on the second node ■ Following the guidelines for installing SQL Server on a failover node in an SFW HA environment	

Configuring the VCS SQL Server service group on the secondary site	■ Creating a SQL Server service group using one of the following:
	  ■ the VCS SQL Configuration wizard for SQL Server 2005
	  ■ the VCS SQL Server 2008 Configuration Wizard for SQL Server 2008 or 2008 R2	

Configuring VVR and global clustering	■ Configuring VVR components and global clustering	
Setting up the SharePoint servers on the secondary site	■ Installing and configuring SharePoint on the secondary site	See "Configuring SharePoint " on page 28.
Modifying the SQL Server service group Lanman agent settings on the secondary site	■ Editing the attribute settings of the VCS Lanman agent resource to update the DNS server in a disaster recovery scenario	See "Updating the SQL Server IP address" on page 29.

Table 2-2 Tasks for converting an existing SQL Server installation for SFW HA *(continued)*

Objective	Tasks	Additional information for SharePoint
If using the scripts for updating web server IP address, installing and configuring the scripts for the secondary site	■ Installing the script files in a location on the secondary site that matches the location on the primary site ■ Customizing the script configuration file settings for the secondary site	See "Updating the IP address for web requests" on page 31.

Note: SFW HA provides a wizard that automates some disaster recovery configuration tasks on the secondary site. The task references in this table are based on configuring the secondary site manually rather than with the wizard.

Configuring SharePoint

For full information on installing SharePoint Server 2007, see the Microsoft documentation.

In addition, follow these guidelines when configuring SharePoint on the primary and secondary sites:

Setting up the SharePoint topology	You configure all the SharePoint components on the secondary site as part of the same server farm (topology) as the SharePoint components on the primary site.
Configuring the SharePoint server connections to the database	You configure the SharePoint servers to connect to the SQL database using the SQL virtual server name/instance. When you set up the SharePoint components at the secondary site, you configure the SharePoint servers at both sites to connect to the primary (active) site database.

Configuring the VCS SQL Server service group for the SharePoint environment

To create the VCS SQL Server service group on the primary site, follow the instructions in the SQL Server solutions guide, as follows:

■ *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2005*

- *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft SQL 2008 and 2008 R2*

See "Tasks for a new installation of SQL Server" on page 21.

See "Tasks for an existing installation of SQL Server" on page 25.

After creating the service group, you edit the default configuration of the VCS SQL Server service group to automate updating IP addresses when you switch between sites. After creating the service group on the secondary site, you repeat the procedure for the secondary site.

The following provide additional details:

- Edit the service group to change the attribute settings of the VCS Lanman agent resource.
  See "Updating the SQL Server IP address" on page 29.
- Optionally, depending on your environment, edit the service group to add a process resource that implements a VCS script. You must customize the script configuration settings file separately for each site.
  See "Updating the IP address for web requests" on page 31.

Updating the SQL Server IP address

You configure the VCS Lanman agent to update the DNS server with the virtual IP address for the SQL Server instance that is being brought online. The Lanman agent resource is created automatically as part of the SQL Server service group. However, you need to edit the default Lanman settings.

You must specify the following attribute settings for the Lanman agent, at a minimum:

DNSUpdate	True This setting causes the update of the SQL Server IP address on the DNS server.
DNSCriticalForOnline	True The server will not be able to come online if the DNS update is not successful.
DNSOptions	PurgeDuplicate Removes duplicate DNS entries from the DNS servers.

More information on Lanman agent settings is provided in the agent documentation.

See *Cluster Server Bundled Agents Reference Guide*.

The procedure shows how to edit the Lanman resource of an existing SQL Server service group from the VCS Cluster Manager Java Console. You do this after you create the service group on the primary site and again on the secondary site after creating the service group there.

To configure the Lanman agent resource to update the SQL Server IP address

1. Start the Cluster Manager Java Console, log on to the cluster, and open the Cluster Explorer window (click anywhere in the active Cluster Monitor panel).
2. In the Cluster Explorer configuration tree, expand the SQL Server service group and expand **Lanman**.
3. Under Lanman, right-click the resource icon (labeled with the service group name and the "-Lanman" suffix) and click **View>Properties View**.
4. Expand the Properties View window as necessary to see all attributes under Type Specific Attributes.
5. Edit the following attribute settings by locating the row containing the setting, clicking the Edit icon in that row, and editing the setting as follows in the Edit Attribute dialog box. Leave Global (the default) enabled to apply the attribute to all nodes in the cluster. If initially prompted to switch to read/write mode, click **Yes**.

DNSUpdateRequired	Check DNSUpdateRequired and click **OK**.
DNSCriticalForOnline	Check DNSCriticalForOnline and click **OK**.
DNSOptions	Under Vector Values, click the plus icon to display the list, select **PurgeDuplicate** and click **OK**.

6. If your site uses additional DNS servers, edit the setting for AdditionalDNSServers to specify the IP addresses.
7. In the Cluster Explorer window, click **File>Save Configuration**, and then click **File>Close Configuration**.
8. If you are configuring a resource for the web servers, continue with that procedure; otherwise, log off the cluster and exit the Cluster Manager.

   See "Configuring a resource for the web servers" on page 41.

Updating the IP address for web requests

You can configure VCS to update the DNS server with a site-specific IP address for the SharePoint web servers or NLB. This update occurs as part of the process of bringing the SQL Server service group online.

To automate this, you configure a VCS process resource as part of the SQL Server service group. You configure the resource after you create the service group on the primary site and you repeat the procedure on the service group that you create on the secondary site.

See "Configuring a resource for the web servers" on page 41.

The process resource uses Perl scripts. The scripts read information from a configuration settings file that you must customize separately for each site.

See "Requirements for using the script files" on page 38.

See "Customizing the DNS update settings for the web servers" on page 39.

See "Example VCS configuration file entries (main.cf)" on page 42.

Requirements for using the script files

The DNS update script files are available in the following directory:

```
%VCS_HOME%\bin\SQLServer2008
```

To use the script files, customize the settings file for your environment. You need two copies of the settings file, one with settings for the primary site and one with settings for the secondary site.

See "Customizing the DNS update settings for the web servers" on page 39.

After customizing the settings file for each site, place the script files and the appropriate settings file for the site in a location where they are available from the cluster nodes. Since you specify the file names and locations as part of the service group process resource, you can choose the file names and locations. To avoid editing the service group again on the secondary site, you must use the same names and locations on both sites.

Warning: Do not place the settings file on a replicated volume. Otherwise, the active site's settings file would overwrite the passive site's settings file during replication.

In addition, the scripts require DNScmd.exe, which can be installed from the operating system Support Tools.

The scripts log to the engine log. The name of the log is engine_A.txt.

Customizing the DNS update settings for the web servers

You customize the settings file dnsupdate-settings.txt with the values required by the script used to update the DNS server. For each keyword (in brackets) you enter a value.

Table 2-3 describes the contents of the settings file.

Table 2-3 DNS update settings file

Keyword	Value	Notes
[web alias]	The web server (or NLB) name	Same in both setting files
[local ip]	Comma delimited pair of IP addresses: IP address for the web server or NLB on this site, IP address for the DNS server to be updated Example: 192.168.1.2, 192.168.10.10	When editing the primary site settings file, the local IP is that of the primary site web server or NLB. For the secondary site file, the local IP is that of the secondary site web server or NLB. If you have additional IP addresses for additional web servers or DNS servers, enter them as a comma delimited pair on separate lines.
[remote ip]	Comma delimited pair of IP addresses: IP address for the web server or NLB on the remote site, IP address of the DNS server to be updated Example: 192.168.1.1, 192.168.10.10	When editing the primary site settings file, the remote IP is that of the secondary site web server or NLB. For the secondary site file, the remote IP is that of the primary site web server or NLB. The DNS server to be updated is the one that manages the IP address for the web server or NLB. If you have additional IP addresses for additional web servers or DNS servers, enter them as a comma delimited pair on separate lines.
[dns command]	Path to the location of DNScmd.exe Example: \Program Files\Support Tools	By default, the script will look for DNScmd.exe in \Program Files\Support Tools on the drive where SFW HA is installed, unless you specify another value.
[domain name]	Fully qualified domain of the web server Example: symantecdomain.com	Same in both settings files

Table 2-3 DNS update settings file *(continued)*

Keyword	Value	Notes
[nslookup command]	Full path for nslookup.exe Example: \Windows\System32\nslookup.exe	By default, the script will look for nslookup.exe on the drive where SFW HA is installed in the default directory shown, unless you specify another value.

Configuring a resource for the web servers

You can add a process resource to the SQL Server service group to enable switching to the web servers at the site where the SQL Server service group is brought online. The process resource executes a Perl script to update the DNS server IP address for the web servers.

You add the process resource after you create the service group on the primary site. After you create the service group on the secondary site, you add the process resource to that service group as well.

The procedure shows how to add a resource using the Java Console. You can also use other methods, as described in the VCS documentation.

See *Veritas Cluster Server Administrator's Guide*.

Verify that the Perl executable, the scripts, and the customized settings file is available from the systems on which the service group is configured.

In addition, ensure that DNScmd.exe is installed from the operating system Support Tools to the same drive as the SFW HA application.

To configure a resource for the web servers

1. Start the Cluster Manager Java Console, log on to the cluster, and open the Cluster Explorer window (click anywhere in the active Cluster Monitor panel).
2. In the Cluster Explorer configuration tree, right-click the name of the SQL service group and click **Add Resource**. If prompted to switch to read-write mode, click **Yes**.
3. In the Add Resource dialog box, specify a name for the resource and in the Resource Type list, click **Process**.
4. Edit the following process resource attributes:

StartProgram	The full path names of the following, in the order shown, separated by spaces: ■ The Perl script executable ■ The dnsupdate-online script ■ The script settings file Example: c:\Program Files\Veritas\VRTSPerl\bin\perl.exe c:\bin\dnsupdate-online.pl c:\bin\dnsupdate-settings.txt
StopProgram	The full path names of the following, in the order shown, separated by spaces: ■ The Perl script executable ■ The dnsupdate-offline script ■ The script settings file Example: c:\Program Files\Veritas\VRTSPerl\bin\perl.exe c:\bin\dnsupdate-offline.pl c:\bin\dnsupdate-settings.txt
MonitorProgram	The full path names of the following, in the order shown, separated by spaces: ■ The Perl script executable ■ The dnsupdate-monitor script ■ The script settings file Example: c:\Program Files\Veritas\VRTSPerl\bin\perl.exe c:\bin\dnsupdate-monitor.pl c:\bin\dnsupdate-settings.txt
UserName	The name of the user account to run the script. The account must have access and change rights to the DNS server.
Password	The password for the user account.
Domain	The domain name for that user account.

5 In the Add Resource dialog box, check **Enabled** and click **OK**.

6 In the Resource view, right-click the process resource you just created and click **Link**.

7 On the Link Resources dialog box, in the list of resources, select the name of the SQL Server resource and click **OK**.

8 In the Cluster Explorer window, click **File>Save Configuration**, and then click **File>Close Configuration**.

Example VCS configuration file entries (main.cf)

The following is an example of the configuration entries created for SQL Server in the VCS main.cf file as a result of adding the process resource for the web server update script.

```
group SPS-SQL_Grp (
    SystemList = { Primary-Sys1 = 0, Primary-Sys2 = 1 }
    )

    IP SPS-SQL_Grp-IP (
        Address = "192.168.0.1"
        SubNetMask = "255.255.255.0"
        MACAddress @Primary-Sys1 = "00-11-33-55-77-99"
        MACAddress @Primary-Sys2 = "00-22-44-66-77-00"
        )

    Lanman SPS-SQL_Grp-Lanman (
        VirtualName = SPSDB
        IPResName = SPS-SQL_Grp-IP
        ADUpdateRequired = 1
        DNSCriticalForOnline = 1
        DNSOptions = { UpdateAll, PurgeDuplicate }
        )

    MSSearch SPS-SQL_Grp-MSSearch (
        AppName = "SQLServer$SPSDB"
        )

    MountV SPS-SQL_Grp-MountV (
        MountPath = "L:"
        VolumeName = DG1_Vol1
        VMDGResName = SPS-SQL_Grp-VMDg
        )

    NIC SPS-SQL_Grp-NIC (
        MACAddress @Primary-Sys1 = "00-11-33-55-77-99"
        MACAddress @Primary-Sys2 = "00-22-44-66-77-00"
```

```
    )

RegRep SPS-SQL_Grp-RegRep-MSSQL (
    MountResName = SPS-SQL_Grp-MountV
    ReplicationDirectory = "\\RegRep\\SPS-SQL_Grp-RegRep-MSSQL"
    Keys = {
         "HKLM\\SOFTWARE\\Microsoft\\MSSQLServer
               \\Client" = "",
         "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
               \\SPSDB" = "" }
    ExcludeKeys = {
         "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
               \\SPSDB\\Setup",
         "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
               \\SPSDB\\SQLServerAgent\\Subsystems",
         "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
               \\SPSDB\\Tracking" }
    )

RegRep SPS-SQL_Grp-RegRep-MSSearch (
    MountResName = SPS-SQL_Grp-MountV
    ReplicationDirectory = "\\RegRep\\SPS-SQL_Grp-RegRep-MSSearch"
    Keys = {

         "HKLM\\Software\\Microsoft\\Search\\1.0\\Applications
               \\SQLServer$SPSDB" = "",

         "HKLM\\Software\\Microsoft\\Search\\1.0\\CatalogNames
               \\SQLServer$SPSDB" = "",

         "HKLM\\Software\\Microsoft\\Search\\1.0\\Databases
               \\SQLServer$SPSDB" = "",

         "HKLM\\Software\\Microsoft\\Search\\1.0\\Gather
               \\SQLServer$SPSDB" = "",

         "HKLM\\Software\\Microsoft\\Search\\1.0\\Gathering Manager
               \\Applications\\SQLServer$SPSDB" = "",

         "HKLM\\Software\\Microsoft\\Search\\1.0\\Indexer
               \\SQLServer$SPSDB" = "" }
    )
```

```
    SQLServer2000 SPS-SQL_Grp-SQLServer2000 (
        Instance = SPSDB
        LanmanResName = SPS-SQL_Grp-Lanman
        MountResName = SPS-SQL_Grp-MountV
        DetailMonitor = 1
        Username = myuser
        Domain = mydomain.com
        Password = my_encrypted_password
        SQLFile = "c:\\Program Files\\Veritas\\cluster
server\\bin\\SQLServer2000\\sample_script.sql"
        )

    RVGPrimary SPS-SQL_Grp-RVGPrimary (
        RvgResourceName = SQL-RVG
        )

    Process SPS-SQL_Grp-Process (
        StartProgram =
"C:\\Progra~1\\Veritas\\VRTSPerl\\bin\\perl.exe
C:\\Bin\\prod_single_dns.pl C:\\Bin\\settings.txt"
        StopProgram =
"C:\\Progra~1\\Veritas\\VRTSPerl\\bin\\perl.exe
C:\\Bin\\dnsupdate-offline.pl C:\\Bin\\settings.txt"
        MonitorProgram =
"C:\\Progra~1\\Veritas\\VRTSPerl\\bin\\perl.exe
C:\\Bin\\dnsupdate-monitor.pl C:\\Bin\\settings.txt"
        UserName = myuser
        Password = my_encrypted_password
        Domain = "mydomain.com"
        )

    SPS-SQL_Grp-IP requires SPS-SQL_Grp-NIC
    SPS-SQL_Grp-Lanman requires SPS-SQL_Grp-IP
    SPS-SQL_Grp-MSSearch requires SPS-SQL_Grp-RegRep-MSSearch
    SPS-SQL_Grp-MSSearch requires SPS-SQL_Grp-SQLServer2000
    SPS-SQL_Grp-MountV requires SPS-SQL_Grp-RVGPrimary
    SPS-SQL_Grp-RegRep-MSSQL requires SPS-SQL_Grp-MountV
    SPS-SQL_Grp-RegRep-MSSearch requires SPS-SQL_Grp-MountV
    SPS-SQL_Grp-SQLServer2000 requires SPS-SQL_Grp-MountV
    SPS-SQL_Grp-SQLServer2000 requires SPS-SQL_Grp-RegRep-MSSQL
    SPS-SQL_Grp-SQLServer2000 requires SPS-SQL_Grp-Lanman
    SPS-SQL_Grp-Process requires SPS-SQL_Grp-SQLServer2000
```

```
// resource dependency tree
//
//    group SPS-SQL_Grp
//    {
//    SPS-SQL_Grp-Process
//        {
//        MSSearch SPS-SQL_Grp-MSSearch
//            {
//            RegRep SPS-SQL_Grp-RegRep-MSSearch
//                {
//                MountV SPS-SQL_Grp-MountV
//                    {
//                    VMDg SPS-SQL_Grp-VMDg
//                    }
//                }
//            SQLServer2000 SPS-SQL_Grp-SQLServer2000
//                {
//                MountV SPS-SQL_Grp-MountV
//                    {
//                    VMDg SPS-SQL_Grp-VMDg
//                    }
//                RegRep SPS-SQL_Grp-RegRep-MSSQL
//                    {
//                    MountV SPS-SQL_Grp-MountV
//                        {
//                        RVGPrimary SPS-SQL_Grp-RVGPrimary
//                        }
//                    }
//                Lanman SPS-SQL_Grp-Lanman
//                    {
//                    IP SPS-SQL_Grp-IP
//                        {
//                        NIC SPS-SQL_Grp-NIC
//                        }
//                    }
//                }
//            }
//        }
 //    }
```

Requirements for using the script files

The DNS update script files are available in the following directory:

```
%VCS_HOME%\bin\SQLServer2008
```

To use the script files, customize the settings file for your environment. You need two copies of the settings file, one with settings for the primary site and one with settings for the secondary site.

See "Customizing the DNS update settings for the web servers" on page 39.

After customizing the settings file for each site, place the script files and the appropriate settings file for the site in a location where they are available from the cluster nodes. Since you specify the file names and locations as part of the service group process resource, you can choose the file names and locations. To avoid editing the service group again on the secondary site, you must use the same names and locations on both sites.

Warning: Do not place the settings file on a replicated volume. Otherwise, the active site's settings file would overwrite the passive site's settings file during replication.

In addition, the scripts require DNScmd.exe, which can be installed from the operating system Support Tools.

The scripts log to the engine log. The name of the log is engine_A.txt.

Customizing the DNS update settings for the web servers

You customize the settings file dnsupdate-settings.txt with the values required by the script used to update the DNS server. For each keyword (in brackets) you enter a value.

Table 2-3 describes the contents of the settings file.

Table 2-4 DNS update settings file

Keyword	Value	Notes
[web alias]	The web server (or NLB) name	Same in both setting files

Table 2-4 DNS update settings file *(continued)*

Keyword	Value	Notes
[local ip]	Comma delimited pair of IP addresses: IP address for the web server or NLB on this site, IP address for the DNS server to be updated Example: 192.168.1.2, 192.168.10.10	When editing the primary site settings file, the local IP is that of the primary site web server or NLB. For the secondary site file, the local IP is that of the secondary site web server or NLB. If you have additional IP addresses for additional web servers or DNS servers, enter them as a comma delimited pair on separate lines.
[remote ip]	Comma delimited pair of IP addresses: IP address for the web server or NLB on the remote site, IP address of the DNS server to be updated Example: 192.168.1.1, 192.168.10.10	When editing the primary site settings file, the remote IP is that of the secondary site web server or NLB. For the secondary site file, the remote IP is that of the primary site web server or NLB. The DNS server to be updated is the one that manages the IP address for the web server or NLB. If you have additional IP addresses for additional web servers or DNS servers, enter them as a comma delimited pair on separate lines.
[dns command]	Path to the location of DNScmd.exe Example: \Program Files\Support Tools	By default, the script will look for DNScmd.exe in \Program Files\Support Tools on the drive where SFW HA is installed, unless you specify another value.
[domain name]	Fully qualified domain of the web server Example: symantecdomain.com	Same in both settings files
[nslookup command]	Full path for nslookup.exe Example: \Windows\System32\nslookup.exe	By default, the script will look for nslookup.exe on the drive where SFW HA is installed in the default directory shown, unless you specify another value.

Configuring a resource for the web servers

You can add a process resource to the SQL Server service group to enable switching to the web servers at the site where the SQL Server service group is brought online. The process resource executes a Perl script to update the DNS server IP address for the web servers.

You add the process resource after you create the service group on the primary site. After you create the service group on the secondary site, you add the process resource to that service group as well.

The procedure shows how to add a resource using the Java Console. You can also use other methods, as described in the VCS documentation.

See *Veritas Cluster Server Administrator's Guide*.

Verify that the Perl executable, the scripts, and the customized settings file is available from the systems on which the service group is configured.

In addition, ensure that DNScmd.exe is installed from the operating system Support Tools to the same drive as the SFW HA application.

To configure a resource for the web servers

1. Start the Cluster Manager Java Console, log on to the cluster, and open the Cluster Explorer window (click anywhere in the active Cluster Monitor panel).
2. In the Cluster Explorer configuration tree, right-click the name of the SQL service group and click **Add Resource**. If prompted to switch to read-write mode, click **Yes**.
3. In the Add Resource dialog box, specify a name for the resource and in the Resource Type list, click **Process**.
4. Edit the following process resource attributes:

StartProgram	The full path names of the following, in the order shown, separated by spaces: ■ The Perl script executable ■ The dnsupdate-online script ■ The script settings file Example: c:\Program Files\Veritas\VRTSPerl\bin\perl.exe c:\bin\dnsupdate-online.pl c:\bin\dnsupdate-settings.txt

StopProgram	The full path names of the following, in the order shown, separated by spaces: ■ The Perl script executable ■ The dnsupdate-offline script ■ The script settings file Example: c:\Program Files\Veritas\VRTSPerl\bin\perl.exe c:\bin\dnsupdate-offline.pl c:\bin\dnsupdate-settings.txt
MonitorProgram	The full path names of the following, in the order shown, separated by spaces: ■ The Perl script executable ■ The dnsupdate-monitor script ■ The script settings file Example: c:\Program Files\Veritas\VRTSPerl\bin\perl.exe c:\bin\dnsupdate-monitor.pl c:\bin\dnsupdate-settings.txt
UserName	The name of the user account to run the script. The account must have access and change rights to the DNS server.
Password	The password for the user account.
Domain	The domain name for that user account.

5 In the Add Resource dialog box, check **Enabled** and click **OK**.

6 In the Resource view, right-click the process resource you just created and click **Link**.

7 On the Link Resources dialog box, in the list of resources, select the name of the SQL Server resource and click **OK**.

8 In the Cluster Explorer window, click **File>Save Configuration**, and then click **File>Close Configuration**.

Example VCS configuration file entries (main.cf)

The following is an example of the configuration entries created for SQL Server in the VCS main.cf file as a result of adding the process resource for the web server update script.

```
group SPS-SQL_Grp (
    SystemList = { Primary-Sys1 = 0, Primary-Sys2 = 1 }
    )

    IP SPS-SQL_Grp-IP (
        Address = "192.168.0.1"
        SubNetMask = "255.255.255.0"
        MACAddress @Primary-Sys1 = "00-11-33-55-77-99"
        MACAddress @Primary-Sys2 = "00-22-44-66-77-00"
        )

    Lanman SPS-SQL_Grp-Lanman (
        VirtualName = SPSDB
        IPResName = SPS-SQL_Grp-IP
        ADUpdateRequired = 1
        DNSCriticalForOnline = 1
        DNSOptions = { UpdateAll, PurgeDuplicate }
        )

    MSSearch SPS-SQL_Grp-MSSearch (
        AppName = "SQLServer$SPSDB"
        )

    MountV SPS-SQL_Grp-MountV (
        MountPath = "L:"
        VolumeName = DG1_Vol1
        VMDGResName = SPS-SQL_Grp-VMDg
        )

    NIC SPS-SQL_Grp-NIC (
        MACAddress @Primary-Sys1 = "00-11-33-55-77-99"
        MACAddress @Primary-Sys2 = "00-22-44-66-77-00"
        )

    RegRep SPS-SQL_Grp-RegRep-MSSQL (
        MountResName = SPS-SQL_Grp-MountV
        ReplicationDirectory = "\\RegRep\\SPS-SQL_Grp-RegRep-MSSQL"
        Keys = {
             "HKLM\\SOFTWARE\\Microsoft\\MSSQLServer
                   \\Client" = "",
             "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
                   \\SPSDB" = "" }
        ExcludeKeys = {
```

```
                    "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
                          \\SPSDB\\Setup",
                    "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
                          \\SPSDB\\SQLServerAgent\\Subsystems",
                    "HKLM\\SOFTWARE\\Microsoft\\Microsoft SQL Server
                          \\SPSDB\\Tracking" }
               )

          RegRep SPS-SQL_Grp-RegRep-MSSearch (
               MountResName = SPS-SQL_Grp-MountV
               ReplicationDirectory = "\\RegRep\\SPS-SQL_Grp-RegRep-MSSearch"
               Keys = {

                    "HKLM\\Software\\Microsoft\\Search\\1.0\\Applications
                          \\SQLServer$SPSDB" = "",

                    "HKLM\\Software\\Microsoft\\Search\\1.0\\CatalogNames
                          \\SQLServer$SPSDB" = "",

                    "HKLM\\Software\\Microsoft\\Search\\1.0\\Databases
                          \\SQLServer$SPSDB" = "",

                    "HKLM\\Software\\Microsoft\\Search\\1.0\\Gather
                          \\SQLServer$SPSDB" = "",

                    "HKLM\\Software\\Microsoft\\Search\\1.0\\Gathering Manager
                          \\Applications\\SQLServer$SPSDB" = "",

                    "HKLM\\Software\\Microsoft\\Search\\1.0\\Indexer
                          \\SQLServer$SPSDB" = "" }
               )

          SQLServer2000 SPS-SQL_Grp-SQLServer2000 (
               Instance = SPSDB
               LanmanResName = SPS-SQL_Grp-Lanman
               MountResName = SPS-SQL_Grp-MountV
               DetailMonitor = 1
               Username = myuser
               Domain = mydomain.com
               Password = my_encrypted_password
               SQLFile = "c:\\Program Files\\Veritas\\cluster
server\\bin\\SQLServer2000\\sample_script.sql"
               )
```

```
    RVGPrimary SPS-SQL_Grp-RVGPrimary (
        RvgResourceName = SQL-RVG
        )

    Process SPS-SQL_Grp-Process (
        StartProgram =
"C:\\Progra~1\\Veritas\\VRTSPerl\\bin\\perl.exe
C:\\Bin\\prod_single_dns.pl C:\\Bin\\settings.txt"
        StopProgram =
"C:\\Progra~1\\Veritas\\VRTSPerl\\bin\\perl.exe
C:\\Bin\\dnsupdate-offline.pl C:\\Bin\\settings.txt"
        MonitorProgram =
"C:\\Progra~1\\Veritas\\VRTSPerl\\bin\\perl.exe
C:\\Bin\\dnsupdate-monitor.pl C:\\Bin\\settings.txt"
        UserName = myuser
        Password = my_encrypted_password
        Domain = "mydomain.com"
        )

    SPS-SQL_Grp-IP requires SPS-SQL_Grp-NIC
    SPS-SQL_Grp-Lanman requires SPS-SQL_Grp-IP
    SPS-SQL_Grp-MSSearch requires SPS-SQL_Grp-RegRep-MSSearch
    SPS-SQL_Grp-MSSearch requires SPS-SQL_Grp-SQLServer2000
    SPS-SQL_Grp-MountV requires SPS-SQL_Grp-RVGPrimary
    SPS-SQL_Grp-RegRep-MSSQL requires SPS-SQL_Grp-MountV
    SPS-SQL_Grp-RegRep-MSSearch requires SPS-SQL_Grp-MountV
    SPS-SQL_Grp-SQLServer2000 requires SPS-SQL_Grp-MountV
    SPS-SQL_Grp-SQLServer2000 requires SPS-SQL_Grp-RegRep-MSSQL
    SPS-SQL_Grp-SQLServer2000 requires SPS-SQL_Grp-Lanman
    SPS-SQL_Grp-Process requires SPS-SQL_Grp-SQLServer2000

    // resource dependency tree
    //
    //    group SPS-SQL_Grp
    //    {
    //    SPS-SQL_Grp-Process
    //        {
    //        MSSearch SPS-SQL_Grp-MSSearch
    //            {
    //            RegRep SPS-SQL_Grp-RegRep-MSSearch
    //                {
    //                MountV SPS-SQL_Grp-MountV
```

```
//                      {
//                      VMDg SPS-SQL_Grp-VMDg
//                      }
//                  }
//              SQLServer2000 SPS-SQL_Grp-SQLServer2000
//                  {
//                  MountV SPS-SQL_Grp-MountV
//                      {
//                      VMDg SPS-SQL_Grp-VMDg
//                      }
//                  RegRep SPS-SQL_Grp-RegRep-MSSQL
//                      {
//                      MountV SPS-SQL_Grp-MountV
//                          {
//                          RVGPrimary SPS-SQL_Grp-RVGPrimary
//                          }
//                      }
//                  Lanman SPS-SQL_Grp-Lanman
//                      {
//                      IP SPS-SQL_Grp-IP
//                          {
//                          NIC SPS-SQL_Grp-NIC
//                          }
//                      }
//                  }
//              }
//          }
 //     }
```